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# The digital dilemma: L1 and L2 technology use, language learning, and motivation among US university students studying abroad

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The study abroad (SA) experience now involves increased learner access via technology to the home (in the L1) and to the host culture (in the L2). L1 technology use could detract from host culture integration and language learning by allowing SA participants to remain immersed in the L1, while L2 technology use could aid in host culture integration by connecting participants to L2-speakers. Given this, it is urgent to determine the nature of the impact of L1 and L2 technology use abroad on motivation, language gains, and host culture integration. In the present study, we analyzed daily technology logs, learner motivation and L2 gains, and guided reflections on host culture engagement and L2 learning goals by 11 U.S. university students studying abroad in Argentina. Motivation and L2 abilities increased significantly, and were significantly correlated. Also, L1 and L2 digital contact showed important qualitative relationships with motivation and host culture integration.

**Keywords:** L2 Spanish, study abroad, technology, host culture integration, second language learning, motivation

## 1. Introduction

One of the promises of a study abroad (SA) context for language learners is that it will provide a language-immersive experience that enhances second language (L2) abilities, L2 motivation, and opportunities to engage with the host culture. Previous research has shown strong relationships among these three factors in a SA context such as how motivation positively affects language gains and host culture integration, which in turn increase motivation. Yet, the contexts of SA are constantly changing, and these changes may not always be advantageous for the aforementioned promises. Certain information technologies provide students in a SA context the safety net of remaining ‘virtually at home,’ as Kinginger (2013) warned. These information technologies can potentially disconnect the student learner from SA’s language-immersive experience, threatening these three aforementioned aspects of SA.

At present, there is not sufficient empirical research confirming or disconfirming the potential deleterious effects of technology use for study-abroad language learners. The enhanced L1 connectivity provided by these networks may have a negative effect on the connections that a SA student could make with the host culture, taking away from the benefits of immersion. Thereby, it is tempting to hypothesize that these technologies negatively affect student motivation, L2 language gains, and host culture integration. While some previous research has found negative correlations between social media or Internet use and language gains (Magnan & Lafford, 2011; Seibert Hanson & Dracos, 2016), this is not sufficient evidence to conclude that

L1 technology use is the cause of decreased language gains, motivation, and host culture integration. In fact, a survey done by Mikal and Grace (2012) indicates that the Internet may be a means through which learners can access social support, potentially increasing integration while abroad. Moreover, there is little research to date that thoroughly looks at the effects of technology use in the L2 and its potential impact on these three important aspects of SA.

Responding to this need for more empirical research, the present study investigates the relationships among L1 and L2 technology use during SA with motivation, language gains, and host culture integration. Specifically, we designed and implemented a daily technology log to track connectivity in the L1 and L2 that participants submitted online along with periodic written reflections about their goals and host culture integration experiences while studying abroad in Mendoza, Argentina. We triangulated our data by measuring motivation and language gains quantitatively during the sojourn to afford a more thorough examination of these interrelationships.

## **2. Literature review**

### **2.1 Motivation and L2 language gains**

Based on an extensive body of research, a learner's desire to acquire the L2, which we refer to here as L2 motivation, has been claimed to be the strongest and most consistent predictor of success in SLA (see Lasagabaster, Doiz, and Sierra, 2014). Thus, assessing learners' motivation will inform our investigation of L2 gains. Multiple theories have been posited to account for motivation with no one theory encompassing all its facets. For example, the socio-educational model by Gardner (1985) defines and accounts for both 'integrative motivation', the desire to belong in a group and identify with the L2 community, and 'instrumental motivation,' the utilitarian use of the L2 for personal gain (Gardner & MacIntyre, 1991). The Attitude/Motivation Test Battery (AMTB) was created to test these types of motivation. In the present study, we are concerned with a specific L2 context in which learners are integrating into a native-speaker community. Thus, Gardner's integrative vs. instrumental theory (and its associated measure (AMTB)) most appropriately captures the present population's motivations.

Multiple studies of L2 motivation have incorporated adaptations of the AMTB (e.g., Baker & MacIntyre, 2000; Gardner, Day, & MacIntyre, 1992; Gardner & MacIntyre, 1991; Gardner, Tremblay, & Masgoret, 1997; Tremblay & Gardner, 1995). The reliability and validity of the AMTB have also been tested and supported (Gardner & MacIntyre, 1993a). Beyond the AMTB, other quantitative measures such as the questionnaires used in Taguchi, Magid and Papi (2009), Papi (2010) and Islam, Lamb, and Chamber (2013) (see also Dörnyei & Ushioda, 2009) have been used to draw conclusions on motivation and language gains. These measures are in line with a different theory of motivation, Dörnyei's (2009) L2 Motivational Self System (L2MSS). This cognitive psychology theory was developed by building on Gardner's model, addressing issues such as the failure of Gardner's model to account for the dynamic nature of motivation. The L2MSS also has been primarily used to account for the unique situation of learning Global English as an L2, where the community of speakers is diverse in abilities, located worldwide, and often learners have no contact with native speakers.

Drawing on the seminal conceptualization of motivation as integrative or instrumental by Gardner (1985), Ushioda (1996) put forth a dynamic concept of motivation. For example, motivation can change across a time span, with language achievement having reciprocal

influence on motivation (Ushioda 1996; Gardner & MacIntyre, 1993b). Indeed, Ushioda (2001) found that proficiency gains positively influence motivation. Also, Norton Peirce (1995) conceptualized motivation as ‘investment,’ defined as a relationship with the target language that fluctuates over time. The investment model accounts for the fluctuating nature of this relationship. To add the dimension of time to our analysis, we asked participants after the sojourn to fill out a questionnaire about their continued study of Spanish and contact with the host culture. These data were gathered as another measure of a more dynamic conceptualization of L2 motivation.

L2 motivation has been shown to be connected with language gains in a SA context as well. Often and perhaps primarily those learners who have high motivation choose to study abroad. Examining motivation in this context, Willis Allen (2013) followed three highly motivated U.S. university students over several years, including during their 6-week sojourn abroad, and found that their motivation was not just maintained but enhanced by a SA experience. Moreover, L2 motivation has a strong relationship with student engagement with the host culture. Hernández (2010) found a correlation between motivation to learn the L2 (measured by a motivation index based on Gardner, 1985) and interaction with the L2 culture during SA (including e-mail and Internet use in the L2). Although Hernández (2010) did not ask participants about their L1 technology use, it is one of few studies to include motivation and interaction with L2 culture in the investigation of L2 proficiency gains while abroad. Additionally, Isabelli-García (2006) found that learners with initially higher L2 motivation were more likely to develop L2 social networks, which in turn, resulted in higher proficiency gains.

## **2.2 L2 language gains and host culture integration**

Although the general belief is that SA will improve L2 proficiency, not all research has shown this. Lafford (2006) suggested that learners may only be abroad long enough to begin to reorganize their interlanguage systems, and could end the program still in that low point of restructuring their L2 knowledge. Later research has consistently defined some specific areas in which SA learners have shown gains, primarily in relation to the degree of contact experienced with speakers of the L2 and increased host culture integration. For example, Isabelli-García (2006) and Dewey (2008) found greater gains in L2 vocabulary by SA participants as opposed to at-home learners, attributing these gains to greater language contact and interaction. Kinginger (2009) found that SA enhances sociopragmatic abilities such as being able to employ speech acts, politeness markers, and conversation openers and closers, which are not often taught in the classroom. She concluded that increased social interaction with speakers of the L2 in the case of SA allows learners to discover and use these abilities. Taguchi (2008) also found correlations during SA between the amount of self-reported L2 contact, using the Language Contact Profile (LCP) (Segalowitz & Freed, 2004), and increased speed of listening comprehension and lexical access.

Previous research supports a positive relationship between host culture integration and L2 linguistic gains. Using a modified version of the LCP (Freed, Dewey, Segalowitz, & Halter, 2004), Hernández (2010) found positive correlations between interaction with the L2 culture and L2 speaking improvements. Specifically, the amount of L2 interaction was strongly related to the participants’ housing situation in that those who lived with a host family showed greater L2 interaction and more proficiency gains than those who lived in apartment-style housing. Especially in the case of SA, according to DeKeyser (1991), individual differences in the amount

of L2 interaction impact language gains. Qualitative results from DeKeyser (1990, 1991) show two SA students differed significantly in the type of exposure they received and in their interaction with native speakers, which then affected their L2 use in differing ways and amounts. Isabelli-García (2006) found that learners who developed L2 social networks showed higher proficiency gains. Dewey (2008) attributed greater gains in L2 vocabulary to greater language contact and increased amount of time spent writing in the L2 for SA participants as opposed to participants who took L2 courses at home. Dewey, Brown, Baker, Martinsen, Gold, and Eggett (2014) tested participants studying abroad at the end of the sojourn on their amount of language use, which they argued is directly related to language gains, using a Study Abroad Social Interaction Questionnaire (SASIQ) to test the density of social networks participants established. Participants also completed a language log every day for one week during their sojourn to document amount and type of L2 use based on in-class versus out-of-class situations. The SASIQ revealed that social network size, measured by the number of native-speaker friends reported, positively predicted out-of-class L2 use. In sum, strong and reciprocal relationships have been demonstrated in previous literature among language gains, L2 motivation, and host culture integration in a SA context. Each of these variables plays a key role in a SA experience.

### **2.3 Technology use in a SA context**

Considering multiple contexts of SA, the previously mentioned studies show the importance of language contact for L2 development. This is not a novel result in other contexts, however. In fact, there is evidence from researchers from various theoretical backgrounds such as R. Ellis (2008) and N. Ellis and Collins (2009) that the frequency and amount of input predict language acquisition in general. The potentially increased amount of contact and input that a SA context provides is thus crucial to examine. Most recently with the ubiquity of technology in our daily lives, it has become imperative to also take into account the influence of L2 contact via technology on language outcomes during SA. As shown above, the degree of connectivity with the home and host cultures in an individual's SA experience is important to investigate because the level of student involvement in the host culture may have a direct effect on language development (e.g., Back, 2013; Hernández, 2010; Segalowitz & Freed, 2004; Tan & Kinginger, 2013). In other words, if we assume that a SA context affords learners more L2 connectivity as well as L2 contact time, which has been shown to be crucial in language gains, then the relatively recent increased connectivity of L2 learners abroad with their home and L1 via the Internet and technology becomes impossible to ignore. We review here the few studies that have heeded the call from Kinginger (2013) to take into account how SA experiences are now different in the age of technology and discuss what is still left unanswered by the research.

Dewey (2008), employing the LCP at the beginning and end of his study, found that the more time that learners in a SA setting spent using the Internet and writing e-mail in both the L1 and L2, the fewer L2 vocabulary gains they showed and that those participants who spent more time using the Internet failed to form strong social networks in the L2. Those learners who spent more time speaking the L2 in face-to-face interactions showed more L2 vocabulary gains. Although not testing for linguistic gains directly, Coleman and Chafer (2010) administered a questionnaire to 42 learners from the United Kingdom who had worked abroad in Senegal about their use of the Internet and email. The researchers found a moderately strong positive correlation between initial homesickness and reported Internet usage (presumably in the L1) for these participants. However, the authors could not conclude based on their data if electronic

contact with home reduced the participants' sense of immersion in the host culture or had an impact on language gains. Finally, Seibert Hanson and Dracos (2016), using the LCP, found that greater linguistic gains were correlated with less technology use in the L1 (specifically Internet-related). Additionally, lower motivation levels were associated with increased technology use in the L1 and perceptions of failure to achieve SA goals and integrate into the host culture.

It is also important to critically examine L2 technology use and any positive implication of technology in a SA context. Considering that Dewey et al. (2014) found that social network size corresponds with language contact and, thus, language gains, it is plausible that use of social-networking technologies would positively influence and facilitate language contact, host culture engagement, and language gains. Yet, there has been little research on this topic. Ranta and Meckelborg (2013) found that 17 Chinese graduate students studying abroad in Canada reported more receptive than interactive use of L2 English in their computerized logs. In other words, participants were more likely to engage in L2 activities such as reading and writing, watching movies or television, and listening to lectures, than they were to interact one-on-one with native speakers of English, thus showing one way in which technology provided access to the L2. However, Ranta and Meckelborg found no implications of their results for linguistic gains or motivation, nor did they ask participants specifically to report Internet use as its own category such that no conclusions can be made in regards to interactive technology use. Seibert Hanson and Dracos (2016) did not find any correlations between L2 technology use and linguistic gains, but the authors concluded that a more sensitive measure than the language contact questionnaire administered once at the end of the sojourn is needed to better capture participants' interaction via technology in both the L1 and L2.

In conclusion, while previous research strongly suggests positive interrelationships between motivation, language gains, and host culture engagement, there is not sufficient research on the potential impact of technology use on these variables. We have reported the reciprocal influences between L2 motivation and language gains (e.g., Gardner & MacIntyre, 2003; Lasagabaster, Doiz, & Sierra, 2014), and the reciprocal influences between L2 motivation and host culture integration (e.g., Willis Allen, 2013) and between L2 language gains and host culture integration in SA contexts (e.g., Hernández, 2010). Based on these findings, we can envision these three factors and their interrelationships. The increased availability of information technologies for language learners during SA adds a new dimension to these interrelationships, a dimension that has yet to be defined by the research. Recent research on L1 technology use (e.g., Dewey, 2008; Seibert Hanson & Dracos, 2016) invites us to infer that the use of technology to connect in the L1 has a negative influence on language gains, motivation, and host culture integration. If technology use in the L2 allows SA participants increased contact with the host culture, which may lead to greater L2 gains and motivation (e.g., Mikal & Grace, 2012), then the inclusion of L2 technology use as a crucial factor would contribute greatly to the understanding of these relationships. To this end, the present study seeks to examine the relationship between L2 technology use and (1) L2 gains, (2) L2 motivation, and (3) host culture integration. It aims to answer the following research questions:

- (1) How much are participants using L1 technology during SA, and is this usage related to L2 gains, L2 motivation, and host culture integration?
- (2) How much are participants using L2 technology during SA, and is this usage related to L2 gains, L2 motivation, and host culture integration?
- (3) To what extent did participants continue their study of the L2 and maintain

contact with their host family and friends after the sojourn?

The first two research questions derive directly from our review of the literature, while the third research question was motivated by the hypothesis that a post-sojourn reflection by the participants on their L2 motivation, host culture engagement, and use of technology would add clarity and confirmation of the results gathered during the sojourn.

### 3. The present study

#### 3.1 Participants

The participants were 11 U.S. university students ( $M_{age} = 20.18$  years; age range: 19–22; 5 who identified as male) studying in a six-week program in Argentina. They were all beginning to intermediate learners. None of the participants majoring in Spanish, although three participants were minoring in Spanish. All participants had completed at least a semester of Spanish study (some of which was taken in middle school), while five had completed at least two semesters of Spanish prior to the sojourn. Unlike in Hernández' study (2010), all participants lived with a host family. Ten of the participants identified as monolingual English-speakers and one identified as a Vietnamese-English bilingual with dominance in English. The mean for reported age of first exposure to Spanish was 10.36 years (age range: 4–20). One participant had lived three years in Honduras with family from the U.S. in an ex-patriot English-speaking community. There were no other reports of significant time spent abroad among the participants.

The participants completed a placement exam upon arrival in Argentina. Three participants were placed in Group 4 (advanced), two in Group 3 (intermediate), three in Group 2 (beginner high), and three in Group 1 (beginner low). All participants were in class at the local university from 9 a.m. until 1 p.m., Monday through Friday, studying Spanish grammar, literature, and culture with an emphasis on developing conversational skills. About one quarter of their class day was focused on conversation. Considering that there were a maximum of four students per class, a great deal of conversation and communication took place in the target language regarding classroom tasks. The curriculum was designed by the faculty of the Argentine host university and based on the text *Voces del Sur*. Students in the beginning classes used Level 1 of the text (Corpas, García, Garmendía, & Soriano, 2009), students in the intermediate class used Level 2 (Corpas, Garmendía, & Soriano, 2010), and the advanced students studied supplementary material supplied by the instructor that focused on grammar, history, culture, writing, literature, and cinema.

In addition to classes, all students participated in at least two hours of conversation at the university café with their 'conversational partners,' who were Argentine university students. Faculty supervised these conversations to ensure that participants were speaking Spanish for half of the time and English for the other half. For each meeting, participants were given a theme as a guide (e.g., discuss and compare the education systems in the United States and in Argentina). Two days a week, the participants took a two-hour tango lesson conducted entirely in Spanish with a professional Argentine tango performer. One additional afternoon a week as well as three additional weekend days, the participants went on cultural excursions with program faculty members. These excursions included city tours given in Spanish, museum or cultural heritage site visits, hiking in the mountains, and eating with traditional *gauchos* (cowboys) in the

countryside. The other two weekends were entirely free, which many spent with their host families or other native speakers they had met through the university. Although the faculty insisted on speaking only Spanish with the learners unless there was an important breakdown in communication, there was no official language policy for the program that required Spanish only. Faculty also encouraged the participants to speak only Spanish with each other. All participants adhered to this when communicating with the faculty, even though the beginners often argued that they could not. We include their self-reported use of Spanish in the Results section below.

### **3.2 Procedure**

Participants completed a language background questionnaire (LBQ) at the beginning of the program. They also completed a L2 motivation measure and a grammar and reading comprehension test at the beginning and end of their SA sojourn in order to capture potential changes. All measures were administered on paper in the university classrooms designated for SA programs and learners of Spanish. Six days a week, participants electronically reported their technology use in the L1 and L2 as well as their in-person contact with speakers of both languages for the previous day. The last week of the sojourn, participants wrote guided reflections on their experiences and integration with the host culture. A subset of the participants also responded via e-mail to a delayed survey a year and a half later on their continued use of Spanish and contact via technology with members of the host culture.

### **3.3 Materials**

#### **3.3.1 Language background questionnaire (LBQ)**

The LBQ consisted of questions about participants' age, native language, and languages spoken or studied. Additionally, participants answered questions about the contact they had had with Spanish prior to the sojourn, time spent abroad previously, and their motivations and goals for the current SA program.

#### **3.3.2 Linguistic gains: Quantitative measure**

Participants completed a pre- and post-sojourn L2 grammar and reading comprehension test to provide an independent measure from their course level placement of baseline L2 abilities and potential gains. We created two versions in order to prevent practice effects. Participants took version 1 on the first day of the sojourn and version 2 during the last week. The two versions of the L2 grammar and reading test were adapted primarily from the *Diploma de español como lengua extranjera* (DELE) exam (DELE, 2017), with additional grammar items used from the brief grammar proficiency test administered in Dracos (2013) and Dracos and Henry (2018). In total, there were 85 items: three grammar sections (low, intermediate, and advanced) and one intermediate-level reading comprehension section. The data from these measures were coded as total points received for each participant at each time of testing.

#### **3.3.3 Motivation: Quantitative and qualitative measures**



In order to capture L2 motivation, we administered a motivation survey in English twice during the sojourn, asked open-ended reflection questions at the end of the sojourn, and followed up with open-ended reflection questions eighteen months later. The quantitative motivation survey was a modified version of Gardner's (1985; 2004) ATMB that was created by Ushida (2003) for Spanish learners in the United States, a version of which was used in Hernández (2010) and Seibert Hanson and Dracos (2016). Items tapped into integrative and instrumental motivation constructs such as: 'Studying Spanish can be important because it will make me a more knowledgeable person,' and 'I enjoy meeting and listening to people who speak Spanish.' Participants responded to each item based on a 5-point Likert scale (1= strongly disagree; 5= strongly agree). There were 46 items in total. The negative statements ( $n= 11$ ) were reverse-scored. Responses were averaged by question and participant for analysis. After running a Cronbach's alpha test, we found that the internal consistency reliability for this measure was relatively high (Time 1 and 2  $\alpha$ s = .84, .87), thus justifying its use. Please see Appendix A for the full questionnaire. Although the AMTB has been criticized for not capturing the dynamic nature of motivation, we administered it multiple times to mitigate this drawback. We also supplemented it with qualitative data. At the second time of testing, we asked participants to respond to three directed questions on a separate sheet of paper in an open format after completing the motivation survey:

1. Do you think your motivation to learn Spanish changed over the course of the program, or do you think your motivation remained about the same since the beginning? Please explain your answer. If your motivation did change, how did it change (increase or decrease in motivation) and why?
2. Think back to the first week of your study abroad experience. Describe the objectives/goals that you had at that time for your study abroad experience. Do you feel that you met your goals for this program? Please explain your answer.
3. What was it about the study abroad experience that most contributed to your language development?

### **3.3.4 Technology use log: Quantitative measure**

Fernández and Gates Tapia (2016) tested the suitability of the often-used LCP (Freed, Dewey, Segalowitz, & Halter, 2004) in measuring participants' local engagement during SA. They found ambiguity in the items on the LCP, variation in amounts of time reported, and a lack of ability to capture the "fluctuating nature of students' local engagement in study abroad" (Fernández & Gates Tapia, 2016, p. 250). Thus, we created a technology use log that participants filled out six days out of each week on the course management system Canvas (www.instructure.com) via the smartphone application or on their personal computers. They had one day a week when they did not have to report their usage in order to attempt to reduce response fatigue. Although this log improved the number of data points from the LCP, there may still have been some inaccuracies due to lassitude in responses over time or due to the self-reported nature of the instrument, as self-reports can be flawed. The participants typed in an empty dialogue box the number of minutes and hours per day they had done the following:

- (1) spoken with native Spanish speakers in person
- (2) talked via Skype/WhatsApp/FaceTime/phone with Spanish speakers

- (3) read online or via tablet the news, novels, web pages in Spanish
- (4) read e-mail, Facebook, Twitter, texts in Spanish
- (5) watched or listened to television, movies, radio, and music in Spanish
- (6) written email, posted on Facebook, tweeted in Spanish
- (7) written texts in Spanish.

Then, participants answered the same questions about these activities in English. In all, participants responded to fourteen questions each report time. Each day that participants logged on, the same questionnaire appeared so that they became familiar with the questions being asked. To ensure consistent and truthful responses, one of the researchers regularly communicated with the participants about their responses, encouraging them to take the time to respond as accurately as possible to the questions. For analysis, the data from this measure were coded as means of the amount of time reported by question and by participant.

### **3.3.5 Guided reflection: Qualitative measure**

As part of the study abroad program, prior to departure and during the sojourn, participants learned about culture shock and the possibility of experiencing it. At the end of the sojourn, the participants wrote a guided reflection based on the following prompt:

Given that we have all experienced one or another form of culture shock during our time here in Argentina, you should explain one aspect of culture shock that made you uncomfortable, one aspect that you found surprising, and one aspect that you found valuable. Reflect on why you reacted the way you did in all three cases and discuss how these experiences may have contributed to your learning process/personal growth.

Participants were given as much time as needed to respond. All reflections were written in English. This was administered via the course management system Canvas. These responses were included in the analysis due to their potential for revealing connections with the host culture, which served to answer our research questions 1 and 2 about host culture integration.

### **3.3.6 Post-sojourn survey: Qualitative measure**

Eighteen months after the end of the sojourn, participants received a personal e-mail with the following questions included as a follow-up survey of their language learning experience, host culture integration, and technology use:

- Did you continue to take Spanish courses or study Spanish in any systematic way after returning home from the summer program? Please explain.
- Have you stayed in contact with your host family in Mendoza? If so, how do you stay in touch (e.g., What's App, Facebook, Snapchat, email, etc.)?
- Have you stayed in contact with friends you met from Argentina? If so, how do you stay in touch (e.g., What's App, Facebook, Snapchat, etc.)?

- Which specific apps/programs did you use while in Argentina to stay in contact with friends and family back home or in Argentina (e.g., What’s App, Facebook, Snapchat, etc.)?

We received replies from seven of the eleven participants. Their responses were analyzed as supplementary to their other results.

#### 4. Results

We analyzed changes in L2 grammar and reading comprehension abilities, motivation, and technology use, and ran correlations among motivation scores, L2 grammar and reading comprehension test scores, and technology use totals and by question. Following Kinginger (2009) and Fernández and Gates Tapia (2016), who underscored the importance of triangulation of data for both the variables of motivation and language contact, we analyzed individual participants’ written responses for evidence of motivation, goal completion, connectivity, and host culture integration. By grouping responses thematically, we assessed and compared levels of each of these variables by participant.

##### 4.1 Quantitative results

###### 4.1.1 L2 gains and motivation

Due to the small sample size and non-normality of the data, a non-parametric test, specifically the Wilcoxon Signed-rank test, was used to compare statistically significant differences between paired groups. Based on the analyses, participants overall showed significant L2 improvement over time (Time 1 range: 29–65; Time 2 range: 41–70;  $Z = 2.09, p = .04, r = .45$ ). Results from a Wilcoxon Signed-rank test run on motivation scores at the beginning and end of the sojourn also revealed that motivation was significantly higher at Time 2 (Time 1 range: 3.28–4.7; Time 2 range: 3.74–4.67;  $Z = 2.05, p = .04, r = .44$ ). Thus, we can conclude that L2 abilities and L2 motivation both increased over the course of the sojourn.

In order to better understand the relationship between these variables, we also ran Pearson Correlations for the L2 grammar and comprehension test and the motivation measure. Based on Plonsky and Oswald (2014), we interpreted *r-values* of .25, .40, and .60 as weak, moderate, and strong correlations, respectively. Correlations were significant and strong between the pre- and post-tests for L2 abilities ( $r(9) = .89; p < .001$ ) and moderate and approaching significance for the pre- and post-tests for motivation ( $r(9) = .55; p = .08$ ). Also, motivation scores at Time 1 and L2 test scores at Time 2 were significantly and strongly positively correlated ( $r(9) = .63, p = .04$ ), showing a relationship between initial L2 test scores and final motivation. Although motivation scores at Time 2 showed a moderately positive correlation with Time 2 L2 test scores ( $r(9) = .46; p = .16$ ), it was not statistically significant. The complete results from the correlations are in Table 1.

Table 1. Correlations among language gains and motivation for Time 1 (T1) and Time 2 (T2)

	L2 Test T1	L2 Test T2	Motivation T1	Motivation T2
L2 Test T1	-			
L2 Test T2	0.89**	-		
Motivation T1	0.57	0.63*	-	

Motivation T2	0.4	0.46	0.55	-
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\*\* $p < 0.01$   
\* $p < 0.05$ .

#### 4.1.2 Technology use

Participants reported a mean of .51 hours ( $SD = .33$ ) per day for L1 technology use during the sojourn, which included 31 days of reporting, and .26 hours ( $SD = .3$ ) per day for L2 technology use. Based on a paired samples t-test, participants reported using significantly more L1 technology than L2 technology ( $t(333) = 13.27, p < .001, d = 0.97$ ) overall. Four participants reported spending no time writing e-mail or using Facebook in the L2, one participant reported no time reading e-mail in the L2, and one participant reported never reading the news or webpages in the L2. There was also one participant who reported no time spent watching L1 movies and television, nor listening to L1 music. The reported amounts of L1 and L2 technology use may appear low overall, although with great variability, especially when comparing them to more typical technology use by U.S. university students at home. This is understandable in this context, however, since there were entire days during the sojourn in which participants used no technology at all due to being on excursions with no connectivity, such as when hiking in the mountains. Additionally, there may have been some lassitude in responses due to the almost daily requirement to report technology use.

When divided into the first half and the second half of the sojourn, we see that the participants used significantly less technology overall in the second half of the sojourn ( $t(322) = 3.53, p < .001, d = 0.39$ ), with still more L1 technology use than L2 technology use ( $t(154) = 8.3, p < .001, d = 0.82$ ). Two of the individual items on the technology log, which showed significant differences between L1 and L2 means at Time 1, were no longer significantly different at Time 2: (1) *watching/listening to tv, movies, radio, music* (Time 1: L1  $M = .43, SD = .70$ , L2  $M = 1.01, SD = 1.0$ ; Time 2: L1  $M = .69, SD = .94$ , L2  $M = .76, SD = .73$ ;  $t(156) = 0.73, p = .47, d = 0.11$ ), and (2) *writing email, posting on Facebook, tweeting* (Time 1: L1  $M = .20, SD = .44$ , L2  $M = .04, SD = .17$ ; Time 2: L1  $M = .12, SD = .82$ , L2  $M = .03, SD = .12$ ;  $t(157) = -1.51, p = .13, d = 0.17$ ). These results indicate that participants were using less technology overall, with a specific decrease in L1 e-mail, Twitter, and Facebook use. Back (2013) also found a decrease in Facebook posting by her participants in the last month of their sojourn.

Participants reported speaking a mean of 4.46 hours ( $SD = 2.52$ ) per day in English and a mean of 3.43 hours ( $SD = 1.89$ ) per day speaking in Spanish outside the classroom with native speakers. A paired samples t-test revealed that these overall amounts were significantly different from each other ( $t(331) = 5.55, p < .001, d = 0.46$ ) such that participants were using the L1 more than the L2 outside the classroom. When L1 and L2 results were combined, there was no significant difference over time in total speaking in-person outside of class ( $t(330) = -1.04, p = .3, d = 0.11$ ). This was due to participants using less Spanish ( $t(331) = 2.08, p = .04, d = 0.23$ ), and also using more English ( $t(331) = -2.81, p = .01, d = 0.31$ ) in the second half of the sojourn. Although this appears to be contrary to what we would expect, the participants were interacting with host nationals in English such that this does not eliminate the possibility of increased host culture integration, just less reported use of spoken Spanish outside the classroom. Furthermore, the participants were asked to only report use of spoken Spanish with native speakers. Thus, if they were using Spanish with each other, these hours would not be captured by the present measure.

Pearson Correlations showed a non-significant weak negative correlation between

motivation at the beginning of the sojourn and L1 technology use ( $r(9) = -.22; p = .55$ ), which became a non-significant weak positive correlation at the end of the sojourn ( $r(9) = .21; p = .58$ ). Also, we found a non-significant weak positive correlation between L2 technology use and motivation at the beginning of the sojourn ( $r(9) = .21; p = .56$ ) and a non-significant moderate positive correlation at the end of the sojourn ( $r(9) = .35; p = .33$ ). Although none of these relationships was significant, the general trend appeared to be that L2 technology use could be associated with initial higher motivation and that L1 technology use could be associated with initial lower motivation. There was no evidence here that those participants who used more technology overall, however, had lower motivation levels or fewer language gains. There was no significant correlation found between L2 test scores and technology use in either language at either time point. Next, we turn to the qualitative findings to get a more complete picture.

## 4.2 Qualitative findings

In Table 2, we have organized the data from the three open-ended questions on the motivation survey and the guided reflection responses. In the first column, the data on participants' goals gathered at the beginning of the sojourn have been analyzed for similar themes: (1) integrating with the host culture, (2) learning the L2, and (3) instrumental achievements such as school credit fulfillment. In the next two columns, we have also separated the participants' comments on perceived motivational changes throughout the sojourn and their thoughts on specific contributors to L2 development, reported at the end of the sojourn. In sections 4.2.1 to 4.2.3, we discuss these findings as well as integrating the findings from the post-sojourn survey. In section 4.2.4, we summarize the findings from the post-sojourn survey.

Table 2. Qualitative responses divided by participant

Participant*	Goals	Motivation change	L2 Development Contributors
<b>Dan</b>	Be able to speak Spanish; have conversations at a deeper level	Increased; wanted to speak with people who did not speak English	Talking to host family only in Spanish
<b>Jonathan</b>	Found program intriguing; learn Spanish; be able to communicate/survive; fulfill Spanish requirements	Increased; the more he learned, the more he wanted to learn	Class time; talking with host family and students in community
<b>Lisa</b>	Desired an immersion experience; become more comfortable speaking and improve grammar; complete Spanish minor	Strong the whole time	Class time and host family
<b>Max</b>	Desired to live and learn in a new setting and country; learn conversational Spanish; fulfill Spanish requirements	Increased; felt pressured to learn but enjoyed it	Class time; conversational partners; being forced to communicate in the city
<b>Anthony</b>	Go back to South America; learn Spanish, read <i>Harry Potter</i> in Spanish	No change; learned on survival basis; motivated by need	Communicating with host family only in Spanish

		not desire	
<b>Chelsea</b>	Desired cultural and immersive experience; make new friends; improve speaking; understand native speakers	Increased a little; still wanted to communicate more fluently	Host family
<b>Kathy</b>	Make good friends; immersion experience in a dialect familiar with; speak fluently; complete Spanish minor	Strong already	Learning structures in class; interacting with host family and in Bible study
<b>Erin</b>	Immerse self in culture; experience the country; make close friends with locals; improve Spanish	As skill level increased, became more confident and more motivated	Host family
<b>Bill</b>	Experience the culture; become fluent, “Be able to stop taking Spanish classes” (i.e., fulfill Spanish requirements)	Increased; never wanted to learn language before but now loves it	Everything, “these people changed my life!”
<b>Christina</b>	Wanted to travel to Argentina and learn culture; be more comfortable speaking with native speakers; become more confident	Increased; began thinking in Spanish and using it by default when before would have been too nervous	Full immersion
<b>Rob</b>	Interested in other cultures; desired immersion in culture; become proficient in Spanish; be a good Spanish speaker	Definitely increased	Immersion; host family

\*All names are pseudonyms.

#### 4.2.1 Goals

The goals that participants listed at the beginning of the sojourn included the desire to be immersed in a new culture, to learn in a new setting, and to make new friends. Whether these new friends were other students from the United States or people from the host community was not specified. Participants’ goals in regard to learning the L2 ranged from ‘surviving’, becoming more comfortable speaking in Spanish, to becoming fluent. With the wide range of abilities at the start of the sojourn, this is not surprising. For specific instrumental goals, participants mentioned fulfilling the language requirements at their university, finishing the Spanish minor, and being able to read a popular novel in Spanish. Participants’ written responses to the three questions at the end of the final motivation survey revealed a confidence in achieving their goals of improving their Spanish skills and in integrating with the host culture. Yet, there was one participant, Lisa, who reported to have failed to achieve her SA goals, and the details of her reasoning and situation are instructive.

*I don’t feel like I integrated into the Argentine culture a whole lot, but that was mostly a result of my own decisions. Because I don’t like being out late, drinking alcohol, or eating meat, I was never a part of a lot of the activities that even other*

*students participated in.*

Lisa expressed dismay at not being able to integrate with Argentine culture. She did not connect well with her Argentine peer groups or host family, who she stated would sometimes speak in English with her (even though the program asked that host families communicate only in Spanish with the participants). Interestingly, Lisa also exhibited lower motivation scores, showed only a slight improvement in L2 abilities, and had little to no L2 technology use for interaction purposes. In her post-sojourn survey, Lisa wrote that she changed her Spanish minor to a major and will be applying to the Peace Corps in a Spanish-speaking country, indicating a continued motivation to improve language skills and perhaps integrate more into a Spanish-speaking culture. Hence, Lisa's case indicates that there is a possible relationship among motivation, language gains, host culture integration, and technology use, a possibility we turn to discuss now.

#### **4.2.2 Motivation**

For changes in motivation, all participants but one self-reported at the end of the sojourn increased or sustained strong motivation. The one participant who reported living in survival mode and being motivated by need as opposed to desire during the 6-week sojourn, Anthony, also reported in the delayed post-sojourn survey that he acted as a spokesperson for the SA program, promoting it in Spanish language classes back at the home institution. His guided reflection revealed that his feeling of living in survival mode had positive effects, in that, "I forced myself to get uncomfortable and hang out with my only-Spanish-speaking family." It is important to note that Anthony stayed an additional three weeks in Argentina after the 6-week program, taking Spanish classes and living with the same host family. He responded to the post-sojourn survey that while he stopped taking Spanish courses after returning from Argentina, he has used the language in the workplace and has kept in contact with his host family and a few students he met at the university. Although Anthony's motivation may have been purely extrinsic in that he was learning Spanish to survive in his new surroundings at the beginning, it appears that he internalized the goals of improving his Spanish, and now feels intrinsically motivated to use and improve his Spanish abilities.

Multiple participants reported how their motivation increased as skill level increased, supporting the claim made by Gardner and MacIntyre (1993b) and reiterated by Ushioda (1996) of, "reciprocal causation between motivation and achievement" (p. 239). One participant, Bill, reported that he never set any goals and just wanted to become fluent in order to stop taking required Spanish courses. However instrumental his motivation may have been at the onset, he praised his teachers highly in his guided reflection essay at the end of the sojourn and stated that, "these people changed my life!" This same participant has since returned to Argentina multiple times, bringing his own family to meet his host family and to get to know Argentina. This is an example of the evolving goal-orientation for language learning that was highlighted by Ushioda (1996).

#### **4.2.3 L2 gains**

In regards to L2 development, all participants stated that the biggest influences on their L2 development were their time in class and time interacting with their host families. One of the two participants who scored lower on the L2 grammar and reading comprehension measure

at the end of the sojourn than at the beginning, Erin, also had the lowest amount of L2 technology use reported. She later commented in the delayed post-sojourn survey that her host mother was not technologically knowledgeable, which could partially account for using L2 technology less. Despite the apparent negative quantitative outcomes, Erin wrote in her guided reflection responses about how she felt the Argentine culture was welcoming and how she had vastly improved her language skills because of this. It could be that part of the observed welcoming nature of Argentines included a willingness to use English. Erin wrote,

*I've spoken a combination of Spanish and English with Argentines here, our mutual desire to communicate combined with their willingness to include foreigners into their daily lives has given me a more direct experience with a foreign culture than I've ever had.*

Erin also stated in the delayed post-sojourn survey that she maintained contact with Argentine friends via social media and that she continued to use smartphone applications to practice her Spanish after she graduated.

#### **4.2.4 Post-sojourn survey responses**

Of the seven participants who responded to the post-sojourn survey, four responded that they have continued to take classes in Spanish. The three participants who said they have not taken further courses stated that they have continued to use the language through smartphone language applications and with either co-workers or extended family. One also said that she stopped because she had finished the minor and did not have room in her schedule to take Spanish. Four participants responded that they still are in contact with their host families via Instagram, What's App, Facebook, or Snapchat. Only four participants said that they still kept in touch with other host community friends they met while in Argentina, while all said they still maintain contact with other participants from the United States, which shows group cohesion. As for which specific technology programs were utilized, participants reported that they had used FaceTime (iPhone), iMessenger (iPhone), Skype, Facebook, Facebook Messenger, What's App, and Viber (for texting those with Android cellphones) to keep in touch with people in the country and back home. They also reported using Snapchat and Instagram to share their adventures while in Argentina.

### **5. Discussion and conclusion**

In order to justify the inclusion of technology use in the L2 as a factor among the interrelationships of language gains, L2 motivation, and host culture integration, we discuss in this section our findings and how they answer our research questions about each interrelationship.

First, confirming previous research, we found positive reciprocal relationships between motivation, language gains, and host culture integration. We found that the majority of the participants reached their goals of integrating into the host culture. We also found robust evidence that participants' L2 reading and grammar abilities and L2 motivation improved over the course of the sojourn. Although it is possible that the participants' language gains may be solely based on their coursework and classroom interaction during the SA program since the



gains are for reading and grammar skills, L2 improvement is a significant finding in this context where the opportunities abound to use the L1 via technology. The language gains we found here could also have resulted from the participants' use of L2 technology since this involved reading and using grammar in their writing. Dewey (2008) found improvements in L2 vocabulary for SA participants who wrote consistently in the L2. The current data corroborate this since the participants completed written assignments regularly for their classes and occasionally engaged in written social media in the L2 with host culture friends.

In their guided reflection essays, eight of the eleven participants stated specifically that living with a host family was the greatest contributor to their language development. Since all these participants showed L2 gains over the course of the sojourn, this seems to corroborate Vande Berg, Connor-Linton, and Paige's (2009) finding that the amount of time spent speaking with host families predicted L2 gains. One of the two participants whose scores went down on the L2 grammar and reading comprehension test, as discussed in section 4.2.3 (Erin's case), was successful in integrating with the host culture, yet used a combination of the L1 and L2 to do this. This lesser amount of L2 use (both oral and written) outside of the classroom may account for her lack of gains as assessed by the present measure (she only scored one point lower at Time 2 than at Time 1). In the other case (Rob), there is strong anecdotal evidence that the day of the second grammar and reading comprehension test he was not the most alert, having taken advantage of the evening before by going out with local friends. Based on the qualitative data, we can conjecture that Rob and Erin also may have experienced some linguistic gains.

It is not surprising that we found that participants' motivation was high at the beginning of the sojourn since this has been shown before (e.g., Willis Allen, 2013), but we also found that motivation increased significantly over time, and qualitative enhancements in motivation were observed on the individual level. Most important, participants' motivation at Time 1 correlated positively and strongly with their language abilities at Time 2, which shows that as in previous research (e.g., Lasagabaster, Doiz, and Sierra, 2014) those participants who were most motivated also showed the greatest gains. The two participants who did not exhibit significant L2 gains on our measure did, however, show an increase in motivation over time and reported that they had fulfilled their language learning goals. Additionally, the two participants who did not exhibit an increase in motivation scores showed L2 language gains and also specifically stated in their written responses that they felt their motivation either increased or remained high throughout the sojourn. Thus, although there was quantitative evidence that overall high motivation at the outset led to greater language gains indicating a relationship between motivation and language gains abroad, all individual participants showed positive outcomes, whether they were increased motivation levels or increased language abilities, or both. Without the inclusion of the qualitative analysis, however, these nuances would not be evident.

With respect to L1 technology use, this study provides no evidence here for a view of SA participants remaining 'virtually at home.' The participants exhibited a moderate amount of L1 technology use at the beginning of the sojourn, which decreased over time. Further, although our data show that initial lower motivation corresponded with increased L1 technology use, this study cannot report any significant or strong connection between L1 technology use and motivation, language gains, and host culture engagement. Despite the ubiquity of social media technologies, the participants in this study progressed in a normal, if not ideal, manner. They arrived highly motivated, but possibly succumbed slightly to inevitable homesickness, using L1 technologies a moderate but not extreme amount. As time passed, their motivation, language abilities, and engagement with culture all increased, which corresponded with a decrease in L1

technology use. Accordingly, we conclude that the use of social media technologies is not necessarily detrimental to language development during SA.

In fact, this study suggests that social media technology use can be a positive addition to a SA context. The participants in this study who exhibited the greatest amount of host culture integration were the ones who used technology in the L2 (namely Facebook and What's App) to connect with locals they had met at the university, developing new relationships. One of the most frequent L2 technology users, Jonathan, wrote in his guided reflection that, "It was very easy to make local friends through the school [...] hanging out with these local people, plus your host family and their friends, is a huge part in fitting in." The participants even created groups on various social media platforms (to which local friends invited many of their friends) to facilitate making new friends, planning gatherings, and to pose questions related to the host culture and community. The communication on these group chats was primarily in the L2 since host culture residents were involved, although the use of the L1 may have aided in the success of the communication. Rob, the most frequent L2 technology user in the group, wrote in his reflection how through these chat groups he had easily made "many friends I hope I will be able to maintain a relationship with for many years to come as well as hope to see at some point when I return to [...] the beautiful country of Argentina." All of these interactions and planned continued interactions, although perhaps more likely to occur in a smaller city environment such as the site of the present study, seem to be more feasible with the aid of technology and social media.

Considering all the individual experiences documented here, it becomes clear that the role of technology in establishing and maintaining connectivity with the host culture can be a positive one in some aspects, especially when used in the L2. Since increased host culture integration has positive effects on language development and motivation, we argue that L2 technology use can play an important part in the relationships among motivation, language gains, and host culture integration during a SA experience.

Yet, it is important to recognize some limitations in the present study. First, this study improved upon the LCP, which has been criticized for lack of reliability because of its reliance on participants' memory and self-reports (e.g., Fernández & Gates Tapia, 2016), by including near-daily data collection throughout the sojourn. However, our data on language use and technology use still derived from self-reports and perhaps did not capture all possible realms of language use such as time speaking Spanish between the participants themselves. Second, pre- and post-sojourn oral interviews should be included, both to assess oral proficiency, since this is the area in which learners have shown the most improvement during SA (see Hernández, 2010), and to identify more fine-grained motivational changes through directed questions about their goals and motivation over time. Having multiple instances of qualitative responses on motivation would provide a more detailed trajectory over time of motivational changes, which are known to occur (e.g., Dörnyei, 2010; Norton Peirce, 1995; Ushioda, 1996). Finally, our study worked with a single group of students in a single study abroad program, which means that the findings should not be hastily generalized. Future researchers, in order to identify positive or negative effects of technology use on language gains as well as the strength of these effects in a SA context, should endeavor to work with larger participant pools and employ measures that avoid the typical problems of self-reporting and potential response fatigue due to the almost daily requirement to record usage. Perhaps having permission from learners to install an application on their smartphones that tracks all use or allowing one of the researchers to be part of the social media group chats (as Hofer et al. (2016) did with Facebook) would constitute more objective

ways to collect these data in the future.

Specifically, the findings of the present study are not sufficient to allay fears about L1 technology use in a SA context, and they are not necessarily contrary to those studies that found a negative correlation between L1 technology use and motivation as well as L2 linguistic gains. The small set of students examined here were highly motivated from the start, and they, for the most part, subsequently entered into an interrelated cycle of increased motivation, L2 language abilities, L2 technology use, and host culture integration. Thereby, it remains possible that students with lower initial motivation or students with a negative SA experience might exhibit distinct patterns of technology use and these patterns may contribute to negative learning outcomes. Future research working with a larger sample size of participants in different SA contexts is needed not only to identify the positive or negative effects of technology use on language development for the median and mean student during SA, but also to determine the different ways technology use might affect the language learning of students with different motivation and different SA experiences.

Nonetheless, the present study does suggest that the ubiquitous presence of social media technologies does not, from a language development perspective, necessarily or fundamentally alter SA contexts. Motivated students, ready to brave the many uncomfortable situations in a SA context, who subsequently experience increased motivation, host-culture integration and language gains, do not necessarily remain ‘virtually at home,’ with social media technology helping them be ‘virtually abroad’ as well. Therefore, on a practical note, educators and SA program administrators should not universally decry or discourage technology use. Instead, their efforts to cultivate a SA context that engenders increased motivation, host culture integration, and language gains should include careful consideration of particular technology uses that might inhibit and promote language development.

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Appendix A. Motivation Questionnaire items. Adapted from Ushida (2003).

Indicate your opinion about each statement by choosing the number that best corresponds to the extent you disagree or agree.

1. Studying Spanish can be important to me because it will allow me to meet and converse with Spanish-speakers.
2. Whenever visiting a foreign country I would like to be able to speak the language of the people.
3. It embarrasses me to volunteer answers in our Spanish class.
4. Learning Spanish is really great.
5. Studying Spanish can be important for me only because I'll need it for my future career
6. Spanish is really great.
7. I would like to know more Spanish-speaking people.
8. I have a favorable attitude towards Spanish-speakers.
9. I hate Spanish.
10. Studying Spanish can be important for me because it will allow me to meet and converse with more and varied people.
11. Studying Spanish can be important for me because it will make me a more knowledgeable person.
12. I never feel quite sure of myself when I am speaking in Spanish class.
13. I wish I were fluent in Spanish.
14. I wish I could speak another language perfectly.
15. The more I learn about Spanish-speakers, the more I like them.
16. I really enjoy learning Spanish.
17. Studying Spanish can be important for me because it will enable me to better understand and appreciate Spanish art and literature.
18. I always feel that the other students speak Spanish better than I do.
19. Studying Spanish is important because it will make me appear more cultured.
20. Studying Spanish is important because it will give me an edge in competing with others.
21. I want to read the literature of a foreign language in the original language rather than a translation.
22. Spanish-speakers are trustworthy and dependable.
23. I would rather spend my time on subjects other than Spanish.
24. Studying Spanish can be important for me because I will be able to participate more freely in the activities of other cultural groups.
25. Studying Spanish can be important for me because other people will respect me more if I have knowledge of a foreign language.
26. I get nervous and confused when I am speaking in my Spanish class.
27. My parents think I should devote more time to my Spanish studies.
28. The more I get to know Spanish-speaking people, the more I want to be fluent in their language.
29. I often wish I could read newspapers and magazines in another language.
30. I have always admired Spanish-speaking people.
31. Spanish is an important part of my education.
32. Learning Spanish is a waste of time.
33. I make a point of trying to understand all the Spanish I see and hear.
34. Spanish-speakers are very friendly and hospitable.
35. I would really like to learn a lot of foreign languages.
36. I plan to learn as much Spanish as possible.
37. I am afraid the other students will laugh at me when I speak Spanish.
38. I think that learning Spanish is dull.
39. I love learning Spanish.
40. Spanish-speakers are cheerful, agreeable, and good humored.
41. When I leave school, I shall give up the study of Spanish entirely because I am not interested in it.



42. I would study a foreign language in college even if it were not required.
43. I find Spanish interesting.
44. I enjoy meeting and listening to people who speak other languages.
45. Studying a foreign language is an enjoyable experience.
46. I plan to learn as much Spanish as possible.

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