Carnegie Mellon University

From the Selected Works of Adam Hodges

2017

Photo Sharing in the Arab Gulf: Expressing the Collective and Autonomous Selves

Norah Abokhodair, *University of Washington*
Adam Hodges
Sarah Vieweg, *Qatar Computing Research Institute*

Available at: https://works.bepress.com/adamhodges/68/
Photo Sharing in the Arab Gulf: Expressing the Collective and Autonomous Selves

Norah Abokhodair  
University of Washington  
Seattle, USA  
noraha@uw.edu

Adam Hodges  
Carnegie Mellon University  
Doha, Qatar  
adamhodges@cmu.edu

Sarah Vieweg*  
Qatar Computing Research Institute  
Doha, Qatar  
sarahvieweg@gmail.com

ABSTRACT

Current research demonstrates that when people engage in social photo sharing, they are mindful of how audiences perceive and interact with their photos. We extend this vein of inquiry to focus on photo sharing in the context of the Arab Gulf. We provide insight into how this activity is practiced in a region governed by strict adherence to cultural norms and Islamic traditions that dictate how to “appropriately” share content in digital settings. In particular, we look at the relationship between photo sharing and its effects on identity and self-presentation. To understand how Saudi and Qatari participants represent themselves through photo sharing applications, we conducted 42 face-to-face interviews. Our results reveal that Arab Gulf users engage in photo sharing practices that construct a collective self, distinct from an autonomous self. This collective self often trumps the autonomous self in shaping photo sharing practices.

Author Keywords  
Cultural values; Identity; Islam; Photo Sharing; Privacy; Qatar; Saudi Arabia; Self-presentation; Social Media; Social Computing; Culturally-sensitive Design.

ACM Classification Keywords  
K.4 Computers and Society

INTRODUCTION AND MOTIVATION

Interviewer: How do you present yourself online?

Layla: My profile picture was a picture of a flower and my name wasn’t my real name it was a fake name…and then I realized why do I have this double identity. Why do I do this to myself? Why not be one person all over the world… I really realized why do I have this double identity. Why do I do this? Why not be one person all over the world… I really realized why do I have this double identity. Why do I do this to myself? Why not be one person all over the world… I really cannot share many things. Like I cannot share my picture looking like this (without hijab) because I am expected to cover my hair and I don’t, and if I do share pictures looking like this that would affect my own personal safety.

Presenting oneself, constructing identity, and communicating through photos is becoming a prominent means of socializing and connecting with others in digital environments. Take for example the rise of services like Snapchat, through which users can share spontaneous moments in real time relatively safely without fear of images being permanently saved and later shared. However, we have little knowledge of the decision-making process behind photo sharing, the user and audience perceptions of these shared photos, and how self-presentation is understood through the shared content.

The CSCW community has been long interested in research on the notion of identity, self-presentation and impression management on social networking sites—many of these platforms are treated as “online repositories of digital self-presentation” [43]. In this line of research many studies offer insight into how users employ various methods aimed at impression management, or how they construct a “digital image.” Some of these techniques include the acquisition and management of multiple accounts on the same platform that reflect different personas on social media, maintaining accounts on different social media platforms for different audiences and purposes (e.g., having an account on Twitter for professional posts, and on Facebook for socializing), the use of pseudonyms, and managing boundaries between friends and family circles and the shared information [17,44,46,47].

In earlier research we provide insight into how users from the Arab Gulf perceive privacy on social networking sites [1,2,67]. We note that this population shows high levels of concern regarding the privacy of shared content on social media due to the severity of the consequences for their reputation if missteps take place. Additionally, we note that challenges in expressing identity among populations that share collectivist, relationship-based cultural values surface in social media practices.

In addition, we found that users actively manage their profiles through privacy settings to make sure that no personal content is shared beyond the intended audience due to the far reaching consequences of slippage from one
context to another. For Arab Gulf users, the treatment of social media accounts as an extension of one’s self requires extra care in protecting the sanctity of the shared content, such as personal information and photos that contain or reveal content that is considered intimate (known as awra in Arabic), and which should not be disclosed in public—be it parts of the body, personally revealing behaviors, or innermost thoughts [1].

Our current research sought to understand how Arab Muslim young people construct and form identity online through social photo sharing applications. In this paper, we pay special attention to how participants express their photo and video sharing practices. We aim to understand how digital self-presentation through photo sharing technologies takes place in an environment specific to the Arab Gulf where an individual is engaged in a strong, coherent relationship with the collective (i.e. the family, the tribe, the government) [8,9,12,32,67,70].

We engage with young adults from the Arab Gulf for two reasons. First, young Saudis and Qataris have a high adoption rate for photo-sharing applications. Saudi Arabia ranks seventh globally in terms of individual accounts on social media, with an average of seven accounts on different platforms per person [55]. In addition, it ranks eighth in terms of using Snapchat. Instagram adoption and use is also high in Saudi Arabia as it ranks fifth on the list of highly active countries in the world. Similarly, in Qatar, social media are popular and widely used among the native population: 39% of Qataris use Snapchat, 65% use Instagram, 44% are on Facebook, and 46% use Twitter [58,59]. Second, youth in the Arab Gulf play a prominent role in the highly anticipated reforms happening in the region due to their demographic prominence. 54% of the population in the GCC2 is under the age of 25 [62]. This growth is expected to bring upon change and transform the ultra-conservative region [36,52,53], especially among the digital youth [38].

We undertake this work in recognition of the lack of research that considers Arab Muslim populations’ photo sharing practices, specifically in the GCC region. We seek to enrich the conversation regarding photo sharing, technology use and design by incorporating an additional perspective—that of citizens of Arab Gulf countries. We ask questions with the intent to eventually offer design principles and inspiration that will guide technology designers and practitioners toward the creation of culturally-sensitive and culturally-inclusive technologies.

We draw on data from 42 face-to-face interviews with Saudi and Qatari participants. The broad questions we ask are: 1) Are there culturally or regionally-specific ways in which Gulf Arabs use photo sharing applications for self-presentation? 2) Given the significance placed on gender segregation [1,8,9] in everyday situations, does gender play a role in photo sharing practices? 3) How are cultural and religious values conceptualized in the use of photo sharing applications in this region?

We began with an open-ended approach that involves broad, high-level questions regarding the use of social media in the context of the GCC [1,2,67]. As we spoke with more people, we settled on the realization that photos—while popular and integral to the daily lives of digital technology users in the GCC—were also the source of much contemplation and stress. Citizens of the GCC often find themselves under pressure to carefully navigate social media applications that offer photo sharing, such as Facebook, Instagram, Path, Twitter, and Snapchat. For example, in an earlier study [2], discussions regarding the protection of profile pictures from misuse was a common topic when people discussed privacy on Twitter. We continue building on our earlier results by conducting a more focused study to qualitatively investigate digital identity construction and management through social photo sharing technologies, which participants undertake to achieve traditional, Islamic, and familial expectations.

BACKGROUND
Before we delve into the details of our current study, we provide a brief overview of relevant research in two areas. First, we discuss the journey from physical to digital photo sharing. Second, we review the literature on self-presentation on mobile photo sharing with a focus on the two most popular image-based applications in the GCC: Snapchat and Instagram.

From Physical to Digital Photo Sharing
Research in CSCW has explored how people share and collaborate with paper-based (physical) photos [21,25]. This work focuses mainly on developing technologies to support and improve methods for people to share photos across long distances (e.g., between family living abroad). This research in one way or another contributed to the development of online sharing websites (e.g., Flickr), which have been a common topic of focus in subsequent research.

Early research on web-based photo sharing began by exploring behaviors and expectations associated with the nascent practice of sharing one’s photos in a digital environment [3,35,39,42,49,50]. The increased possibilities for taking and sharing photos spawned a number of questions [35,42]; this research showed that factors influencing photo-sharing behavior included privacy concerns, ability to engage and interact with photos, and platform affordances. This technological advancement influenced the ways photography—whether a hobby or a job—is perceived and practiced.

One of the early studies is the seminal work by Miller [49], in which he examines web-based photo sharing practices on
Flickr—at the time it was an emerging platform that generated much buzz—by interviewing people who switched to digital photography. Miller found that people are divided into two categories that describe their photo taking and sharing behaviors: The Kodak Culture people and The Snaprs.

The Kodak Culture photo sharers engage in photo taking activities centered on specific occasions (e.g., traveling, holidays) with the intention of using Flickr as a platform to archive rather than share. In addition, the photos are mostly uncaptioned as people within this category prefer to verbally communicate knowledge about the photo. In the second group, The Snaprs, people tend to take more ‘arty’ shots and use the platform as a method to share their photos with others in the Flickr community who might offer comments to help them improve their photography skills.

In terms of privacy concerns, which is central to Miller’s study, people within the Kodak Culture group tend to express more privacy concerns regarding sharing personal moments on Flickr in comparison to people from The Snaprs group. Although his study addresses early practices of photo sharing, privacy issues and audience management continue to be prominent concerns that appear in current research on digital photo sharing. Our earlier work revealed several privacy concerns and practices (e.g., managing audience; creating multiple accounts for different personas) that are closely related to managing online identity and audience expectation [1,2,67].

Self-Presentation on Mobile Photo Sharing Applications
The CSCW community has long been interested in understanding practices of self-presentation and impression management on popular social networking sites. Hogan [33] observes that much of the literature on social media builds on Goffman’s theories of identity and self-presentation, “front stage” and “back stage” presentations, with a focus on contexts and audiences. Yet little qualitative research has been done on the influence of religion and cultural traditions on self-presentation online. Our study begins to address this gap; we set out to understand these influences vis-à-vis online self-presentation. But first, we review the literature on identity management and self-presentation via digital media, with a focus on mobile photo sharing applications.

People exchange photo and video messages to communicate, share, and record memories. Much of the research on photo sharing has focused on the dynamics around photo sharing with less focus on the meaning of photos for those who share and take them. A recent study conducted by the PEW Research Center reveals that more than half of Internet users share photos and videos [40,41]. In addition, they found that the rise of smartphones and mobile sharing applications—such as Snapchat and Instagram—are one of the reasons fueling this phenomenon. In 2015, Facebook, Instagram, and Snapchat consecutively ranked as the most widely used social media platforms by teens in the U.S. [40]. These applications rank high in the GCC as well, as noted earlier.

The rapid growth and fast adoption of both applications has spawned a small but burgeoning collection of academic research [e.g.,14,15,20,37,57,60,66,68]. Results show that for a majority of users, knowing whether the content will live on the Internet forever or “self-destruct” seems to play a role in how they use Snapchat versus Instagram or other types of photo sharing applications [15,60]. In one of the latest studies on Snapchat by Bayer and colleagues [15], the authors sought to understand the perception of Snapchat among college students. They found that socializing through ephemeral content is seen as more enjoyable than other forms of communication, with fewer concerns regarding self-presentation.

A study by Charteris [20] delves into the complexities of youth cultural practices and self-presentation on Snapchat, with a focus on Australia. The authors build on Goffman’s notion of underlife—“[t]he range of activities people develop to distance themselves from expected norms.” The authors conclude that young people are using ephemeral media “to constitute agentic discursive identities” and that studying this process might provide useful information about self-presentation.

Identity formation undergoes constant change, experimentation and exploration [17,18,22,27,30,45]. In digital environments in particular, safety and trust are among the values that can assure a successful experience [17,30]. Scholarly research has investigated ways different users create and navigate identity through contemporary mobile applications (e.g., American youth [17,27], American homeless youth [69], transgender adults [30]). In terms of photo sharing and emotional support, an exploratory study by Andalibi et al. [13] seeks to understand the role of photo sharing applications in the lives of people suffering from depression. They examine depression-related images on Instagram and their captions to suggest design principles that engage this population. Another study by Haimson et al. [30] focuses on examining how people undergoing gender transition use photo sharing applications to construct personal style and imagine a future self. The authors conclude that close friends and anonymous strangers are the two important groups who offer a safe and comfortable environment for identity exploration.

Safety, trust and comfort are important for those who wish to explore and experiment with identity. Our current research focuses on these values as they relate to the challenges faced by GCC users. Our goal is to understand the cultural dimensions of photo sharing and its relationship to self-presentation, and the affordances Instagram and Snapchat provide as this population manages and shapes identities. We aim to extend the discussion of self-presentation offered in [20] by providing a nuanced, qualitative inquiry that focuses on a conservative Muslim population.
STUDY CONTEXT: CONTEMPORARY GCC CULTURAL VALUES

Our participants are citizens of Saudi Arabia and Qatar. In interviews, we pay special attention to photo sharing practices with an interest in understanding how traditional values shape the use of these technologies that are not necessarily designed with the cultural norms and expectations prevalent in the Arab Gulf in mind.

Saudi Arabia is geographically the second-largest state in the Arab world and the largest of the GCC countries, and Qatar is a small peninsula connected to Saudi Arabia, which juts into the Gulf. In both countries, the majority of the population is Sunni Muslim. Islam is the driving factor that influences behavior, institutional policies, and social practices. The Quran and the Hadith (the sayings and example of the prophet Mohammad) are central sources from which citizens draw inspiration and knowledge regarding acceptable conduct and actions.

Photography Rules and Laws in the GCC

Tasweer (photography making, taking and printing) has been a topic of discussion among Muslim clerics for many years [7,10]. The discussion primarily focuses on rules surrounding taking photos of living creatures (e.g., people, animals) and using them in official documents (e.g., passports). Conservative branches of Islam, such as Wahhabism, consider all forms of photography to be haram (prohibited) [7,10]. Wahhabism is widely practiced in the GCC region, and is responsible for many of the laws, customs and practices of its citizens. However, most interpretations of Islam only focus on the prohibition of drawing rather than photography, as drawing is considered a recreation of a living soul, which is conceived as only a divine ability.

How Muslim clerics and scholars perceive photography is important for this region due to the enforcement of Sharia Law. As guardians of Islamic knowledge, Muslim scholars play a vital role in enforcing the law. For example, Muslims are encouraged not to keep pictures of animated beings in the home; it is believed they will prevent reception of God’s blessing. In addition, it is not uncommon to visit a Muslim home and not find art or decorative objects of living creatures, again, because they may be considered recreations of live beings. However, over time and with the increased need for security, clerics and scholars have revised rules to permit photos of people for official, state-sanctioned reasons.

Yet even with photo usage allowed for passports and photo IDs, the situation is further complicated by concerns over the risk of women’s photos being viewed by men who are not considered mahrams—men who are blood related and are considered unmarriageable kin. Therefore, in many GCC countries, there is always an option for women to interact only with other women when documents must be viewed.

Another concern in the region deals with street or public photography. In Saudi and Qatar, it is taboo to take photos of women in public, of construction sites, of government projects and offices, and inside malls [26,28,71]. These norms protect the right to privacy in public spaces. In 2007, Saudi Arabia introduced the cybercrime law, which included a penalty of up to one year of imprisonment or a fine not to exceed SR500,000 (~$130K) for anyone using a cell phone or a camera to take a taboo picture and post it on social media. A similar law is in place in other GCC countries [4,54]. Regulations state that it is necessary to seek permission from the people who might appear in a photo before snapping, especially women, because “there are conservative families who don’t want to see the photos of their daughters in newspapers, let alone the Internet.” And the sharing of these photos can “bring a lot of harm to women, even if the picture shows only a partial view of her [28].”

Given these rules and norms in the region surrounding photography, photo sharing among Gulf residents is an ongoing topic of discussion amongst religious clerics, the government, and the general public. These conversations influence the use and adoption of social media photo sharing applications in the region.

An additional concern surrounding photo sharing applications is the threat (perceived or real) of using photos as blackmail. In Saudi Arabia, the Saudi Committee for the Promotion of Virtue and the Prevention of Vice dealt with 1,834 incidents of women being blackmailed by men in 2014 (of those 57% were initiated using ICTs) [5]. Blackmailing typically involves threatening to share women’s photos in public in return for sex or money. It is worth noting that in many cases the photos are not “sexual in nature” and might only “reveal some skin, taken for example at wedding parties, or show them in mixed gender gatherings, or engaging in other acts that are not religiously and socially acceptable” [5]. This issue influences women’s attitude toward the taking and sharing of their photos in online settings [5,8].

Family relationships in the Muslim household

Islam places great importance on blood ties and family relations (silat ur-rahm in Arabic). This value includes maintaining a good relationship with one’s relatives, to love, respect and help them. The importance of this value has generated a society that is highly collectivist in nature [5,9,11,12]. It is common to pay regular visits to family and extended family members in the Arab Gulf. In some cases, larger families (multiple siblings who have their own families) live in what is called a “family compound” if the father’s financial situation permits [63]. Muslims are warned against the severing of these kinship ties in many verses of the Quran; it is considered sinful if they do.

Another Islamic value that guides family life is bir al walidayn (kindness and respect toward parents). Children are obligated to obey, respect and care for their parents as they grow old; one is never out from under the authority of one’s parents. Similarly, parents are obligated to take care of their
children, to protect them from harm, and to provide them with a good life. Guarding children from harm to their reputation and honor ranks as highly as protecting them from physical harm [8].

These values are prevalent in the region and dictate familial relationships. The opinion of family members and relatives regarding how one presents oneself in digital environments is taken into account because of the reciprocal effect on both the individual and their family if any harm or shame should occur.

Cultural practices in the GCC

Saudis and Qatars aggregate toward the collectivist end of Hall’s [31] collectivist/individualist continuum, favoring relationship-based cultural practices that emphasize and value strong, cohesive, long-term relationships [32,34]. While the cultural practices widely adopted in these countries share many commonalities, these are relative tendencies and not absolute formulae for acting. Like any region of the world, the Arab Gulf region is not a monolith. The practices we describe should not be taken as a homogenous representation of a static “culture” without internal variation. Nor should they be judged against some idealized—and all-too-often exotified—narrative of a “traditional culture” that can be cleanly separated from the “modern” world. As widely recognized by anthropologists, to talk of “a culture” as a noun is grossly misleading, risking to oversimplify the dynamic cultural processes that guide the ways individuals and groups interact.

In our description of our participants’ photo sharing practices, we wish to avoid essentializing those practices as representing a static, homogenous, and monolithic “culture.” Rather, we wish to underscore the dynamic (and not always fully consistent) tactics adopted by our participants as they negotiate ways to share photos in light of the mores and norms into which they have been largely socialized as members of societies that value religious traditions and familial, relationship-based structures. It is not that such values are absent from societies, such as the U.S., that engage in more individualistic, rules-based cultural practices; it is just that they are not prevalent to the same degree, making it difficult for those operating with differing cultural assumptions to fully recognize and understand the import and significance of our Gulf Arab participants’ practices and choices [31,32,34]. We therefore aim to contribute a greater understanding of the collectivist orientation that guides photo sharing practices among Arab Gulf users, which holds particular import for designers of these technologies that may live in different cultural contexts and operate with different cultural assumptions about individual autonomy.

Differences within the GCC

To an outsider, the GCC may seem homogeneous, but to an insider there are clear differences between the GCC countries and the regions within each country, which affects the pervasiveness of conservative or liberal undercurrents. In the Arab Gulf context, conservative implies the extent to which one adheres to and observes religious rules and national cultural traditions. On the other hand, liberalism (often used in conjunction with modernity) is frequently associated with “the West,” in general, and specifically with the U.S. Within the same household, people often have different views. A husband may be more conservative than his wife, or a brother more liberal than his sister, while all living under the same roof [70].

Part of the reason for regional differences across the GCC is that historically people of this region adhered strongly to tribal allegiances (more so than today) or immigrated from other countries (especially along the coasts) with different ideas and views. The tribal and clan bloodlines carry rich legacies that differ greatly from each other when it comes to how strictly traditional norms and Sharia law is interpreted and enacted. For example, in Saudi Arabia, the city of Jeddah—which has a population of about three million people—is known to be a liberal, open-minded enclave in which people can openly express themselves. For instance, women have fewer wardrobe restrictions, and gender segregation is less strict by Saudi Arabian standards, which is largely due to the cosmopolitan nature of the city, being the main international gateway to the Muslim holy city of Mecca. Contrast this with Riyadh, the capital of Saudi and the center of the Arabian Peninsula, which is a highly conservative city where religious police regularly discipline people for slight infractions [64].

THEORETICAL FRAMEWORK & RESEARCHER STANCE

“Thinking with” Participants

Our review of relevant literature reveals that the research to date has focused mostly on users from the United States or Western Europe. In addition, we speculate that these photo-sharing technologies are aimed primarily at a user group that adheres to cultural norms that fall outside the purview of conservative Muslim societies. In this paper, we aim to broaden understandings of our Gulf Arab participants’ use of photo sharing applications.

Our theoretical approach is inspired by feminist perspectives on knowledge creation. In particular, we draw from the “situated character of knowledge” [16], which allows us to present our findings and subsequent conclusions as intersubjectively-created “layers of meaning” derived from our empirically-based data analysis. Influenced by the insights we gained from our data and our participants, we have a responsibility to report on our participants’ experiences with social media through a process of “thinking with” them as we arrive at an explanation of the situated processes they describe while they participate in photo sharing in digital spaces. Because we are working with a population that is often under great scrutiny from a “Western” perspective (e.g. people from conservative Muslim societies are frequently viewed as oppressed, uneducated and/or hindered in any number of ways), it is incumbent upon us to allow the data to “speak” without any preconceived notions of how this population should interact.
with, or perceive, photo sharing. Instead, it is our responsibility to provide a vision of the practice of photo sharing as it is articulated and experienced by a lesser-studied population of users; in this case, Gulf Arabs.

**Photo Sharing and Presentation of the Self**

Photo sharing on social media goes well beyond engagement with and reactions to photos. Photo sharing is also implicated in the construction of identities as users navigate multiple contexts and position themselves in contextually appropriate ways for different audiences [1,2,46]. As Farnham and Churchill [24] emphasize, “people’s lives are ‘faceted’; that is, people maintain social boundaries and show different facets” depending on the situation. For this reason, the authors warn against assuming a singular identity for any given user of social media.

Research on identity and social networking sites has helped explain the motives and behaviors of sharing, and also resulted in various conceptual models of identity ([65] in [19]). However, this body of literature has been mainly limited to two dimensions of identity: 1) identity through self-ascription (i.e. the content individuals share about themselves) [17,27,29]; and 2) identity through other-ascription (i.e., what others share about the individual) [17,43,46,47]. Importantly, constant across both dimensions is a view of the individual as a discrete and autonomous agent that can be cleanly separated from other individuals who are themselves discrete and autonomous agents. Although these individuals may aggregate into groups and share a group identity, it is typically assumed that they act with egocentric motivations.

In “thinking with” our interview participants, however, it became clear to us that this notion of identity in relation to what we will call the autonomous self rests on ideologies of the individual that are far from universal. Rather, the focus on the autonomous self as the central organizing unit for understanding “the presentation of the self in everyday life” [29] fails to understand the way those with collectivist cultural orientations understand the self and the self’s relation to the larger collective. In this paper, we therefore propose contrasting the notion of the autonomous self with what we will call the collective self. By using the term autonomous self, we wish to underscore that facet of the self that is primarily concerned with egocentric representation—that is, where the individual is concerned with merely representing oneself as a discrete subject conceived of and positioned as separate and independent of a larger collective unit. This contrasts with what we term the collective self, which is that facet of the self where the individual is but an appendage of a larger collective and must act with that collective’s representational needs at the forefront of concern.

Identities—whether we speak of them in face-to-face or digital settings—in the context of the Arab Gulf are constructed such that the “individual” is not a discrete and autonomous subject. The “individual” is inseparably part of a collective that is itself part and parcel of another larger collective (see Figure 1). Moreover, as Hooker [34] explains, “The principle is not simply that loyalty to the group entitles one to loyalty from the group. … Neglecting other members of the group is like neglecting parts of one’s body.” In other words, the type of egocentric orientation common among, say, Americans is typically superseded by a group-centered orientation so that the central organizing principle for many individual actions are the face needs of the group.

Among our participants, the individuals and the collectives of which they are part are bound by what society expects in conformance with Islamic law. Autonomy, or any notion of individual agency, is perceived in relation to how an individual’s actions impact the group. Take for example the value of family honor, or a’ardth as it is referred to in Arabic. A’ardth is a collective trait ascribed to the group as a whole, but it is achieved and accumulated through the actions taken by individual members of that group. If a a’ardth is damaged by an individual, it affects the entire family. Therefore, when sharing photos, emphasis is placed on presenting and managing the collective self rather than simply presenting and managing an autonomous self.

**Figure 1: The hierarchy of belonging in a collectivist/relationship-based cultural orientation**

**THE STUDY**

In this section, we describe our recruitment process, provide an overview of our participants, and explain the methods we used for data collection and analysis.

**Participants**

The first author interviewed participants from Saudi Arabia, and the third author interviewed participants from Qatar. Both recruited through personal and professional connections, and these participants in turn helped recruit more participants (i.e. snowball method). In addition, a Facebook advertisement was posted on a group for Saudis studying abroad that the first author was affiliated with. Our primary goal was to find people willing to speak about personal topics, which can be challenging in the GCC. We do not claim that our participants are reflective of the entire population of either country nor the region; they represent a particular sector that are educated, open to speaking face-to-face about private subjects, and willing to be audio recorded.

We interviewed 42 participants (M=15, F=27) between 18-38 years old; most are bilingual in Arabic and English. This
is not uncommon in the region, as English is considered an important lingua franca in the GCC, especially for educational and professional development. Our aim in this interpretive, qualitative study is not to generalize the results to the entire GCC population. Instead, our goal is to reach a point at which we can responsibly and confidently say that we are able to apply our findings based on “…a thorough specification of the characteristics of the sample” [23].

Interviews did not focus only on Saudis in Saudi Arabia and Qataris in Qatar; we also spoke with participants who live(d) abroad. We consider this group “The Wild Cards” [53] in our analysis, due to the significance of their experience in explaining how they use photo sharing applications. This particular subsection of our population use sharing applications in two different contexts (USA and GCC) and face daily challenges regarding how to manage identity and expectations within each.

Methods
The first and third authors recruited Saudi and Qatari participants, and engaged in conversational interviews, also known as ethnographically informed interviewing. This type of interviewing offered us flexibility in the flow of questions, and provided a space for our participants to feel free to share in-depth accounts of their experiences. When conducting this type of interview, it is also expected that “interview questions will change over time, and each new interview builds on those already done, expanding information that was picked up previously, moving in new directions, and seeking elucidations and elaborations from various participants” [56].

Interviews
Living and experiencing daily interactions first hand as researchers in the region gives us insight into the nuances and complexity of the cultural practices in each of these countries. The first author is from Saudi Arabia and conducted most of her interviews in Saudi between September 2015 and April 2016. She interviewed both men and women (M=11, F=16). Interviews were mostly conducted in English with some Arabic interspersed. Code-switching did occur, but English remained the language that was primarily spoken.3

The third author is neither Arabic speaking nor from the region. She identifies as American, and has lived and worked in Qatar for several years. She conducted interviews in Qatar with both men and women between January 2015 and April 2016 (M=4, F=11).

The third author found that based on her status as an “outsider,” Qatari participants often open up to her about topics and issues that they may typically avoid when speaking with other GCC citizens. Qataris have spoken about boyfriends/girlfriends, alcohol consumption, getting tattoos, and additional haram or taboo activities. This is likely due to participants’ lack of fear of judgment. They know that the third author comes from a cultural standpoint that does not view such activities in a negative light; therefore, they are free to talk openly. So, while participants were placed in a position in which they had to express themselves in a foreign language (English), this limitation provided insight that may not be otherwise obtained—the freedom to reveal information that may be frowned upon among peers and family members was a welcome option.

We started with high-level questions such as “how often do you check ___ (social media site)?” and “what photos do you post?” From there, participants opened up about their thoughts and feelings regarding photo sharing with little prompting; we were careful to listen, to allow them to express themselves freely, and to ask probing questions as they naturally came up in conversation. This led to rich and varied discussions that provide the foundation for our theoretical contributions.

Data Analysis
Transcribing and Translating
Each interviewer transcribed their own interviews, focusing on participants’ conversational cues (e.g. laughter, hesitation, and pauses). Transcribing the interviews that contained both Arabic and English was conducted by the first author, who transcribed in the original spoken language. The goal was to preserve meaning in context, and not only the syntax and semantics of the interviews.

Analyzing Interview Data: Open Coding
The transcripts went through an iterative process of reading and generating high-level themes. Each author analyzed their data independently and then came together to discuss preliminary results. We then conducted an open and axial coding process to generate concepts.

Generating and validating themes was conducted using two perspectives: emic and etic. Developing codes emically means that “the researcher records information from the viewpoint of the people engaged in the social behavior under investigation” [61]. In other words, the emic themes will emerge inductively from the captured perspectives. In contrast, for the etic themes, we drew from our knowledge of the GCC and our combined experiences living in the region.

With this in mind, both interviewers read the transcripts while focusing on mentions of personhood, identity, photos and photo sharing applications, to gain insight into the participants’ experiences with photo sharing technologies and their association to identity construction. Throughout the analysis, the interviewers exchanged notes to identify and

---

3 Code-switching refers to the transitioning between languages in a single conversation among bilingual speakers [51].
validate overarching themes with an emphasis on the experiences of the entire participant population.

**FINDINGS**
The overarching theme we observed from the analysis of our data was that social media users in the Arab Gulf engage in photo sharing practices that construct a collective self that is distinct from—and sometimes in conflict with—an autonomous self. This collective self often trumps the autonomous self in shaping photo sharing practices. Here, we detail some of these photo sharing practices and discuss what they achieve for our participants as they construct appropriate identities for themselves that are accepted by their family and society as a whole.

**Learning to Present the Collective Self**
In their examination of the way Arab Gulf social media users engage in online surveillance practices, Vieweg & Hodges [67] draw from Hall [31] and Hooker [34] to explain the importance of the relationship-based cultural practice of personally communicating behavioral expectations. The authors show how online surveillance—conceived of as social [47] or participatory [6] surveillance—affords Arab Gulf social media users an important avenue for communicating those expectations to one another.

As described by participants in our current study, this relationship-based communicative practice can also be seen as an important avenue through which older generations socialize younger generations into appropriate ways of presenting the collective self via social media. Again, by collective self, we wish to emphasize an identity position where the individual is effectively an appendage of a much larger group structure. This is illustrated in the response by Hanna, a 26-year-old female, when the first author asked her about not using a real profile picture on Instagram when she joined:

> “At the time it was because I was still experimenting with these platforms what I can do and what I cannot do. [I would post something] and then wait when will my mom or my sisters say anything. [If they disapprove] they come to tell me why are you doing this kind of thing?”

In talking about her mother and sisters’ opinion regarding how she represents herself on Instagram, Hanna explains how she went about figuring out what was acceptable when it comes to photo sharing. She is negotiating boundaries through the platform by first putting content out there for others to see, and then waiting for a reaction. Experimenting and ‘testing out’ the content one shares is common with some sub-groups of social media users [e.g.,18,22,30]. Depending upon what type of comments she receives, Hanna makes the decision to keep or remove the photo.

Moreover, Hannah’s identity is not simply a reflection of an autonomous self that can be cleanly separated from the family. Rather, through her acts of self-presentation, she projects a collective identity that encapsulates herself as an integral part of a larger unit. In reading her self-presentation, others in the community are more apt to interpret any indiscretions as family indiscretions rather than individual ones. This motivates such photo sharers to project a collective self that attends to face needs that extend beyond the individual to the larger familial unit of which they are a part.

Here, the collectivist orientation factors into the way social media users like Hanna are socialized into presenting their collective self, a self that is the “standard bearer” of the family’s good name. In particular, females play an integral role in upholding the family’s name—a responsibility that is downplayed for males [9,48]. Hanna knows that the content of the photos she posts reflects upon her family, and if they deem a photo inappropriate or disrespectful, it is her duty to remove it and avoid similar posts in the future. Hanna’s situation is not unique; many female participants expressed similar situations. Manal, a female in her thirties, discusses her decisions to post content on social media. She explains that seeking approval from parents and feeling accountable for family honor is ingrained in her upbringing; she has been raised with this expectation in mind:

> “Being a girl in Saudi Arabia, I have been trained to ask for permission...I tried to do my best to be more authentic and do whatever I actually want and whatever represents me more. Hence, when I post things I post them for myself and even if my mom would tell me something after, I would say ‘ah, whatever!’ But I would think of her. I wouldn’t put something too revealing or [wearing] shorts or anything that she wouldn’t let me wear [in public] or lecture me if I wore. I wouldn’t post a picture of it out of respect to her.”

Manal’s comment reveals the distinction between the collective self and the autonomous self. When she mentions she would like to “be more authentic” and do “whatever represents me more,” she is referring to her wish to put forth an autonomous self that might act without regard for the collective implications of those actions. However, the respect for her mother and family eclipse personal desire. Upon reflection, she does not post photos that would bring disrespect to the family unit. In doing so, she projects her collective rather than her autonomous self.

Ensuring parental approval and validation regarding the presentation of one’s image is important because the risks of public sharing have far-reaching consequences on family honor and the individual’s safety and livelihood. “Shame,” “fear,” and “guilt” were amongst the emotions that many participants, especially females, expressed during our interviews in relation to photo sharing. In some cases, the consequences are more than just a mere negative feeling, they can be threatening to the livelihood of the person who brings shame to her family honor by revealing photos of herself. More severe consequences include home grounding, physical violence, and decrease of marriage prospects due to bad personal reputation.
Managing the Collective vs. Autonomous Self

Once social media users are socialized into the appropriate ways of presenting the collective self, they then must manage that collective self in relation to the autonomous self. This requires users to adopt a hypervigilant awareness of context and audience as they navigate between different facets of their lives.

In a collectivist oriented society, not only is seeking parental approval expected, but approval from the larger extended family is also common [8,11]. Waleed, a male who spent time studying at an American university, explains how his uncle’s erroneous assumptions were a source of shame that traveled across continents during his time abroad. In the following excerpt he discusses the results of posting a photo with a female colleague that was viewed by his uncle:

“This photo put me in trouble with my dad. He is okay but my uncle is a bit close-minded and he is not on social media. One of his daughters checked my Facebook account and saw some pictures with girls (female friends) and she showed it to her dad (my uncle). He took the photos and showed them to my dad and told him ‘you sent him for school and look what he is doing instead, he is making [female] friends and I assume that this is only what he posts in public. God knows what he is doing other than that in private.’ My dad was sad and my elder brother called me in the U.S. and told me the story and I called my dad and explained to him the situation and asked him to tell me the next time this happens because I have nothing to hide."

Having to manage expectations across contexts is very challenging, especially in long distance familial relationships, in which mistakes and misconceptions can be amplified. In addition, the varying levels of conservatism within families can lead to disagreements and strife over what is acceptable. In effect, Waleed’s perception of how to present himself via social media—i.e. to show his autonomous self—is not sanctioned by some members of his family, and became a source of strife.

In the following excerpt, Leena, a female in her twenties, explains the importance of being clear about the context and her collective self with her new friends that might not be aware of her cultural background (this was especially the case when she went to study abroad):

“[P]art of the way I live my life is that every time I make a new friend I have to let them know about my social context. I have to explain to them the reason why I don’t prefer to take pictures and if I do I told them flat out ‘please don’t share my pictures!’ It is not a privacy issue it is a safety issue for me, ‘so please don’t share my picture!’ It is something that I really hate. I hate to present myself in this context. I hate having to live this double life. Unfortunately, it is a luxury that I can’t afford at this time. There are many things I can lose because of this.”

In this excerpt, Leena explains how she enlists her friends’ help to manage her collective self in online contexts. For her it is important to explain her cultural background when meeting new friends that might not be familiar with or aware of the assumptions and expectations associated with that background. She must educate those friends about what it means to present oneself (namely, the collective self) appropriately online. In her conversations with the first author, Leena noted that her “Westernized appearance” (she does not wear hijab, the head covering or veil worn by Muslim women) confused new, Western friends who only saw an autonomous self without regard to the larger collective of which she is a part. In her face-to-face interactions with those friends, she presents her autonomous self; she is less concerned with how her self-presentation reflects her family’s collective identity. But on social media, she instead presents her collective self. Therefore, she needs to warn her new friends from posting group photos of her face or tagging her in any photos in an effort to gain their help with the presentation of her collective self in online contexts.

Leena also illustrates the conflict social media users can feel as they negotiate the presentation of different facets of the self in different environments. Although such conflicts have been widely recognized by social media researchers [e.g. 24,46], here we wish to underscore a unique dimension of this problem for Arab Gulf social media users. As Leena emphasizes, managing her collective self in an appropriate and acceptable manner is very much needed to protect her personal safety. The consequences of sharing culturally or religiously unacceptable photos of oneself can lead to shame and loss of face for the individual as well as their family. This is because in the Arab Gulf, modesty is a primary element of religious adherence, and modesty is reflected in speech, dress and conduct. In general, Muslims are advised to maintain a modest image when in public. For Muslims, being modest or having a sense of shame is a personality trait that prevents one from negative or harmful conduct [67]. It is a trait that allows them to project a collective self with deep concern toward how personal actions impact their larger familial unit.

As a further illustration of the way our participants managed a collective self as distinct from an autonomous self, Maysaa—a female who studied abroad—explains how she had to review the content on her profile frequently and had to double check each picture she posted:

“I preview my account every now and then. When I am online, my eyes are wide open for anything that might cause harm to my reputation. Now in the electronic world we live in, where we are posting everything, this is your electronic reputation. If you post specific kinds of photos, then they will think you are a bad girl.”

Maysaa cites the notion of her “electronic reputation.” This effectively points to the reputation associated with the presentation of her collective self—one that she needs to protect and maintain so as to appropriately represent her family and those who are vested in her public actions. Her electronic reputation is a part of that collective identity.
of how participants manage the collective and autonomous selves illustrates both the fluidity of these different facets of the self in interaction (one can move between one or the other as needed) as well as the variation that underlies the way cultural expectations are implemented in practice. Rather than rigid rules set in stone, cultural expectations—although widely shared and oriented to—undergo various degrees of shaping and reshaping as they are filtered through the prisms of familial upbringing, regional differences, and individual experiences. Ultimately, our participants exhibit an intimate understanding of what it takes to manage these dual facets of the self in different environments with different audiences. Commenting on this practice of displaying a collective self rather than the autonomous self on social photo sharing applications, Mona, a female in her twenties who just graduated high school, said:

“[I]t kind of deviates your image from what you really are to what you want to be. So people post about what they want to be rather than what they are. There are people that post pictures that are not true.”

Mona’s reflection underscores the way our participants often associate what we term the autonomous self with authenticity. Mona links her autonomous self with an identity position distinct from her collective self. Mona’s reflection also underscores the conflict that some feel as they negotiate divergent presentations of the self. For many, the presentation of the autonomous self feels more like a backstage performance in Goffman’s terms whereas the presentation of the collective self feels more like a front stage performance for a wider audience that holds a different set of expectations for how to be and act [29].

**Monitoring Shared Subject Matter**

The presentation of the collective self—and concomitantly, the protection of family honor (‘*a’dāth*)—also takes place through monitoring the subject matter one shares. In the following, Mariam explains why she would not share certain content:

Mariam: “If something will harm my brother’s reputation I would know and not share it.”

Interviewer: “How would you know that something would harm your brother’s reputation?”

Mariam: “Society norm; when they are at the house they segregate; I would not appear in the dawwānah (male-only living/gathering room) cause I know it is not something accepted. Also, I would not post anything that would indicate that we are an open-minded family...the word “open-minded” comes with a negative connotation in Saudi...that doesn’t mean liberal in a positive sense.”

Mariam compares her photo sharing behavior to actions she would regularly take (or not take, in this case) in her home. In many Gulf Arab homes, there are gender-exclusive spaces in which females and males who are not family members can freely socialize with those of the same gender; a female is
comes to their normal right. This is the worst thing! They are afraid to say ‘this is my face’ even when they want to. One day, I went to my sister and I told her if you want to post a photo, my face, as you see here…the effects…but I can’t.

Rula would like to use this particular app to create animated pictures of herself to share with others. She speaks wistfully, and admires many of the uploaded photos she has seen. She shows the second author several photos of others—people making faces, dancing, walking, and the like. She would like to create similar images to present her autonomous self, but taking a photo of her face and posting it would project a collective self that would bring great shame to her family. So she settles for maintaining an account, and merely looking at others’ photos. In effect, Rula is choosing the responsibilities of her collective self over the wishes of her autonomous self.

Posting faceless or blurred photos, or images of objects and landscapes are additional ways in which women in particular present a collective self in line with societal expectations. Abdu, a male in his late twenties, explains his mixed feelings regarding women partaking in such self-presentation:

“I understand why! I really understand why knowing the audience. Because you might be a good open-minded person but others are not, and our females are so scared when it comes to their normal right. This is the worst thing! They are afraid to say ‘this is my face’ even when they want to. One day, I went to my sister and I told her if you want to post a picture of yourself, do it, because you go to the street with your face showing. If you are afraid of what people would think, do it with a scarf on…but why the double standard?”

Abdu is one of many participants who used the expressions “double standard” or “double identity” when discussing how GCC nationals navigate social photo sharing, and social media in general. These expressions are illustrative of the faceted selves (collective and autonomous) we discuss throughout this paper. Abdu openly expresses his discomfort with these divergent forms of self-presentation when women move across contexts—especially from offline encounters to online encounters where collective considerations trump individual expressions of identity. He even challenged the norm by asking his sister—the bearer of family honor—to present herself in the way she wishes, or in line with her autonomous self. As with previous examples, this excerpt underscores the conflict that can occur as social media users negotiate the presentation of self, moving between the collective self and the autonomous self.

DISCUSSION

The pervasive use of photo sharing applications in the Arab Gulf has given rise to practices that involve new interpretations of how to put forth one’s identity in a relatively uncharted environment. In talking with social media users from Qatar and Saudi Arabia about photo sharing practices, we identified ways in which they perceive and manage their identities as they participate and communicate through various applications.

In line with previous research on how social media users “maintain social boundaries and show different facets” [24] of themselves in online contexts, we extend this idea to the understudied context of the Arab Gulf to gain a better understanding of the way collectivist, relationship-based cultural values impact how Arab Gulf social media users present themselves online. We suggest the terms collective self and autonomous self are useful (even if imperfect) analytic devices for teasing out the major facets of the self that are at play as these social media users engage in photo sharing.

By collective self, we wish to highlight an identity position a participant puts forth as an integral part of a larger familial unit (i.e. the collective whole). The collective self takes into account the face needs of that larger unit, which supersedes the needs and wishes of what is commonly referred to as the (single, discrete) “individual”—or what we term the autonomous self. By autonomous self, we therefore mean the facet of the self that is conceived of as an entity separate from or independent of the family unit.

To be clear, these terms are imperfect, especially since we know that any concept of self depends upon interaction with others so that there is no such thing as an individual separate from society. But we certainly do not wish to make any such claims. Rather, in using these terms, we wish to underscore the relative importance relegated to collective concerns among our participants in contrast to the way Western ideologies of the individual often overemphasize individual autonomy. Given that such ideologies of the individual are often shared among social media researchers and designers that come from, study, and design for communities with different cultural assumptions than those represented by our participants, our aim has been to disrupt those taken-for-granted assumptions about the role of individual autonomy as a driving force behind social media practices.

Instead of assuming a universal identity position for social media users premised upon one set of cultural assumptions where individual autonomy is highly valued, we urge the CSCW community to consider the way collective concerns may trump individual concerns for certain populations of users and take those concerns into account when designing
culturally sensitive and culturally relevant applications. As we have shown, when our participants engage in photo sharing, they do so with heightened awareness of how their actions and the content they share will impact the collective of which they are part. In any given situation, that collective may include the extended family, tribe, entire nation-state and/or religion.

Although our findings shed light on important cultural assumptions that guide our participants as they share photos online, we caution readers from essentializing these practices as if the relative importance afforded collectivist concerns were an “essence” equally shared among Gulf Arabs or an overriding factor to explain all online behavior of Gulf Arabs. Of equal concern is an exoticization of this population of users, treating the practices we describe here as necessarily and wholly different from practices engaged in by other groups around the world. With this in mind, we note that these concerns about collective identity are not unique to our participants. We surmise that further research on other communities of social media users where collectivist, relationship-based ideals are greatly valued would shed further light on how these different facets of the self (collective and autonomous) may be similarly negotiated. We understand that collectivist, relationship-based ideals are widely recognized as being highly valued in many parts of the world, and among many populations in traditionally individualistic societies, e.g. conservative religious communities within the U.S., where similar considerations about modesty or family reputation may shape the way social media users engage in the online presentation of the self.

In our globalized world, further research needs to probe the interaction between collectivist and individualist orientations on the way social media users from more traditional societies adopt and adapt applications designed outside those local contexts. Our participants often adhered to cultural expectations in photo sharing environments out of respect for their parents/family, due to fear, or to gain religious favor, among a host of other reasons. However, many participants spoke about their preference or wish to put forward a self that steps outside those traditional boundaries—e.g. for women, to show photos of their faces or be seen without hijab; for men, to share photos in which they are with female friends. Might this represent an emerging sense of individuality among younger social media users in communities where collective values remain prominent among older generations? If so, what role do social media technologies play in cultivating and reframing understandings of the self apart from the collective? Although answering such questions is beyond the scope of the current study, we hope to have laid groundwork that other researchers may build upon to answer these and similar questions.

Reflections on Conducting Research in the Arab Gulf

Throughout this research, we frequently discussed our thoughts about the lessons learned in conducting research in an environment in which “a researcher is not readily accepted in a traditional milieu that frowns upon those enquiring into other peoples’ lives” [8]. In the interest of guiding others and providing a model for similar research, we offer some reflections.

Bi-theoretical perspectives. We noticed the strong and often very clear distinction participants made between how they perceived themselves in line with an upbringing that emphasized collectivist values in comparison to what they viewed as the more individualistic perspective of “modern” or “Western” societies from which photo sharing applications originated. This dual understanding of us and them was fascinating to observe, especially with participants who spent time in “the West.” When we discussed photo sharing, participants not only focused on personal behavior but spoke about how technology is approached and perceived in Western countries based on their experiences either visiting or studying there. This perception contrasted greatly with the concerns our participants expressed about representing a whole larger than the individual self when they used photo sharing applications. We take this as further corroboration of the usefulness of our analytic devices in describing our participants’ photo sharing practices. Moreover, the keen awareness of cultural differences expressed by our participants with international experience underscores the way immersion in a different cultural environment provides an opportunity to unmask and become more aware of one’s own cultural assumptions that otherwise typically remain hidden. In many ways, this is what an ethnographically informed analysis like this study attempts to do for researchers and designers who do not have personal experience in the context being studied—namely, to learn about their own cultural assumptions that often guide technology design.

Stretching, reinventing existing theories. In the early stages of our investigation—as we attempted to formulate meta-level explanations for our observations—we found ourselves constrained with definitions and perspectives that were developed with non-Arab, non-Muslim populations in mind. However, we were able to scaffold on existing theories—i.e. Goffman’s self-presentation—and explain the practices we observed with our user population while at the same time providing a theory that is more encompassing of an international audience. Our goal was to be as representative as possible, to “think with” our participants, while offering a scientific contribution that extends beyond a single study. As noted in our discussion section, we hope other researchers will build upon this study to examine other populations that do not always share Western ideologies of the individual.

What We Learned

Thinking with our participants and learning the importance of maintaining an appropriate self-presentation with the collective in mind inspired a few thoughts on the design of culturally relevant photo sharing applications for users like those represented by our participants.
The collective self and family input. One of the prominent lessons we learned was the importance of family opinion and input in shaping the collective self—it is a process of trial and error. In many cases participants willingly allowed family to shape this self because of the value placed on maintaining family ties and respecting parents. In other words, their need to uphold a collective identity trumped unfettered individual expression.

Risk and conflict. Our participants expressed the different ways the autonomous self can run into conflict with the collective self. In other words, what they want to share versus what they are expected share. The penalties for presenting the autonomous self are greater than they would be in a more individualist-oriented society. A design suggestion is to include support for users to control who views their profiles, similar to the functionality already offered by Facebook. In addition, monitoring tools could show users who viewed their profiles, and allow them to better prepare and/or defend themselves if necessary.

Our ongoing research with this population continues to reveal the need for more research within CSCW to address how social media systems might be designed in a way that grants the needs of users faced with the challenge of constantly navigating the presentation of the autonomous and collectivist selves. How can photo sharing applications support myriad cultural values? What design and policy frameworks are needed to achieve culturally sensitive digital environments? These are big questions that require further attention and research.

CONCLUSION
Our data and analysis illustrate that social media users in the Arab Gulf engage in photo sharing practices that construct a collective self that often trumps expressions of an autonomous self. Understanding these facets of self-presentation holds important implications for designing photo sharing applications, which all too often start from and operate with assumptions about self-presentation favored in individualist-oriented societies. We argue for the need to take into account notions of the self widely adopted in societies like those of the Arab Gulf where collectivist concerns are highly valued. Based on our findings, we see a need to design photo sharing services and apps that consider the responsibilities of those who present identities in the name of honor, respect, safety and religious obligation.

We learned from participants—particularly women—the importance of actively managing and maintaining the presentation of the collective self to maintain a sense of safety and familial honor. We also became aware of the severity of the consequences associated with mishandling identities on photo sharing applications. Going forward, it is possible that these risks can be managed and mitigated through the inclusion of diverse user groups in design processes. In addition, the need exists for more cross-cultural research that investigates how users from non-Western societies express identities and invoke values through social media. Finally, through this study on photo sharing practices, we encourage and support the CSCW community in the mission toward more inclusive and culturally-sensitive design.

ACKNOWLEDGEMENTS
Sincere thanks to the participants for sharing their experiences on photo sharing applications and for the CSCW reviewers for helping us improve the presentation of this work.

REFERENCES


