Communication Behaviors When Displaced: A Case Study of Za'atari Syrian Refugee Camp

Ying Xu
College of Info Sciences & Technology
Penn State University
University Park, PA USA
1.814.321.4877
ying.xu@psu.edu

Carleen Maitland
College of Info Sciences & Technology
Penn State University
University Park, PA USA
1.814.441.3445
cmaitland@ist.psu.edu

ABSTRACT
In this study, we examine refugees' use of mobile communication and Internet services. Our findings are based on survey data collected at Za'atari Syrian refugee camp in Jordan, providing systematic quantitative analyses to complement anecdotal accounts reported in the media. More importantly, our findings directly inform humanitarian program development and may be used to develop related information services. First, in terms of frequency of use, we find that social media are used more frequently than SMS, mobile voice, Skype and email. Second, through multivariate regression with demographic variables, we find that sex is a significant predictor of the type of communication service, which differs depending on recipient location. Third, we identified the three most popular information sources are Google, Facebook and YouTube Lastly, we discuss how these findings, in particular, highlighting the heterogeneity of refugee ICT use and online interests, can inform information service design.

CCS Concepts
• Social and professional topics→User charateristics • Human-centered computing→Accessibility.

Keywords
Refugee Camp; Forced Migration; Communication Behavior; Survey Study; Confirmatory Factor Analysis; Multivariate Regression.

1. INTRODUCTION
By the end of 2014, 59.5 million individuals were forcibly displaced from their homes [12]. In many cases, the displaced are also forcibly separated from their loved ones. Displacement creates a variety of information and communication needs, including maintaining connections with family and friends, keeping updated on the latest news, and staying informed for making decisions about subsequent moves. Increasingly, these needs are becoming top priorities, together with food, shelter and safety. Especially with the high penetration rate of mobile phones and increasing availability of Internet access, the role of information and communication technologies (ICTs) in facilitating refugees' lives in asylum calls for further analysis.

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Globally, there are 19.5 million refugees and 86% are hosted in developing countries [12]. Motivated by the protracted situation in Syria and increasing refugee populations seeking a safe haven in the Middle East and Europe, we conducted a case study in Za'atari refugee camp in Jordan to understand Syrian refugees' use of communication services. In particular, our research examines:

1. What communication services do refugees use in the camp, and how do they differ from use in Syria?
2. Which demographic variables predict use of traditional communication services (e.g. SMS, mobile voice, and email) versus use of social media (e.g. Facebook, and Twitter) and social messaging (e.g. WhatsApp, Viber, and Skype)?
3. Does recipient location (locally in Jordan versus internationally in Syria) affect communication service use?
4. If Internet access was reliable, high speed or inexpensive, what kinds of online activities would be of interest to refugees?

2. RELATED RESEARCH
2.1 ICT Use in Middle East
As our research investigates ICT use by refugees from and fleeing to the Middle East, our findings may inform this broader literature, which has evolved early studies of Internet diffusion to more recent studies of the role of social media in political change.

Researches have found the digital divide between the Middle East and western countries is closing and that ICTs contributed to the promotion of democracy and freedom of expression [11] [13]. Other works investigate censorship and surveillance. For example, Al-Rawi [1] examined the Syrian Electronic Army and its claims to be a neutral organization protecting its national cyberspace, and Wagner at el. found Internet use had a positive effect on political participation, but only where filtering was limited [14].

2.2 Communication Technology Use by Refugees
Research into refugees' communication technology use has focused on urban, camp-based and resettled refugees. In each of these circumstances the information needs of refugees as well as access to mobile networks and the Internet may differ significantly. Reports of use in well-established camps suggest refugees are eager to use social media for variety of reasons including communication with loved ones, feeling connected, overcoming isolation, and having their stories told [10]. Social media such as Facebook, and mapping technologies have been found to be useful in coordinating travel to neighboring countries [7]. On the other hand, some refugee studies in communication focus on the differences between how information is delivered and received between refugees and service providers given the

variations of culture, power, language and institutions [3]. For example, Danielson [4] examined the dynamics of information delivery with urban refugees in Cairo, Egypt.

3. ZA'TARI SYRIAN REFUGEE CAMP

Located in a desert region near the border of Syria in Jordan, Za'atari Refugee Camp, one of the world's largest, now stably hosts more than 80,000 Syrian refugees. With the help of Jordanian government, UNHCR and other 47 humanitarian organizations provide wide-ranging services.

Refugees who can afford to do so have access to three Jordanian cellular networks and may be able to reach Syrian carriers as well to communicate with friends and family who remain in Syria or have relocated to Jordan or other countries. Mobile and Internet access are supported by a variety of economic activities within the camp. For instance, the camp hosts approximately 3000 refugee owned and operated shops [9]. Among them are retailers of phones, batteries, chargers and SIM cards. UNHCR and other service providers are interested in the mobile phone and Internet use as potential bases for information distribution and as platforms for social service programs.

4. METHOD – SURVEY STUDY

In January 2015, with a permit from the Jordanian Ministry of the Interior, we conducted a survey study in conjunction with UNHCR and its implementing agencies in Za'atari. Our survey instrument was developed collaboratively, using the method of translation/back translation between English and Arabic with assistance from Syrian and Jordanian academics. Demographics and communication behaviors were measured via 13 items measuring participants' age, sex, education level, English abilities, mobile phone ownership, number of SIM cards owned and borrowed, communication services, information sources used in Syria and Jordan, and future interests in online activities.

We mainly distributed the pen-and-paper survey in training centers and on the street. Three refugees volunteers fluent in English and Arabic were employed to provide instructions to respondents and translate when needed. The process generated data from 234 usable surveys. Since 192 (82%) of the surveys were collected from training centers, this study is slightly biased towards those who are more likely to engage with programs offered by service providers.

The basic demographics are as follows. The age range of participants is from 15 to 45, with an average of 23 years old. Youths, defined by UNHCR as between the age of 15 and 24, make up 67% of the sample. The gender balance is fairly even, with 6 more females than males. The sample is fairly well-educated with nearly 43% having either started or completed a university degree. By sex, we find that in upper levels of education, particularly 'some university' and 'finished university' more males than females have achieved that level.

We organize the following sections from the perspectives of mobile phone and Internet access, communication behaviors, information sources and interested Internet activities, and use both descriptive statistics and regression to answer the four research questions.

5. MOBILE PHONE AND INTERNET ACCESS

Data from two survey questions on handset ownership, handset brand and SIM card ownership indicate, among our sample, mobile phone and SIM card penetration rates are 89% and 85% respectively, reflecting the relatively high penetration rate (90%) of prepaid SIM cards in Syria [5].

Further, our data indicate 78% of our sample, on average, borrow at least one SIM card, and among them 34.4% borrow more than one.

Accordingly, we find that mobile phones on cellular networks are the most common Internet access mode. Respondents reported that while in Syria, 52% used the Internet only via mobile phones – either through their own phone (80%) or borrowing other's (20%). However, now living in Jordan, 69% connect only via mobile phones, with 89% owning them. On the other side of the increasing use of mobile Internet is the decreasing use of computers. In Syria, 24% of the participants connected only via computers while the figure dropped to 10% in Jordan. The findings show that the diversity of Internet access modes is reduced, with mobile becoming critical, as people are displaced.

6. COMMUNICATION BEHAVIORS IN ZA'ATARI REFUGEE CAMP

6.1 Social Messaging Dominates Communication Services

Separated from families and friends in their home country and with more spare time in the camp, communication, information seeking and building or reinforcing social networks are prominent. In order to understand communication behaviors when contacting friends and relatives both in Syria and Jordan, we asked which kinds of communication services they use and the frequency of use by each kind with a 6 point Likert scale, ranging from 'never' to 'multiple times per day'. We find that to communicate with people living in either Jordan or Syria, WhatsApp, mobile voice and Viber are the three most used services. We use t-test to examine whether there is a significant difference in the use of these communication services to contact people living in Syria and Jordan. From the result, only mobile voice is used significantly more when communicating with people living in Jordan than Syria ($p<.001$), all the others experience no significant differences.

In terms of the number of users, mobile voice has been used by more people after residing in the camp. All the other communication channels, especially those Internet-enabled messaging applications, are being used by fewer people in Za'atari. Nevertheless, the use frequencies of all communication services are experiencing an increase except Skype.

6.2 Demographic Features of the Choices of Communication Services

Next, we investigate the role of demographic factors in predicting the choice of communication services. We use ordinary least square (OLS) regression model in testing the relationships. Here, the goal of our analysis is to identify general relationships, rather than model testing. In general, sex, comparing to other demographics like age, education level and English abilities, has a significant role in predicting the use of many communication services.

As shown in Table 1, age, education level and English abilities are not significant predictors in the use of communication services when communicating with people in Syria. Sex, however, is a strong predictor in the use of WhatsApp, Viber, and Skype – males are more likely to use them than females. When communicating with people living in Jordan, as Table 2 shows, age and English abilities have no significant effects. However,

males are more likely to use mobile voice, Viber and email than females. And people who have higher education level are more likely to use Viber in Za'atari.

7. INFORMATION SOURCES

In addition to communication services refugees use, we asked open questions to understand their general choices of information sources and the frequency of use. In total, 147 participants reported 160 open responses of information sources they use in Syria and 99 participants provided 122 sources they use in Jordan. Through analyzing these reported open answers, we found that top three information sources in Syria are Google (39%), Facebook (11%) and YouTube (8%). Even though 38% of the participants reported that there is no change in choosing information sources, among those who experienced the difference, 33% listed new information sources in the camp including Facebook and YouTube which they did not access back in Syria. We also witnessed the increasing use of other social media like WhatsApp. Additionally, there are 6% of the participants reported that they stopped using the Internet in Jordan. Besides the choices of information sources, the frequency of using them are also examined. For example, Google, Facebook, YouTube, Skype, Wikipedia and WhatsApp are witnessing an average increase of 20%.

Table 1 Prediction of the Use of Communication Service When Communicating with People in Syria

Services / Demographics	Mobile Voice	SMS/Text	WhatsApp	Viber	Skype	Email
Age	.03	.05	-.07	-.12	.01	-.17
Sex	-.02	-.03	-.17*	-.22*	-.33**	-.22
Education Level	.06	-.16	.08	-.06	-.16	.02
English Ability	.05	.06	-.07	-.05	.09	.14
R^2	.01	.02	.04	.06	.11	.08
Adjusted R^2	.02	.03	.01	.02	.06	.03

Note: Cells entries are standardized Beta coefficients from OLS regression. P<.001 *** P<.01** P<.05*.

Table 2 Prediction of the Use of Communication Services When Communicating with People in Jordan

Services / Demographics	Mobile Voice	SMS/Text	WhatsApp	Viber	Skype	Email
Age	-.10	.14	-.15	-.03	.06	-.02
Sex	-.17*	-.06	-.12	-.35***	-.22	-.34**
Education Level	.16	-.09	.11	.33**	.01	.03
English Ability	.10	.20	.09	.13	.15	.20
R^2	,08**	.05	.05	.10	.08	.18**
Adjusted R^2	.06**	.004	.02	.05	.03	.13**

Note: Cells entries are standardized Beta coefficients from OLS regression. P<.001 *** P<.01** P<.05*

8. INTERNET ACTIVITIES AND FUTURE DEVELOPMENT

Given the understanding of communication behaviors by refugees living in a refugee camp, we are curious what online activities they wish to participate in if Internet access was reliable, high speed or inexpensive. Here we group the results of these 17 online interests by using confirmatory factor analysis (CFA). The analysis confirms six main areas of interest: online education (α = .84, M = 3.30, SD = 1.83), information seeking (α = .83, M = 3.44, SD = 1.78), entertainment (α = .75, M = 2.78, SD = 1.98), communication motivation (α = .95, M = 3.50, SD = 1.85) and media 1 (α = .84, M = 3.65, SD = 1.87) and media 2 (α = .86, M = 2.75, SD = 1.96). This six-factor model shows a good fit with Chi-Square=212.80, DF=104, Chi-Square/DF=2.05, CFI=.93, RMSEA=.07, and SRMR=.05. Online education interests include both formal and vocational training programs. Media 1 includes social media applications like WhatsApp and Facebook, while Media 2 captures interests in less popular (social) media such as Twitter, YouTube, Skype, Viber and email. Information seeking includes the channels refugees use to be aware of the complex situations they are in, such as news, jobs and employment, health and legal information search, and geographical information. Entertainment interests include sports and gaming. As for communication needs, both contacting people inside and outside the camp, are captured in motivation.

In general, refugees with different age do not show much difference in their interests in online activities but entertainment, with the younger the higher interests in online entertainment activities. Education level is a strong predictor in online education, media use and communication. Since English ability is significantly correlated with education level, it also shows similar effects. In addition, male and female are equally interested in online education, entertainment activities and popular media use like WhatsApp; however, males tend to be more interested in those less popular media than female users.

Therefore, to advocate higher participation of online activities, especially online education, improving refugee's education level and English skills may improve their confidence as well as interest.

Our findings are concurrent with the study by Hargittai at el. [6], showing that education is positively correlated with 'capital enhancing' online activities. Also, our study shows evidences for

Helsper's finding in that older users undertake a more narrow range of online activities [8].

Table 3 Prediction of Online Activities Interests

Factors / Demographics	Online Education	Media 1	Media 2	Information Seeking	Entertainment	Communication motivation
Age	.03	-.10	-.18	-.03	-.38***	-.05
Sex	-.10	-.36***	-.44***	-.35***	-.37***	-.38***
Education Level	.36***	.16	. 27*	.33**	0.05	.21*
English Ability	.14	.14	.11	.13	.14	.08
R^2	.21***	.26***	.35***	.34***	.23***	.23***
Adjusted R^2	.18***	.18***	.32***	.31***	.20***	.20***

Note: Cells entries are standardized Beta coefficients from OLS regression. P<.001 *** P<.01** P<.05*

9. DISCUSSION AND CONCLUSIONS

Our study contributes to the understanding of communication behaviors by refugees in the Middle East, especially the role of mobile phones and social media in facilitating their communication. While the unique situation in every refugee source country in terms of its political, economic and cultural states, suggest caution in generalizing our findings, we offer the following recommendations.

Our findings suggest social media based refugee services designed for mobile devices will be of greatest use, both while in transit and once settled. However, as we have found that demographic factors such as sex, education level and age are significant predictors in the choice of communication services and interests in online activities, targeting different demographics and thereby recognizing the heterogeneity of refugee populations with tailored programs is likely to enhance service effectiveness. For example, use of WhatsApp in communication campaigns is likely to be more effective in targeting men than women, and online education opportunities are likely to be more successful with more highly educated groups. Going forward, outreach campaigns should consider carefully the target audience and their preferred platforms for ICT based information seeking.

In addition to these recommendations for practitioners, our aim is also to inform scholarship on refugee research from multiple disciplines. As communication technologies interact with the dynamic social network among refugees and institutions, future studies could explore the roles of ICTs in coordinating global refugee response building on the findings of this study.

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