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Transnational Families in Armenia and Information Communication Technology Use

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Considerable evidence has shown that migrants use ICT to maintain connections to their families and home. Unlike most previous researchers of migrant ICT use, we study those left behind. Using a nationally representative sample in which two thirds of respondent households have a migrant, we determine the effect of this on ICT use. Multivariate analyses including relevant demographic factors that influence both migration and ICT use reveal that transnational (migrant) family status influences frequency of Internet use, Internet ownership, and Skype use, but not other activities. Given the positive social effects of maintaining family connections, ICT use may lessen the negative effects of migration on families and society.

A substantial body of evidence shows that labor migrants use ICTs to maintain connections to their families and home country. However, unlike previous studies on labor migrant ICT use, this article focuses on the use of ICTs by people who remain in their home country but are affected by labor migration. Particularly, we argue that the reciprocal nature of communication technologies makes those who remain as important a target of study as their labor migrant family members. Using a nationally representative sample in which two thirds of respondent Armenian households had a family member currently working as a labor migrant, we analyzed the relationship between the effects of having a family member who is a labor migrant (i.e., being a transnational family) and the use of ICTs. We found statistically significant differences between transnational and nontransnational families in Internet frequency, ownership of PCs, ownership of an Internet connection and mobile Internet connection ownership, and Skype use. There were no differences in mobile phone ownership, PC Internet connection, e-mail, Facebook, or other social networking site (SNS) use. This indicates that transnational family status

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influences the use of certain ICTs in Armenia, which may have effects at both the household and national levels. Specifically deserving of attention is Armenia's greater use of ICTs in comparison to similar countries with less labor migration. Further, given the well-known positive social effects of maintaining connections among members of transnational families, use of ICTs may lessen labor migration's negative effects on Armenian households and society. Finally, this study is noteworthy for its focus on the family rather than the migrant alone.

Introduction

Our study approaches migration from the perspective of transnationalism. Transnationalism is "the process by which immigrants build social fields that link together their country of origin and their country of settlement" (Schiller, Basch, & Blanc-Szanton, 1992, p. 1). Further, transnational migrants "take actions, make decisions, feel concerns, and develop identities . . . that connect them to two or more societies simultaneously" (Schiller et al., 1992, p. 12). Transnational families are "families that live some or most of the time separated from each other, yet hold together and create something that can be seen as a feeling of collective welfare and unity, namely 'familyhood,' even across national borders" (Bryceson & Vuorela, 2002, p. 3). Furthermore, transnational families that are considered through a familial lens provide a "useful empirical focus of study" (Olwig, 2003, p. 787) of migrants.

Armenia

Since gaining its independence in 1991, Armenia has been challenged by external conflict, internal instability, political strife, and a frozen conflict with neighboring Azerbaijan (Heritage Foundation, 2008). With a per capita GDP of US$5,700 (Central Intelligence Agency, 2011), Armenia is considered an economically developing country. Economic inequality is great: nearly a third of Armenians (32%) do not have enough money for food, and another third (36%) can afford food but not clothing (Pearce, 2011a).

Family in Armenia

Maintaining family ties is essential in Armenia for several reasons. Ishkanian (2008) argues that Armenians without strong family ties become isolated, vulnerable, marginalized, and unable to advance socially, economically, or politically. Moreover, to get by in present-day Armenia, reliance on kin is essential to navigate the nepotistic, corrupt, and challenging day-to-day existence. This creates a unique context for study of interpersonal communication mediated through ICTs because of ICTs' role in fostering connectedness and sociability, which Armenians value highly as reaffirming family ties (Ling, 2004, 2008; Rice & Hagen, 2010). Behaviors driven by kinship influence mobile phone adoption (Fortunati, 2002; Horst & Miller, 2005) and in some cases intensify it (Pertierra, 2007; Tenhunen, 2008).

Labor Migration in Armenia

Labor migration is significant in Armenia where 8–14% of households have at least one labor migrant member (for an overview of the Armenian migration situation see Agadjanian & Sevoyan, 2013; Gevorkyan & Mashuryan, 2006; Grigorian & Melkonyan, 2011; Menjívar & Agadjanian, 2007; Minasyan,

Poghosyan, Hakobyan, & Hancilova, 2007; Minasyan, Yeganyan, Kumar, & Baruah, 2009; Poghosyan, 2003). Since the Soviet Union collapsed, Armenia has lost approximately 15% of its population to migration in the two decades (Heleniak, 2008). Meanwhile, remittances account for over 20% of the Armenian GDP (Central Bank of Armenia, 2006), and many households depend on remittances for survival.

Labor migration is a significant contributor to emigration, with 94% of migrants leaving for work because they lack employment opportunities or higher paying jobs in Armenia (Minasyan et al., 2009). Demographically, 94% of Armenian labor migrants are men (Sevoyan, 2011) between the ages of 21 and 50 (Minasyan et al., 2009). And, perhaps surprisingly, seasonal migrants in Armenia tend to come from average-income rather than low-income households (Minasyan & Hancilova, 2005). In fact, many labor migrants say their earnings go toward additional household costs like university fees, tutors, and home renovation, not basic expenses (Minasyan et al., 2009).

Most of these migrants go to Russia to work in the construction industry (Minasyan et al., 2009). This is called *khopan*, work in "virgin lands" (referring to a Soviet-era push to entice Western Soviets to settle sparsely populated lands in Central Asia). In this pattern, men leave for seasonal work in construction and agriculture from January to August and return between September and December (Heleniak, 2008; Minasyan et al., 2007, 2009). These labor migrants believe that they cannot return to Armenia permanently due to lack of employment (Minasyan et al., 2009).

ICT Use in Transnational Families

Numerous studies have examined the use of ICTs by transnational families. Most studies of migrant ICT use focus on maintaining ties with the home country (Aguila, 2009; Hiller & Franz, 2004; Horst, 2006; Johanson & Denison, 2011; Komito & Bates, 2009; Lang, Oreglia, & Thomas, 2010; Law & Peng, 2008; Nedelcu, 2012; Panagakos & Horst, 2006; Şenyürekl & Detzner, 2009; Thomas & Lim, 2009, 2011; Wallis, 2011; Yang, 2008), and some studies have indicated that ICT use allows migrants to create and maintain social networks in their host country (Lin & Sun, 2010; Oiarzabal, 2012; Sun, 2006; Thomas & Lim, 2009, 2011; Thompson, 2009; Wallis, 2011), and seek information (Schaub, 2011).

Also, a subgroup of studies have specifically examined transnational parenting (Carling, Menjívar, & Schmalzbauer, 2012; Dare, 2011; Dreby, 2006; Leifsen & Tymczuk, 2012; Malik & Kadir, 2011; Tungohan, 2013; Uy-Tioco, 2007).) These studies typically focus on the emotional aspects of transnational parenting, but some cover practical characteristics of ICT use as well, such as a father monitoring his children via webcam when his wife leaves the room (Nedelcu, 2012). Generally, these actions are referred to as virtual connectedness—the performance of kinship through ICTs (Baldassar, Baldock, & Wilding, 2007; Wilding, 2006) or what Vertovec (2004) calls social glue for transnational families. Similarly, Diminescu (2008) argues that a connected migrant is able to share and access important information while virtually inhabiting multiple distant geographical spaces.

Another theoretical perspective that may advance understanding of ICT use by transnational families is the concept of connected presence (Licoppe, 2003, 2004), which suggests mobile phones (and, we would argue, ICTs generally) present a lower threshold for interpersonal interaction, and that individuals constantly communicate with intimate others, creating a feeling of permanent connection and ongoing conversation. Furthermore, ICTs blur the distinction between presence and absence of loved ones because they are always available through some means. Bacigalupe and Cámara (2012) allude to this by describing how transnational migrants create ambient co-presence among family members, sharing otherwise inaccessible information.

A similar theoretical perspective is perpetual contact (Katz & Aakhus, 2002), in which the promise of perpetual contact—the uninterrupted potential for synchronous or asynchronous communication with others at any place or time—exists through an increasing number of divergent and convergent personal communication technologies, with intimate others' structuring communication around individuals' "competing needs for connection and autonomy" (p. 316).

Regardless of theoretical orientation, most studies of migrant ICT use center on the perspective of the migrants themselves (noteworthy exceptions are Bacigalupe and Cámara, 2012; Benítez, 2012; Madianou and Miller, 2011), an approach that prevails outside of ICT studies as well. As Bacigalupe and Lambe (2011) argue, "despite the psychosocial and relational impact of migration on those left behind, the scant literature that exists on transnational migrant families generally focuses on the members who have migrated and not those who remain" (p. 18). In fact, Levitt and Nyberg-Sørensen (2004) consider "those who stay behind but receive support from those who migrate" (p. 6) as having experienced transnational migration as well.

Our study adopts a transnational family perspective to focus exclusively on households experiencing transnational migration as the "left behind" rather than as migrants. In accord with connection theories, we propose to enhance understanding of the use of ICTs in maintaining family connections by ensuring that both perspectives are investigated empirically.

ICTs in Armenia

ICT adoption and use in Armenia is strongly dependent on English-language proficiency as well as age, economic well-being, education, and urban-ness. Only recently has Internet penetration reached double digits, primarily due to mobile Internet (Pearce, 2011b; Pearce & Rice, 2013).

Personal Computers

Personal computers are not commonly used in business environments in Armenia (Selian, 2005); similarly, "at work" is not a popular Internet use location (using the Internet "at work" was only mentioned by 17% of Internet users in 2011). Nor is Internet popular in educational settings (less than 3% of Internet users use it at an educational institution or library). Instead, Internet use in Armenia is often either at an Internet café or in one's home. Home PC ownership has grown substantially in the past

decade (Table 1). A third of Armenian households have a personal computer, a noteworthy increase from 15% in 2009, due to a government subsidy program and increased Internet access (Pearce, 2011b).

Table 1. Household Personal Computer Adoption in Armenia (% of households).

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Data source									
International Telecommunication Union	4.00%	5.51%	6.76%	8.32%	10.23 %	15.4 %	n/a	28.7%	n/a
Caucasus Barometer	n/a	12.3%	10.8%	11.4%	14.7%	14.7 %	26.7%	39.5%	53.1%
Gallup Organization	n/a	n/a	13.5%	16.8%	17.1%	n/a	n/a	n/a	n/a

Internet

As indicated in Table 2, Internet adoption in Armenia has been increasing steadily since 2005. Dial-up services, used by 17% of personal computer users (in this study), are the most affordable, with night hours costing AMD 0.5 per minute (approximately US$0.08 per hour) and AMD 1.5 per minute during the day (approximately US$0.24 per hour) ("Web.am Internet Costs," 2011). To use this service, individuals purchase prepaid scratch-off cards. Over a quarter (28%) of personal computer owners in this study have DSL. In 2011, an unlimited ADSL connection of 1024 kbps cost AMD 13,000 a month or approximately US$34 ("Beeline.am Internet Costs," 2011), or AMD 36,000 (US$94) from a different provider ("Web.am Internet Costs," 2011). Neither of these prices includes the cost of a DSL modem or connection setup, which adds hundreds of dollars to the initial cost. In terms of geographic distribution, dial-up services vary in regional cities and are rare in rural areas; ADSL service is available in the largest regional cities, but not in rural areas.

Table 2. Home Internet Adoption in Armenia (% of households).

	2005	2006	2007	2008	2009	2010	2011	2012
Data source								
International Telecommunications Union	2.9%	4.2%	4.4%	5.8%	9.5%	15.0%	25.4%	n/a
Caucasus Barometer	n/a	n/a	4.3%	7.0%	5.8%	19.3%	34.5%	47.9%
Gallup	n/a	5.4%	7.6%	11.2%	10.8%	22.6%	n/a	n/a

Mobile-Based

Mobile-based communication has grown rapidly in Armenia in the last decade (Table 3). Along with mobile communication growth, mobile Internet connectivity has become popular in the past few years. Mobile connectivity, unlike ADSL or dial-up, is available across much of the country ("Orange Coverage Map," 2011; "Vivacell Coverage Map," 2011). The International Telecommunication Union reports that 1% of Armenians in 2009 and 5.17% in 2010 used mobile Internet, but our data show that mobile Internet use is much more popular and primarily occurs in three ways: via an Internet-enabled mobile phone, tethering, or the use of a USB stick. These forms of mobile Internet use are discussed in detail below.

Table 3. Household Mobile Phone Adoption in Armenia (% of households).

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Data source											
International Telecommunications Union	2.3%	3.7%	6.6%	10.4%	41.0%	61.0%	75.9%	84.9%	125.0%	104.0%	106.8 %
Caucasus Barometer	n/a	n/a	n/a	24.5%	46.8%	69.6%	76.8%	80.8%	91.4%	91.6%	97.5%
Gallup	n/a	n/a	n/a	n/a	n/a	64.4%	71.9%	80.8%	86.6%	n/a	n/a

Roughly 16% of Armenia's Internet users use a data plan from an Internet-enabled mobile phone to access the Internet. Data plans cost AMD 0.20 per kilobyte ("Orange Internet Now Cost," 2011). Typically, these users have no or little access to the Internet via a personal computer. Tethering means sharing an Internet-capable mobile phone's Internet connection (Pearce & Rice, 2013) with a computer. This form of Internet access uses the same data plan described above, but allows connection to the Internet with a computer. At the time of this writing, 30% of Internet users tether their mobile phone to a computer as their primary Internet connection.

The third, most popular form of mobile Internet use is a USB stick that is placed in a computer (40% of Internet users). In fall 2011, an unlimited package for a VivaCell USB stick cost AMD 17,000 (US$44), an initial AMD 1,000 (US$3), and a monthly fee of AMD 8,800 (US$23) ("Vivacell GPRS Costs," 2011). Orange, an Internet company operating in Armenia, provides a USB stick free of charge with a one-year unlimited Internet use subscription, which costs between AMD 6,000 (US$15) and AMD 20,000 (US$52) per month, depending on the speed ("Orange Internet Now Cost," 2011).

Research Question

This study aims to explore the impact of being a transnational family on the following aspects of ICT ownership and use: frequency of Internet use; ownership of a personal computer, mobile phone, Internet connection, PC Internet connection, or mobile Internet; and use of e-mail, Facebook, other SNSs, and Skype. We will control for the antecedents previously demonstrated to be related to ICT ownership and use in Armenia: urban-ness, age, economic well-being, education, and English-language proficiency.

Method

Respondents

Respondents were members of households in Armenia (*N* = 2,365) who participated in a face-to-face survey administered by the Caucasus Research Resource Center which is conducted annually in Armenia, Azerbaijan, and Georgia. Surveys were translated and back-translated into Armenian (the questionnaire was developed in English and then administered in four regional languages, hence the need for back-translation). The results are available to the public via the center's website (www.crrccenters.org). Participation in the survey was voluntary and anonymous.

Sampling

The sampling universe was all adult (age 18+) residents in November 2011. The sample design was based on multistage area probability sampling. Electoral precincts served as the primary sampling units (PSUs). The sampling frame was divided into three "macro-strata" by settlement type: capital, urban, and rural. The secondary sampling units (SSUs) were electoral districts, the tertiary were households, and the final unit was the individual respondent. Municipalities and rural communities were used as PSUs because they have well-defined, largely permanent administrative borders and well-defined, heterogeneous populations. Moreover, the available census information on each sampling unit was useful in constructing the sampling frames. SSUs were selected with probability proportional to the adult population size according to census information. Households were selected through a random route method: from a randomly selected starting point within an electoral district, interviewers applied the "left hand" rule, turning left at junctions, to select the households. Within a household, a survey respondent was selected using the Kish (1949) procedure. Widely used in survey research, the Kish procedure involves constructing a list of eligible individuals in a household, ordered by age and then selected according to the address serial number, so that each individual in a household has an equal chance of selection. Professional interviewers trained by CRRC conducted each household interview. The response rate was 83%.

Measures

Urban-ness. Interviewers determined the household's location: in the capital (2), an urban regional city (1), or a rural location (0). Urban regions in post-Soviet countries are defined as settlements with more than 10,000 residents, the majority of whom are not employed in agriculture (Buckley, 1998); a capital city is the country's capital.

Age. Respondents were asked to report their age.

Economic well-being. The economic well-being measures used in this study are what Boarini and Mira (2006) call objective satisfaction of basic needs. Rose (2002) describes the particular deprivation scale used here, which was based on a scale used in the New Russian Barometer. Respondents were asked, "What phrase best describes your family's financial situation?" and given five choices.

Education. Respondents were asked to self-report their education level as one of six categories, noted in Table 4.

English. Respondents were asked, "What is your English language knowledge?" and chose one response: advanced (4), intermediate (3), beginner (2), or no basic knowledge (1).

Transnational family status. Respondents were asked, "Do you have a family member or close relative currently living abroad, outside the borders of Armenia?" and responded yes (1) or no (2).

Internet frequency. Respondents were asked, "How often do you use the Internet?" Their coded responses were: I don't know what the Internet is (0), never (0), less often than once a month (1), at least once a month (2), at least once a week (3), and every day (4).

Device ownership. Respondents were told: "Now, I will read you a series of household items. Please note that we are only interested in items that your household owns and that are in normal working order. Please tell me whether or not your household owns [item]." Amongst other items, the respondents were asked if they owned a personal computer (including laptops), a mobile phone, activated Internet access from a personal mobile phone, and Internet access from a home computer. The variable for "Internet connection" was created from the mobile Internet and home computer Internet items.

Internet Activities

Respondents were asked, "Which of the following do you do most frequently when you are browsing the Internet?" and given a card listing these activities: receive/send e-mails, use Facebook, use SNSs other than Facebook (e.g., Odnoklassniki), engage in forum discussions, write a blog / read others' blogs, search for information (Google, Wiki, etc.), shop, use Internet banking, read / listen to / watch news outside of SNSs, listen to / watch music/videos/movies, use instant messenger (e.g., Skype), play online games, visit dating websites, and other. Table 4 summarizes the descriptives.

Results

Preliminary Analysis

Table 4. Description of the Sample.

Variable	Total
N	2,365
Gender	
Male	44.9%
Female	55.1%
Region	
2 Capital	38.8%
1 Urban	31.6%
0 Rural	29.6%
Close family member living abroad	68%
Education	
1 No primary education	0.8%
2 Primary education	3.3%
3 Incomplete secondary education	9.1%
4 Completed secondary education	31.2%
5 Secondary technical education	26.3%
6 Incomplete higher education	4.5%
7 Completed higher education	23.9%
8 Postgraduate	0.9%
	M = 4.92 *SD* = 1.48
Best description of family's financial situation (material deprivation)	
1 We don't have enough money even for food	35.7%
2 We have enough money for food but not for clothes	32.3%

3 We can buy food and clothes, but not more expensive things	26.9%
4 We can buy some expensive things like a TV or washing machine	3.8%
5 We can buy anything we want	1.5%
	M = 2.03 *SD* = 0.95
Age	*M* = 48.53 *SD* = 17.86
English	
1 No basic knowledge	63.6
2 Beginner	17.6
3 Intermediate	14.9
4 Advanced	3.9
	M = 1.59 *SD* = .88
Own PC	39.5%
Own mobile phone	91.5%
Own Internet	44.7
Own PC Internet	34.6%
Own mobile Internet	21.5%
Internet frequency	
0 Never	60.3%
1 Rarely	4.7%
2 Monthly	2.5%
3 Weekly	8.1%
4 Daily	22.1%
	M = 1.25 *SD* = 1.72
Regular participation in Internet activities	
E-mail	9.9%

Facebook	5.8%
Other SNS	14.5%
Forums	0.5%
Read/write blogs	0.5%
Search for information	18.8%
Shop	0.4%
Banking	0.5%
News	7.6%
Music/videos	6.6%
IM/Skype	15.1%
Games	5.0%
Dating sites	1.1%

Results of Means Comparison

Independent sample t-tests were conducted to determine whether there were any significant differences between transnational families and nontransnational families. Table 5 shows the results. Transnational families used the Internet more frequently than families not affected by migration. As for ownership, compared to nontransnational families, transnational families were generally more likely to own a personal computer and have an Internet connection. And whereas transnational families and nontransnational families did not differ in PC-based Internet ownership, transnational families were more likely to own a mobile Internet connection, even though the two types of families did not differ in mobile phone ownership. Regarding Internet activities, there was no difference between transnational and nontransnational families in use of e-mail, Facebook, or other SNSs, but transnational families were more likely than nontransnational families to use Skype.

Table 5. T-Tests.

	Transnational family		Nontransnational family		*T*	*Df*	*P*
	Mean	SD	Mean	SD			
Internet frequency	1.40	1.76	.94	1.57	5.97†	2307	.000
					6.23	1617	.000
PC own	.44	.497	.34	.476	4.32†	2273	.000
					4.39	1438	.000
Mobile own	.93	.250	.91	.281	1.68†	2333	.094
					1.61	1300	.109
Internet own	.48	.500	.37	.483	5.24†	2362	.000
					5.30	1526	.000
PC Internet own	.89	.318	.85	.355	1.36†	929	.173
					1.29	392	.197
Mobile Internet own	.25	.434	.20	.403	2.46†	2147	.014
					2.53	1382	.011
E-mail	.25	.433	.32	.466	-1.93†	872	.054
					-1.86	350	.064
Facebook	.16	.365	.15	.354	.42	875	.673
Other SNS	.41	.491	.35	.479	1.42†	875	.155
					1.44	382	.150
Skype	.45	.498	.29	.456	4.06†	875	.000
					4.25	404	.000

†*Levene's test for equality of variances was significant, so both t values and df are reported.*

However, multivariate analysis is required to understand the relative influence of demographic factors that affect both transnational family status and ICT use.

Results of Multivariate Analysis

As all of the dependent variables except for Internet frequency were binary, we opted to use linear regression to examine the impact of the independent demographic variables and transnational family status on Internet frequency, and binary logistic regression for the binary dependent variables Table 6 presents the correlations between all variables.

Table 6. Correlations.

	Urban-ness	Age	Economic well-being	Edu-cation	English	Migrant family	Internet Fre-quency	Own PC	Own mobile	Own Inet	Own PC Inet	Own mobile Inet	E-mail	Facebook	Other SNS	Skype/ chat
Urban-ness		.04	.17***	.36***	.28***	−.04*	.30***	.36***	.00	.26***	.13***	.09***	.20***	.13***	−.14***	−.01
Age	.04		−.15***	−.19***	−.37***	−.05*	−.47***	−.20***	−.31***	−.32***	−.14**	−.25***	−.09**	−.11**	−.13***	.08*
Economic well-being	.17***	−.25***		.30***	.30***	.08***	.36***	.40***	.19***	.36***	.07*	.15***	.12***	.09**	−.08*	−.03
Education	.36***	−.19***	.30***		.43***	.06**	.41***	.36***	.14***	.32***	.14***	.11***	.13***	.10**	−.17***	−.04
English	.28***	−.37***	.30***	.43***		.05*	.47***	.35***	.15***	.32***	.14***	.17***	.19***	.18***	−.07*	−.09**
Migrant family	−.04*	−.05*	.08***	.06**	.05*		.12***	.09***	.04	.11***	.05	.05*	−.07*	.02	.05	.14***
Internet frequency	.30***	−.47***	.36***	.41***	.47***	.12***		.61***	.17***	.64***	.38***	.28***	.18***	.15***	.13***	−.06
Own PC	.36***	−.20***	.40***	.36***	.35***	.09***	.61***		.21***	.75***		.18***	.09**	.07*	−.07	.09**
Own mobile	.00	−.31***	.19***	.14***	.15***	.04	.17***	.21***		.23***	−.04		−.04	.01	.04	−.03
Own Internet	.26***	−.32***	.36***	.32***	.32***	.11***	.64***	.75***	.23***		.86***	.58***	.06	.05	.14***	−.00
Own PC Internet	.13***	−.14**	.07*	.14***	.14***	.05	.38***		−.04	.87***		.08*	−.06	.05	.05	.07
Own mobile Internet	.09***	−.25***	.15***	.11***	.17***	.05*	.28***	.18***		.57***	.08*		.06	.00	.12***	−.11**
E-mail	.21***	−.10**	.12***	.11**	.19***	−.07	.18***	.09**	−.04	.06	−.06	.06		.26***	.01	−.22***
Face-book	.13***	−.20**	.09**	.12***	.18***	.01	.15***	.07*	.01	.04	.05	.00	.26***		.08*	−.16***
Other SNS	−.14***	−.30***	−.08*	−.16***	−.07*	.05	.13***	−.07*	.04	.15***	.05	.12***	.02	.08*		−.20***
Skype	−.00	.21***	−.03	−.04	−.09**	.14***	−.06	.10**	−.03	−.00	.07	−.11**	−.22***	−.16***	−.21***	

* $p < .05$; ** $p < .01$; *** $p < .001$.

Linear Regression

A linear regression was conducted to determine the effect of demographics as well as transnational family status on Internet use frequency. Table 7 presents the linear regression between the explanatory and dependent variables for the first research question. The linear regression shows that transnational family status had a small but significant effect on Internet use frequency. However, family status affected this frequency less than did owning an Internet connection, age (negatively), owning a personal computer, English proficiency, educational attainment, and urban-ness. Economic well-being had no effect. These variables explained 58% of Internet frequency.

Table 7. Overall Linear Regression on Explanatory Variables.

Explanatory Variables	Internet Frequency
Urban-ness	.06***
Age	–.25***
Economic well-being	.03
Education	.11***
English	.13***
Transnational family	.04**
Own PC	.22***
Own Internet	.29***
Adjusted *R2*	.58
F	374.842***
Df	8

* $p < .05$; ** $p < .01$; *** $p <$. 001. Values are standardized Betas.

Binominal Logistic Regression

A binominal logistic regression was conducted to reveal the effect of demographics as well as transnational family status on binary dependent variables of personal computer ownership, mobile phone ownership, Internet connection ownership, PC Internet connection ownership, mobile Internet ownership, e-mail use, Facebook use, other SNS use, and Skype use.

In the means comparison, transnational family status affected several binary dependent variables: ownership of PC, ownership of an Internet connection, mobile Internet connection ownership, and Skype use. Transnational family status did not matter for the binary dependent variables of mobile

phone ownership, PC Internet connection, e-mail, Facebook, and other SNS use. The tables present results for all of the dependent variables, but only the dependent variables for which transnational family status matters (based on the earlier means comparisons) will be discussed in the results section.

Tables 8 and 9 report the un-standardized binominal logistic regression coefficients. A positive coefficient, when significant, indicates the effects of the corresponding variable on the logarithmic likelihood of owning something or engaging in an activity.

In the multivariate analysis of the relative influence of demographic factors—such as wealth—that both contribute to transnational family status as well as Internet use influenced only Internet connection ownership and Skype use; it had no effect on PC ownership. It was already known from the means comparison that mobile phone ownership, PC Internet connection, and e-mail, Facebook, and other SNS use were not significantly different between transnational and nontransnational families; however, results for these are provided in the tables. The results for each dependent variable are presented below.

PC Ownership

Transnational family status had no significant effect on PC ownership in the binary logistic regression. Economic well-being, English proficiency, educational attainment, and age (positively) had a significant effect on PC ownership. Urban-ness and owning an Internet connection had a statistically significant effect on PC ownership, but the odds ratio did not indicate a strong effect. The variance explained by these variables was 69%.

Internet Connection Ownership

In the logistic regression model, transnational family status significantly affected Internet connection ownership, although the odds ratios did not indicate a strong effect. Economic well-being, English proficiency, and educational attainment were all significant predictors of Internet connection ownership. Urban-ness and age were significant predictors, but the odds ratio did not indicate a strong effect. This model explained 33% of the variance in Internet connection ownership.

Mobile Internet Connection Ownership

In the logistic regression model, being in a transnational family had no significant effect on mobile Internet ownership. Indeed, the only significant predictor was economic well-being. Age was statistically significantly negatively related to mobile Internet ownership, but the odds ratios did not indicate a strong effect. This model explained 12% of the variance in mobile Internet ownership.

Skype

In the logistic regression model, being in a transnational family had a statistically significant effect on Skype use, but the odds ratio did not indicate a strong effect. Age (positively) had a strong effect. Educational attainment (negatively) had an effect, but it was not strong according to the odds ratios. Urban-ness, economic well-being, English-language proficiency, and owning an Internet connection had no effect. Only 9% of the variance in the model was explained.

Table 8. Binary Logistic Regression (on Binary DVs).

	Own PC					Own mobile					Own Internet					Own PC Internet					Own mobile Inet				
Explanatory Variables			95% CI for Odds Ratio					95% CI for Odds Ratio					95% CI for Odds Ratio					95% CI for Odds Ratio					95% CI for Odds Ratio		
	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper
Urban-ness	.68*** (.092)	54.69	.42	.51	.61	−.29* (.119)	5.80	1.06	1.33	1.68	.45*** (.064)	55.28	.55	.62	.70	.34* (.136)	6.3	.55	.71	.93	.13 (.072)	3.09	.77	.88	1.02
Age	.02*** (.004)	20.07	1.01	1.02	1.029	−.07*** (.007)	103.73	.92	.93	.95	.03*** (.003)	91.08	.97	.97	.98	−.02* (.007)	6.49	.97	.98	1.00	−.03*** (.003)	83.8	.96	.97	.97
Economic well-being	.57*** (.080)	51.22	1.512	1.77	2.066	.73*** (.134)	29.58	1.59	2.07	2.70	.57*** (.056)	102.47	1.578	1.76	1.964	.08 (.076)	.43	.861	1.08	1.35	.19** (.060)	10.3	1.08	1.21	1.36
Education	.19*** (.054)	12.51	1.09	1.21	1.34	.11 (.063)	2.93	.98	1.11	1.26	.22*** (.039)	32.8	1.16	1.25	1.35	.15 (.078)	3.7	1.00	1.16	1.36	.05 (.045)	1.18	.96	1.05	1.15
English	.29** (.093)	9.37	1.11	1.33	1.60	.56* (.224)	5.20	1.13	1.75	2.71	.25*** (.066)	13.2	1.13	1.28	1.46	.19 (.136)	2.0	.93	1.21	1.58	.09 (.067)	1.62	.96	1.09	1.24

Migrant family	−.18 (.152)	1.47	.62	.83	1.12	−.10 (.185)	.30	.63	.91	1.30	−.42*** (.106)	15.7	.54	.66	.81	−.28 (.225)	1.6	.49	.75	1.17	−.18 (.120)	2.4	.66	.83	1.05
Own PC																									
Own Internet	−.38*** (.158)	470.82	.02	.02	.03																				
Constant	−.85 (.465)	3.31		.43		3.569*** (.745)	22.95		35.48		−.44 (.331)	1.78				2.07** (.712)	.71				−.21 (.368)	.32		.81	
Pseudo R2 - Nagelkerke	.69					.29					.33					.08					.12				
Chi-square/df	10.544/8					5.695/8					7.864/8					14.246/8					14.401/8				
N	2,222					2,365					2,365					2,365					1,449				

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 9. Binary Logistic Regression (on Binary DVs).

	E-mail					Facebook					Other SNS					Skype				
			95% CI for Odds Ratio					95% CI for Odds Ratio					95% CI for Odds Ratio					95% CI for Odds Ratio		
Explanatory Variables	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper	B (SE)	Wald	Lower	Odds ratio	Upper
Urban-ness	.70*** (.136)	26.34	.38	.50	.65	.55** (.163)	11.3	.42	.58	.80	–.17 (.110)	2.36	.954	1.184	1.469	.03 (.107)	.08	.79	.97	1.20
Age	–.02** (.006)	8.05	.97	.98	.99	–.06*** (.010)	36.55	.93	.94	.96	–.05*** (.006)	67.02	.94	.95	.96	.03*** (.005)	34.0	1.02	1.03	1.04
Economic well-being	.17 (.092)	3.29	.99	1.18	1.42	.08 (.113)	.49	.87	1.08	1.35	–.25** (.086)	8.64	.66	.78	.92	–.01 (.080)	.011	.85	.99	1.16
Education	.05 (.070)	.61	.92	1.06	1.21	.22* (.089)	6.31	1.05	1.25	1.49	–.10 (.064)	2.31	.80	.91	1.03	–.13* (.061)	4.29	.78	.88	.99
English	.22* (.090)	5.12	1.05	1.25	1.49	.16 (.108)	2.13	.95	1.17	1.45	–.21* (.084)	5.92	.69	.81	.96	–.04 (.081)	.235	.821	.96	1.13

Migrant family	.30 (.184)	2.70	.94	1.35	1.94	–.09 (.235)	.15	.58	.91	1.45	–.14 (.179)	.59	.61	.87	1.24	.71*** (.177)	16.2	.35	.49	.70
Own PC																				
Own Internet	.24 (.252)	.92	.78	1.27	2.09	.12 (.313)	.15	.61	1.13	2.09	1.07*** (.550)	19.01	1.798	2.90	4.689	.111 (.210)	.278	.741	1.117	1.684
Constant	–.82 (.581)	.581		.440		–.82 (.730)	1.29		.44		1.942*** (.550)	12.46		6.97		–.65 (.508)	1.63		.52	
Pseudo R2 - Nagelkerke	.13					.16					.20					.09				
Chi-square/df	13.826/8					11.324/8					5.209/8					16.828/8*				
N	2365					2365					2365					2365				

p <. 05; ** *p* <. 01; *** *p* <. 00.

Discussion

The hypotheses that compared transnational families with nontransnational families were generally supported in that transnational families' frequency of Internet use, ownership of a PC, subscribing to ownership of an Internet connection in general, subscribing to a mobile Internet connection and ownership, and the use of Skype presented a statistically significant difference in means compared to nontransnational families. However, results indicating lack of statistically significant difference between the two groups in terms of mobile phone ownership, PC Internet connection, e-mail, Facebook, and other SNS use did not support some hypotheses. This indicates that transnational family status influences the use of particular ICTs in Armenia.

However, in the multivariate analysis of the relative influence of demographic factors that impact both transnational family status and ICT use, transnational family status did influence Internet use frequency, Internet connection ownership, and Skype use. However, transnational family status had no effect on PC ownership, mobile phone ownership, PC Internet connection ownership, mobile Internet connection ownership, e-mail, Facebook use, and other SNS use.

That transnational family status mattered only for Internet frequency, connection ownership, and Skype use is not entirely surprising. If Diminescu's (2008) connected migrant requires tools to virtually inhabit multiple spaces that allow for reliable access to share and receive pertinent information, then an Internet connection, frequent use, and a means to communicate (Skype) are all she or he needs. Generally speaking, the stability provided by owning an Internet connection allows for a stronger social glue (as Vertovec, 2004 refers to it) between transnational family members in that the ability to connect to the Internet at any given time may reflect a family's desire to contact a family member who is abroad with minimal barriers. Similarly, having this connection available affords options to make contact frequently, which may assist in maintaining a sense of presence despite the family member's geographical distance.

Skype is especially relevant: the ability to make low-cost international calls and the simple interface make Skype the quintessential social glue for virtual connectedness. Additionally, unlike past ICTs, Skype has a visual register that, as Francisco (2013) argues, "allows for different relationships and care work to emerge in the transnational context" (p. 4), especially with regard to establishing or maintaining a sense of intimacy. The real-time and multimodal aspects of the software (i.e., visual/nonverbal cues, real-time video and audio feeds) allow for a more seamless, media-rich interaction than the synchronous nature of text-based ICTs (e.g., e-mail). These aspects may support Licoppe's (2003, 2004) argument that the use of ICTs such as mobile Internet offers a lower threshold for interpersonal interaction than this media-rich software. The multimodal signals that Skype supports may generate a more substantial feeling of connected presence then its communication alternatives. Further, Skype can create "ambient co-presence" (as Bacigalupe & Cámara, 2012 describe it). Francisco (2013) noted that it was not unusual for families to leave Skype on all day long, regardless of whether anyone was at the computer communicating with someone on the other end, which also reflects the low cost of making International calls via the software. Francisco's (2013) observation of a transnational family dinner

illustrates just how much Skype can provide co-presence, or present absence, the incorporation of absent people into face-to-face interactions through technology (Wellman & Rainie, 2012):

> It's ok, because she's here now. I'm again surprised, confused about what she means. But a couple of moments later I understand, because Nanay Vickie is now present via Skype. . . . Everyone has a place around the table and they make sure to leave a space in between me and Dianne so that the computer is facing the food and that Vickie, all the way away in New York City, can join us. (Francisco 2013, p. 2)

There are explanations for transnational family status not influencing other ICTs. For example, mobile phone ownership is quite widespread in Armenia, where 92% of the population owns a mobile phone, so it is unsurprising that transnational family status did not have a significant effect. Similarly, this status's lack of influence on PC-based Internet may be best explained by the rapid growth of PC Internet in Armenia over the past few years. Levels of PC adoption went from 15% to 27% to 40% of households in three years. Similarly, household Internet penetration went from 6% to 19% to 35% in the same period. Other factors are doubtless in play. Affordable netbook computers, the continually dropping cost of Internet, and the growth of popular SNS have all impacted the prevalence of PC Internet in Armenia. Thus, transnational family status's lack of impact is perhaps more an effect of the influence of other factors.

With regard to activities, families that do not need to make international calls or have visual contact with faraway members would certainly not find Skype as useful. On the other hand, the qualities of e-mail and SNSs appeal to a wider variety of people. The importance of these activities may reflect a motivation to use such tools to maintain local ties as much as to make contact with people abroad**.**

A complementary qualitative study to better understand motivations for Internet ownership, use, and activities would certainly provide greater insight into this phenomenon. Additionally, availability of currently lacking data on *when* the migration occurred or *how* close the migrating family member is could influence results by demonstrating different preferences in frequency of communication.

Future Research

The current study investigated only the effect of transnational family status on ICTs. Future research should examine the mechanisms by which the effect occurs. This could be a process-based phenomenon that coincides with (and perhaps alters) the psychological effects of transnational familyhood. Furthermore, how present *is* absence presence? For example, can one fully parent via Skype? How does connected presence impact homecoming for a labor migrant? Qualitative work is needed to answer such questions.

Conclusion

Armenians greatly value family ties, and the large proportion of the population that lives in transnational families uses ICTs to maintain these ties. Further, the transnational family status that affects

some ICT use may also influence household and national ICT use in Armenia. Notably, use of ICTs is higher in Armenia than in similar post-Soviet countries with comparable economic environments. Moreover, as maintenance of connections within transnational families has been shown to have positive social effects (Bryceson & Vuorela, 2002), ICT use may lessen the negative effects of labor migration on Armenian households and society. As mentioned above, labor migration affects mostly median-income households. Therefore, we can argue that the economic benefits of labor migration, though perhaps not sustainable on a national level, do have positive attributes on a familial level. If virtual co-presence can allow a transnational family member to participate in family life from a distance, might the economic benefits of labor migration mitigate concerns about its negative effects in part because the absence is not felt as much? Labor migration generates stress on familial connectedness, but ICTs can ease this strain by allowing distant family members to participate in day-to-day life through technology. Use of ICTs to counter the families' physical fragmentation creates a virtual, yet physical, integration of absent family members, which in turn may generate a psychological effect that helps the "left behind" cope with the distance. Finally, this study is noteworthy in that it focuses on the family rather than the migrant himself.

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