Abstract
The area of usable privacy is one of the most challenging in system design. Despite strong efforts in attempting to study the implications of cultural differences on it, little attention has been given to the MENA (Middle East North Africa) region. We argue the importance of including this region due to its strong cultural differences and heritage. We present a survey (N=117) conducted on participants from a western and two Arab countries to compare privacy perceptions and privacy violation incidents. Preliminary results show cultural differences in reported privacy incidents, and demonstrate that privacy perceptions are influenced by the user’s background.

Author Keywords
Privacy; cross-cultural; WEIRD; privacy violation

Introduction
Users are the "weakest link" in any security system [16]. Poor understanding of security requirements of a system has often lead users to reduce or remove altogether the security of a system [8]. Hence, the area of usable security and privacy has attracted a lot of attention over the past decade. Understanding user needs and profiles is no longer a luxury in the critical issue of privacy and security.

A problem however, is that privacy perceptions and needs
can vary across different user groups and cultures. Researchers have investigated different user needs globally to understand how issues such as gender, cultural norms and backgrounds play a role in the user privacy concern domain [15]. Cross-cultural behavior and privacy perceptions have been collected by Habrach et al. across 8 different countries [2]. Privacy management tools have been developed to assist users in application privacy management [4].

The importance of this problem is demonstrated by the significant efforts to understand users globally. For example, Smith et al. compared users’ privacy requirements in USA and Italy [3]. While this research has strongly progressed the awareness and usability of privacy and security, most of it was conducted in Western-Educated-Industrialized-Rich-Democratic (WEIRD) countries [10]. This means that there might be novel privacy concerns in the MENA region that have not been studied in depth yet. For example, privacy invasions in countries with political turbulence might have lethal consequences, or individuals in some societies might believe they have the right to invade a particular family member’s privacy due to orthodox traditions.

In contrast to previous work, we study non-WEIRD countries, specifically from the MENA region to understand their specific privacy user requirements and develop design guidelines tailored to them. We started our research by conducting a survey (N=117) to investigate privacy violation perceptions of non-W.E.I.R.D. subjects from two Arab countries and W.E.I.R.D. subjects from Germany.

Related Work
Our work builds on related work in (1) understanding privacy perceptions, (2) building tools and systems to protect user privacy, and (3) understanding trust development.

Several studies aimed to understand privacy perceptions. Acquisti and Gross found that members of Facebook display different behavior towards privacy than their reported privacy concerns [1]. The online behavior of youth has been labelled as the “privacy paradox”, where some report to care about privacy yet end up sharing personal information through social media [9]. Choi et al. investigated the effect of revealing sensitive and sometimes embarrassing information by their friends on social networks on the psychology of users. The results showed that users sometimes viewed this as a privacy violation [3]. Wisniewski et al. classified users into six profiles (Privacy Maximizers, Selective Sharers, Privacy Balancers, Self-Censors, Time Savers/Consumers, and Privacy Minimalists) who perceive social media privacy differently [16]. These six profiles can be utilized to perfect privacy design guidelines for users and hence design according to their preferences. Kang et al. studied how well privacy concerns of MTurk workers mirror those of the U.S. public [12]. They found that U.S. MTurk workers had higher privacy concerns compared to both the U.S. public and Indian MTurk workers.

Another strand of previous work focused on building systems that protect privacy. Safebook is an application specially designed to counteract common privacy threats on online social media such as identity theft, impersonation and others [13]. Li et al. have even developed a cross-cultural prediction model that uses the demographic and cultural parameters and a machine learning technique to predict the privacy preferences of users [14]. A study conducted by Fiesler et al. used Machine Learning techniques to identify content types and found correlations with age and gender but did not identify significant relationship to privacy setting (public versus limited) [7].

Trust development and breaches patterns was also investigated in previous work. Studies have been conducted to
evaluate how trust breaches affect relationships and how trust can be developed through a relationship online and offline [2, 5].

Privacy Violation Survey
A survey was conducted on 117 participants divided equally between Germany and two Arab countries (Egypt and Saudi Arabia). The survey is conducted in a WEIRD country, Germany, to create a frame of reference and comparison to the non-WEIRD countries, Egypt and Saudi Arabia. Privacy concerns among Germans were studied extensively in previous work, and they represent a WEIRD population. On the other hand, privacy concerns Egypt and Saudi Arabia were relatively under-investigated, and they both share a lot of cultural traits due to their Arab origins. The survey identified privacy concerns and perceptions of participants as well as reported incidents of privacy violations. The survey was in the form of a questionnaire divided into sections that collected information about a reported privacy invasion scenario, took and statistics about different gathered privacy invasion types that users have experienced/witnessed. Participants were also asked about their feelings and impressions of these violations as well as the extra security precautions they took after the incidents. Finally, participants were asked about the times and individuals they believed privacy violations is accepted from. Participants were given the space to define their own privacy violations through an open-ended question. This allowed for participants’ views of the violations to be expressed freely without. Results were grouped and coded according to incident type, attacker relationship, effect on relationship between attacker and victim and perception change in privacy. Results show some differences across cultures. Privacy violations reactions were more severe in Arab countries where participants reported to change their privacy behavior more after violation incidents. This can be justified by the collectivist nature of the Arab cultures (see Hofstede’s cultural dimensions theory [11]) that allows them to be more trusting. Any violations of this trust can be shocking and hence cause lots of strong responses. German participants also reported more shoulder surfing incidents than their Arab counterparts. This can be justified by the fact that more members of the medium-to-high socioeconomic group ride public transportation where more shoulder surfing occurs [6], this was the group of participants who answered the survey. More credit card theft experiences were reported by Arab participants. This can be due to the lower efficiency of credit card companies by bank in Arab countries. German participants reported to only accept privacy invasion when the security safety of a person is at risk while Arabs reported acceptable reasons to be both security safety and parents supervising their children which matches the family-oriented nature of the Arabic culture. These findings relate to many cultural differences displayed across both cultures that should be further investigated using follow-up interviews with participants which is the future work of this study.

Conclusion
This work argues the importance of studying privacy in different regions globally. We focus our work on social media and how it influences privacy perception specifically in the MENA region. A survey was conducted to study incidents of privacy violations in a western country and 2 Arab countries to compare different incidents, trends and effects of privacy violations across the two regions. Results show differences in cultural background affecting privacy perceptions and reported incidents. This work therefore should further investigate privacy needs of these communities and develop specific design guidelines to match them.
REFERENCES


