Profiling mobile English language learners

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The purpose of this study was to use an app-embedded survey to profile language learner demographics. A total of 3,759 EFL language learners from primarily eight L1 backgrounds (French, German, Italian, Japanese, Korean, Russian, Spanish and Thai) responded to the survey embedded within a popular English grammar app. This app has over 500,000 downloads and over 100,000 active users. The results, significantly, showed respondents self-assessed their ability, overwhelmingly, as beginner or elementary. The data also highlighted differences in user segment size according to gender, age, and L1, as well as more nuanced patterns influenced by possible culture and gender roles. Finally, the survey data pointed towards likely areas of future demographic mobile assisted language learning (MALL) growth. While presently there is very little concrete research on autonomous mobile language learning, due to the difficulty of gathering language app data from learners not tethered to a classroom or instructor, it is hoped that this research will provide a methodological foundation for more in-depth research into learner habits and preferences.

Keywords: mobile learning, mobile assisted language learning, educational technology

Introduction

Mobile devices, particularly smartphones and tablets, have garnered much interest among language researchers in recent years due to the possibilities these MALL technologies hold for language learning (Burston, 2011; Godwin-Jones, 2011; Kukulska-Hulme, 2012). At the same time, increasing adoption of these devices among learners is making

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it easier to realize this potential. For example, looking at 2012 smart-phone penetration alone, Our Mobile Planet (2013), a Google-based website that provides data for industry research, shows the following percentage of users among 18-to-50 year olds: roughly 75% in Norway, the UK, the UAE and Australia; approximately 58% in France, Spain and the USA; around 45% in China and Denmark; with lagging countries represented by, surprisingly, Japan at only 30%, Mexico at 27%, and Brazil at 20%. One issue, however, is that while mobile devices are becoming more common, MALL is still in an emerging phase; studies to date have been mostly small-scale and of short duration under controlled conditions with a general lack of cumulative research (Viberg & Grönlund, 2012). However, in spite of many unanswered questions about how the mobile platform affects the way learners complete activities and make decisions (Stockwell, 2010), it is clear that in at least one area, mobile apps, developers and educators are already moving ahead, as shown by the growing number of language learning apps now available for the iOS and Android platforms. For example, in the android-based *Google Play* app store, the search terms "English Study," "ESL" and "language learning" yield at least a 1000 results; "EFL" shows 458; "IELTS," 400; "English grammar study," 389; and "TOEIC," 137 results.

This paper's authors are also involved in developing several language learning apps for the Android platform. Their most popular one, a free English grammar quiz game, has received over 500,000 downloads to date. This large user base indicates a significant interest in self-study among learners and provides an excellent opportunity to conduct quantitative research to analyze learner demographics, habits and preferences away from artificial academic environments and in more naturalistic settings (Stockwell, 2010). In the latter ecosystem, where the users have sought out the tool under their own initiative, a researcher might be able to get a more accurate picture of the learners' attitudes, motives and how they interact with the technology. With this goal in mind, this paper's authors have embedded survey questions within the above mentioned app to gather data on the users' age, gender, native language, and self-rated proficiency level. While this initial survey is somewhat limited in scope, the methodology used could provide a starting point for other developers and researchers to begin to identify the habits, preferences and learning styles of these early adopters.

Literature review

To date the majority of MALL research has been conducted in academic settings as opposed to more authentic environments, although some researchers (Chen, Li, & Chen , 2007; Ogata, 2008) did an admirable job of setting up computer supported ubiquitous learning environments that dynamically supported the learner outside of the class, using PDAs and sensors, badges and RFID tags embedded in different locations. Ogata (2008) describes a project called LOCH (Language-learning Outside the Classroom with Handhelds), where Japanese-language students were sent out into the community with PDAs to perform authentic tasks, such as interviewing a community member or asking for directions. By networking the PDAs and the various tags and sensors to a central computer, instructors were able to track the students' locations as well as send text messages in real-time to support their learning. The downside of these sorts of systems was that they required an IT expert and costly resources to set up.

Like PDAs, earlier cell phones, with their limited screen size and cumbersome text inputting, also lacked apps and GPS tracking, which made it extremely difficult for the "non-IT"

expert to set up task-based, context-aware experiential learning activities that could be "pushed" to students' mobile devices via apps and subsequently monitored and analyzed. Nevertheless, Chinnery (2006) noted the potential benefits of MALL, with the portability and low cost of devices compared to standard equipment. And working with the technology they had at the time, Kiernan and Aizawa (2004) explored the feasibility of using cell phones for task-based learning; Thornton and Houser (2005) pushed vocabulary lessons by e-mail to students phones as well as had students use them to evaluate web-based videos; Stockwell (2007) analyzed whether learners preferred to do vocabulary activities through either their mobile phone or a computer, while Chen, Hsieh, and Kinshuk (2008) addressed content adaptation in mobile language learning, specifically in regards to vocabulary recall.

While these sorts of studies have been an important first step for trying to understand both the potential of MALL as well as students' perceptions and attitudes, the limitation has been not only the artificial environments of the research (Stockwell, 2010), but that many studies have simply tried to transfer traditional classroom content onto the mobile platform (Chen, 2013) rather than trying to re-imagine a new MALL paradigm. In addition, Burston (2011) lists obstacles such as students quickly becoming intolerant of resources "pushed" to their devices by teachers, the extra costs incurred by students for text messaging connected to pedagogical applications, as well as the reliance on behaviorist principles and text-only interactions. Wang and Higgins (2006) mention the difficulty of following up on the learning achievements of students using mobile devices, and the lack of connectivity making tracking data difficult. Again, much of this can be attributed to the limitations of the technology at the time.

However, with powerful, multi-featured smart-phones and tablets now becoming more widespread, mobile phone technology has now reached a point where, according to Burston (2011), "guided by sound pedagogy, it can realize the promise of ultra-portable language learning" (p. 68). Modern smart-phones and tablets can personalize the learning experience through tracking of user profile and environmental parameters (Petersen, Markiewicz, & Bjørnebekk, 2009). GPS features and apps that seamlessly interact with LMSs can make it easier for educators with limited IT backgrounds to track learning in real time, both in the classroom and in more personalized environments. Text, audio, graphic, video and built in social networking capabilities allow for the easy creation of rich language learning experiences, both in and outside of the classroom. Finally, there are the thousands of free, inexpensive language learning apps mentioned above that can be exploited by both learners and educators.

While advances in hardware usually get the most attention, Godwin-Jones (2011) mentions the equally important software and the new opportunities that arise from mobile application development. He states: "As personal devices, smart-phones are ideal for individualized informal learning. The user determines which apps to acquire and how to use them" (p. 8). As educators it would behoove us to pay attention to the way our students are using apps for language learning and the implications for making learners more autonomous. Barrs (2011) suggests teachers get involved and recommend useful language learning apps to students and proposes that "such promotion could be done through an 'app of the week' style segment of a lesson or in class/institution newsletters" (p. 232). Steel (2012) echoes this, discussing the abundance of free and relatively inexpensive mobile apps: "Further, teachers need to be more aware of the language apps their students are using and how they are using them so they can provide some guidance and recommendations on how their learning benefits could be extended" (p. 879).

Recently there have been some studies focusing on how mobile apps are used and perceived by learners. Kim, Ilon, and Altmann (2013) interviewed forty graduate students in engineering and education about how they use smart-phone apps for learning and which apps they considered useful, and found that students had many apps on their devices that they regarded as "useful," although it seems the students' definition of "apps for learning" was quite broad as they included subway map and YouTube apps in this category, which according to the authors, could signify that the definition of learning among students is in transition. The study also mentioned that compared to the education students, engineering students used about half as many apps, and tended to use them more for getting information, whereas the former group used apps more for organizing information. In another study, Steel (2012) looked at students' own use of mobile apps and their perspectives on how these apps could benefit their language learning. She found that 56% of students reported using mobile apps to support their university learning, and 23% ranked mobile applications in their top three technologies. Students reported they liked apps because they allowed them to practice language anywhere and anytime, were flexible and convenient, and overall found mobile apps "easy to understand." Popular apps included mobile versions of language dictionaries, translators as well as mobile flashcards and games for vocabulary acquisition.

Some studies have also commented on app development and design. Kukulska-Hulme et al. (2011) examined how mature students use mobile devices in life and learning, and mentions that several universities now offer their students apps, which opens up the possibility for educators with programming experience or support to develop their own apps. Kukulska-Hulme et al. (2011) go on to advise that "it is important that educators planning to develop apps understand how students perceive and use their mobile devices...institutions planning to offer mobile apps should build on the existing preferences of students for social communication, listening to audio, watching videos and reading short texts if the apps are successfully to enhance the learning experience" (p. 17) In a study looking at m-learning among tertiary students, Watanabe (2012) concludes that MALL tasks need to be designed unique to smartphones and speculates that the learning of the future could be in the form of downloadable apps customized for the device screen size.

While not specifically referring to mobile apps, but no doubt applicable to their development, Burston (2011), drawing from past experience, suggests the following criteria when thinking about using MALL technology as a platform for language learning: its use cannot be intrusive; its cost must be minimal; its practical technological constraints must be reduced to a minimum; its learning programs must be based on pedagogical methodologies grounded in second language acquisition research.

This is a good start, and it provides a solid foundation for much needed future research. While technology in general has tremendous potential to provide access to resources for learning, as well as opportunities for autonomous learning (Reinders & White, 2011), mobile devices in particular are "challenging existing perceptions of appropriate time and place for study" (Kukulska-Hulme, 2012, p. 1). Taking note of the thousands of language learning apps that are now available as well as the other inherent features of mobile devices, such as video, texting, and audio, learners can increasingly play an active and independent role in their learning, "although how this should now be organized by and for learners, given the growth of new tools, services, and resources, remains a barely answered question" (Kukulska-Hulme, 2012, p. 2).

One initial approach is presented in this paper: use embedded surveys in language learning apps to better understand user demographics, and at the same time, create a

methodological foundation that future researchers could build on to explore learner practices, habits and preferences in non-classroom environments. As Kukulska-Hulme et al. (2011) write, "We believe the insights gained from looking at learners' accounts of authentic experience are essential…learners constitute a pool of valuable experience and expertise in the use of mobile technologies" (p. 18).

Methods

Research questions

The authors essentially wanted to better understand the age, gender, first language and user level profile of a typical English-as-a-foreign-language mobile self-study student. There is presently very little concrete research in this area due to the difficulty of gathering real-world data from popular mobile learning apps. However, the paper's authors, being app developers themselves, chose to embed a user profile survey in their most popular app, a free quiz-style grammar game with over 500,000 downloads. Based on the Common European Framework of Reference for Language (CEFR), the app has six graded levels from beginner to advanced and allows the user to self-select their level.

Participants

The quantitative research involved 3,739 international respondents who use the Android-based English grammar app mentioned above. The respondents volunteered over a three-month period from an active pool of over 100,000 app users. A total of 2,214 of the respondents came from the eight L1 languages surveyed in this study: French, German, Italian, Japanese, Korean, Russian, Spanish and Thai. A further 1,525 respondents were placed in an *Other* languages group.

Research design

The primary tool of this research was a Google Docs embedded questionnaire survey placed within a free English grammar Android app. Over a period of three months, 3,739 users responded to the survey. As an initial study, the authors were mainly interested in general demographic information: age, gender, self-assessed English language level and L1 (first language) – specifically, French, German, Italian, Japanese, Korean, Russian, Spanish and Thai. These were chosen because they represent the eight major operating languages used on mobile devices, after English, according to Google Play developer statistics for this app. Data from other L1s were not individually used in this study.

In discussing methodology, it is also important to highlight potential ethical issues that can arise when conducting mobile research. The authors relied on Frankel and Siang's (1999) ethical and legal framework for protecting human subjects participating in Internet-related research, which is based on the principles of autonomy, beneficence, and justice. To illustrate:

Autonomy. The research respondents participated of their own freewill. The survey was placed within an Android English grammar app, below the primary game area and to the

right of a large advertisement. The survey did not interfere with the game, and there was no requirement for users to respond, nor were they enticed in any way.

Beneficence. The app was free and provided an entertaining, engaging way for users to practice and test grammar skills at an appropriate level. In addition, respondents could indirectly benefit if the use of their data leads to the development of better language apps.

Justice. The authors regarded Frankel & Siang's (1999) "protecting human subjects" as synonymous with "protecting personal privacy." No attempt was made to collect information that could compromise the respondents' identities, including the gathering of users' email addresses, telephone numbers or device IDs.

It may be useful at this stage to point out that anonymity and security issues in e-research can be a serious, problematic issue. One must take care, for example, to prevent respondents' data from being intercepted by malicious parties over unsecured networks. Ideally, an SSL certificate that provides secure (HTTPS) communication should be installed and hosted by the researcher, but one can take advantage of third-party services that offer HTTPS, such as Google Docs survey. The main drawback of this latter method is that a third party has access to respondent data. However, this research focused on only general demographic information, so the authors felt the security features combined with the convenience of Google Docs outweighed any privacy issues, especially since the data collection method was disclosed to respondents beforehand on the survey.

In addition to privacy, it is important to acknowledge other issues involving data collection and how they could have affected the results of this research. First, to avoid multiple survey submissions by the same user, the authors discarded all identical secondary responses within a two-minute time period. However, this time frame is quite short, so it is possible the same user's data could have been included in the pool again if the survey was taken at a later date, although these numbers are probably minimal. A second issue, unrelated to technology, was that the survey was in English. Although the language was kept as simple as possible, in hindsight it would have been better to have used the respondent's L1.

Results

According to the Google Play developer statistics, at the time of the study, the English grammar app had 123,819 active users. An active user is defined as a user who has the app on their device and consequently could have responded to the survey during the research period. Among the eight selected languages, active users broke down as follows: Spanish 9,695 (7.83%), French 8,966 (7.24%), Japanese 7,317 (5.91%), Thai 7,245 (5.85%), Russian 6,761 (5.46%), Italian 5,679 (4.59%), Korean 5,232 (4.26%), and German 4,446 (3.59%).

However, the response rates among active users of the app varied quite widely: French 7.38%, Spanish 6.04%, German 4.75%, Italian 3.86%, Russian 3.19%, Korean 2.75%, Japanese 1.37%, and Thai 1.05%. This led to the 2,214 L1 respondents from the eight selected languages breaking down as French 29.9%, Spanish 26.5%, Italian 9.9%, Russian 9.8%, German 9.5%, Korean 6.5%, Japanese 4.5% and Thai 3.4%.
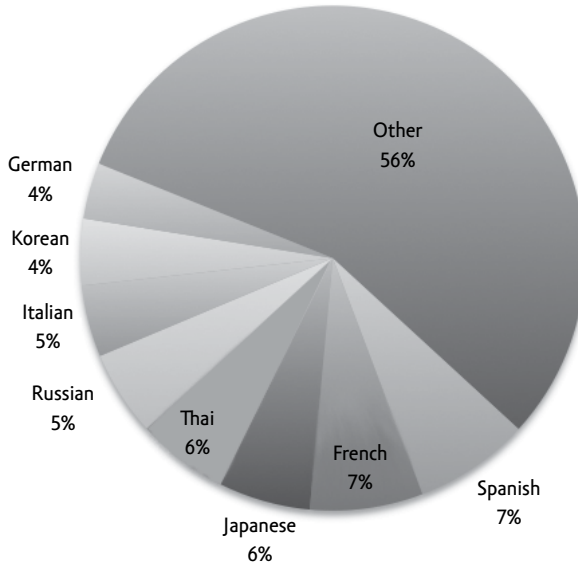
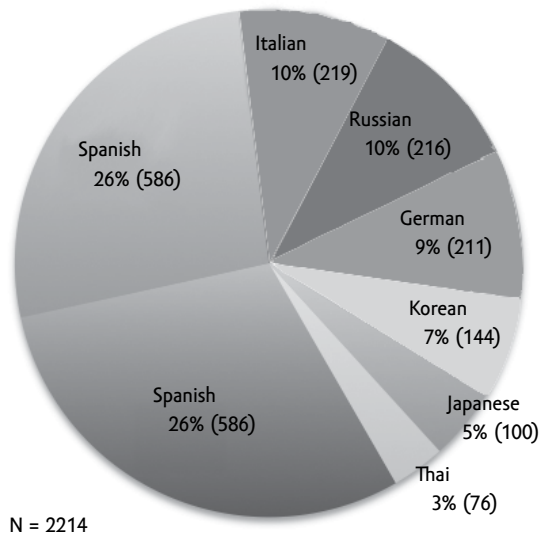Figure 1. L1 % breakdown of active users

N = 2214

Figure 2. Percentage breakdown of respondents' L1

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Table 1: Respondents' age and gender

Age	Respondents		
	Total	Male (%)	Female (%)
0–14	13.19%	34	66
15–24	36.64%	54	46
25–34	28.54%	61	39
35–44	13.83%	64	36
45–54	5.51%	68	32
55–64	1.77%	59	41
65+	0.53%	65	35
Total	100%	56	44

As Table 1 shows, users were much more likely to respond to the survey if they were between the ages of 15 and 34, with respondents under 25 years old comprising nearly half (49.8%) of the responses.

Looking at gender, 56% of the total respondents are male. In fact, over the age of 14, males outnumber female respondents in every age category. Interestingly, the sole exception is the youngest age group, where two thirds of respondents are female.

Breaking down this data further, Table 2 below illustrates the correlation between respondent L1 and gender. For instance, in all the over-34-years-of-age categories, males

Table 2: Dominant gender by age and L1

Age	French		German		Italian		Japanese		Korean	
0–14	138	M26/F74	57	M28/F72	32	M34/F66	8	M75/F25	16	M44/F56
15–24	261	M52/F48	89	M31/F69	52	M35/F65	36	M50/F50	45	M60/F40
25–34	143	M66/F34	21	M52/F48	64	M41/F59	27	M67/F33	45	M51/F49
35–44	67	M63/F37	20	M65/F35	36	M58/F42	21	M71/F29	24	M58/F42
45–54	31	M61/F39	18	M72/F28	22	M77/F23	8	M88/F13	13	M54/F46
55–64	14	M57/F43	4	M50/F50	10	M60/F40	0	M0/F0	1	M100/F0
65+	8	M50/F50	2	M100/F0	3	M100/F0	0	M0/F0	0	M0/F0
Total	662	M51/F49	211	M40/F60	219	M47/F53	100	M64/F36	144	M55/F45

Age	Russian		Spanish		Thai		Other	
0–14	32	M22/F78	66	M32/F68	12	M50/F50	132	M43/F57
15–24	102	M39/F61	173	M42/F58	23	M30/F70	589	M67/F33
25–34	54	M43/F57	178	M49/F51	25	M40/F60	510	M71/F29
35–44	18	M61/F39	112	M58/F42	13	M31/F69	206	M70/F30
45–54	7	M57/F43	45	M67/F33	3	M67/F33	59	M69/F31
55–64	3	M67/F33	10	M40/F60	0	M0/F0	24	M67/F33
65+	0	M0/F0	2	M100/F0	0	M0/F0	5	M40/F60
Total	216	M40/F60	586	M48/F52	76	M38/F62	1525	M66/F34

F = Female, M = Male, M%/F%, N = 3,739

dominate (mean average of 64%), whereas in the youngest grouping (0–14), females dominate (66%), with the exception of the Japanese and Thai L1s. The 15-to-24-year-old age bracket also leans slightly towards female (51.4%), with five of the nine L1 groupings having female majorities, two relatively balanced, and two male dominated.

Curiously, among the eight language groups targeted, it is evident that there are far more male respondents amongst the Japanese speakers (64%) and the *Other* category, where about two thirds of respondents are male. In contrast, females are in the majority among German (60%), Russian (60%) and Thai (62%) speakers. For other L1s, the Korean speakers are slightly weighted towards the males (55%), whereas the French (M51/F49), Italian (M47/F53) and Spanish (M48/F52) speakers are more balanced. Table 2 also makes clear that while the percentage of male users is higher overall in the older age groups, it is by no means universal. For example, females have a majority in two L1 groupings (Spanish 55–64 and Thai 35–44), and a further two are balanced (French 65+ and German 55–64).

Next, the relationship between gender and L1 and language study level was examined, as detailed in Table 3 below. By factoring in the self-assessed level of the respondents against L1 and gender, a relatively similar pattern among each L1 group of respondents emerges, with males and females reporting similar ability levels. Indeed, nearly all language groups' respondent learner levels differ based on gender by less than 10%, with the exception of German, Korean and Russian speakers.

Table 3: L1 Gender differences

	German		Korean		Russian	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
Beginner	61	72	67	50.7	44.8	59.7
Elementary	23.5	11	13.9	12.3	19.5	18.6
Pre-Intermediate	3.5	4.7	8.8	7.8	16.1	7.8
Intermediate	7	5.5	3.8	20	12.6	7

For example, Table 3 shows that 72% of German-speaking females respondents considered themselves at beginner level, while only 61% of males did. However, 23.5% of German-speaking male respondents self-assessed at the elementary level in comparison to 11% of females. Furthermore, 67% of Korean L1 male respondents considered themselves beginner level, while only 50% of Korean females did. Also, 20% of Korean L1 female respondents considered themselves intermediate as opposed to about 4% of males. Lastly, amongst Russian-speaking respondents, about 45% of males rated themselves beginner in contrast to about 60% of females. Further research to understand the gender imbalance within the German-, Korean- and Russian- speaking populations across self-assessed learning levels could yield interesting results.
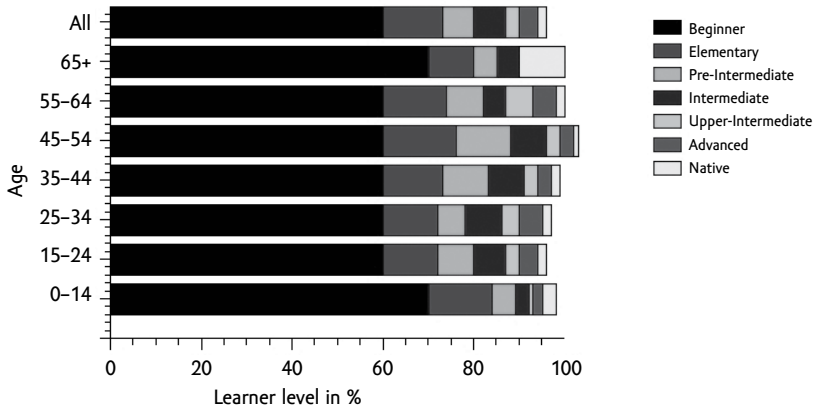
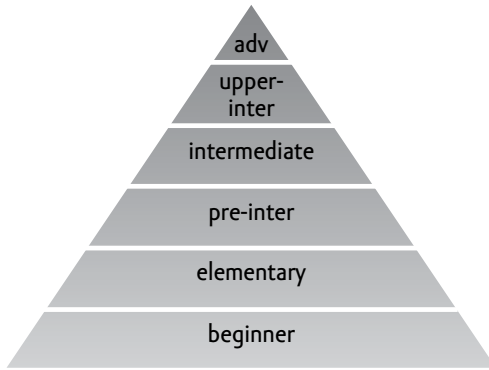Figure 3. The Percentage of Learner Levels in Each Age Grouping
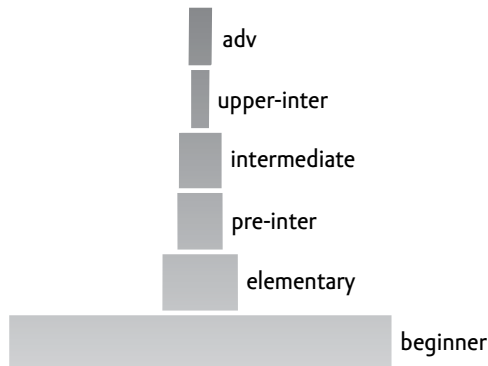

Figure 4. Classic learner pyramid.

Figure 5. Respondents' actual learner pyramid.

In order to survey the respondents' language levels, six categories that align with the Common European Framework of Reference for Languages (CEFR) were used: beginner, elementary, pre-intermediate, intermediate, upper-intermediate and advanced. The app also is comprised of the same six levels; therefore, the user could draw on their app experience to answer the survey question. Interestingly, the self-assessed ability levels of all ages, even allowing for gender, are not distributed as similarly as what one would expect from a typical population of language learners: a large beginner-base, a narrower middle block of intermediate respondents, and finally, a small elite of advanced users, tapering upwards to form a pyramid shape (see Figure 4). Instead, this paper's data shows a respondent-level pyramid that is heavily skewed towards the beginner level, and also seems to indicate that there are more advanced-level users of the app than upper-intermediate ones (see Figure 5).

Table 4: Age by L1

Age	French	German	Italian	Japanese	Korean	Russian	Spanish	Thai	Other
0–14	20.85%	27.01%	14.61%	8.00%	11.11%	14.81%	11.26%	15.79%	8.66%
15–24	39.43%	42.18%	23.74%	36.00%	31.25%	47.22%	29.52%	30.26%	38.62%
25–34	21.60%	9.95%	29.22%	27.00%	31.25%	25.00%	30.38%	32.89%	33.44%
35–44	10.12%	9.48%	16.44%	21.00%	16.67%	8.33%	19.11%	17.11%	13.51%
45–54	4.68%	8.53%	10.05%	8.00%	9.03%	3.24%	7.68%	3.95%	3.87%
55–64	2.11%	1.90%	4.57%	0.00%	0.69%	1.39%	1.71%	0.00%	1.57%
65+	1.21%	0.95%	1.37%	0.00%	0.00%	0.00%	0.34%	0.00%	0.33%

The respondents' ages vary somewhat considering their L1s. For example, around 87% of Russians, and close to 80% of French, German and Thai speakers are under 35 years old. This compares to about 70% of Italian, Japanese, Korean and Spanish L1s. In addition, among the eight L1s, the Japanese group under 15 years of age has a particularly low respondent rate of 8%. This contrasts to a high of 27% for the German L1 group, and a roughly 14.7% mean average amongst all the L1s.

Table 5: Female respondent age by L1

Age	French	German	Italian	Japanese	Korean	Russian	Spanish	Thai	Other
0–14	31.58%	32.54%	17.95%	5.56%	13.85%	19.38%	14.80%	12.77%	14.62%
15–24	38.70%	48.41%	29.06%	50.00%	27.69%	48.06%	32.89%	34.04%	38.40%
25–34	15.17%	7.94%	32.48%	25.00%	33.85%	24.03%	29.93%	31.91%	29.24%
35–44	7.74%	5.56%	12.82%	16.67%	15.38%	5.43%	15.46%	19.15%	12.09%
45–54	3.72%	3.97%	4.27%	2.78%	9.23%	2.33%	4.93%	2.13%	3.51%
55–64	1.86%	1.59%	3.42%	0.00%	0.00%	0.78%	1.97%	0.00%	1.56%
65+	1.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.58%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

If we include gender in our analysis, we see that around a third of French and German L1 female respondents are under 15 years old. In fact about 80% of German L1 and 70% of French L1 females are under 25 years of age. An interesting aspect of the data is the very low number of female respondents over 34 years old. In fact, with the exception of Italian **13**

users (3.42%), no language group has more than 2% of its female respondents over 54 years old. Indeed the proportion of females over 44 years old was also very low: Korean 9.23%, Italian 7.69%, Spanish 6.9%, French 6.76%, and German 5.56%.

Discussion

While this paper's data is somewhat limited in scope, it does allow for some interesting observations and assumptions about MALL user demographics as well as put forth more questions for future research.

Overall, the present survey data shows that a typical user of the authors' English grammar app is very likely to be under 35 years of age, slightly more likely to be male than female, and almost certainly will be a beginner, or at least a lower-level learner of English.

The most compelling statistic in the study was that roughly 64% of respondents considered themselves beginners, and only 12% self-assessed as elementary. While one might reasonably assume that the beginner level would be the largest, the difference between the two is surprising. Within the beginner-level category, two age and gender groups stood out: teenage-to-early-20s females, and older, 30-to-40-year-old males. This would seem to indicate that app developers and educators might want to target the very lowest level, especially if development costs are an issue, and possibly create separate apps that appeal to adolescent females' and older males' interests.

Of course, technology and user preferences can change quickly, so it is hard to know if this trend will continue in the future. However, by examining the limited data taken from respondent surveys, it might be worthwhile to speculate about certain demographic groups:

Children. French and German L1 groupings seem to have a large number of children using mobile apps. This may suggest that the other L1s will eventually catch up, or it may point to a cultural difference in mobile app usage. Also, the large base of younger female users (66% versus 34%) at the beginner level could mean that there will be continued demand for apps that target young females and, as they mature, older ones.

Surprisingly, the younger male group is only half the size of their female counterparts. One reason could be that there are more competing devices, such as the X-Box, Nintendo Wii or Sony PlayStation, although girls play these, too. Alternatively, young males may be less inclined to take a survey.

Over 34 years old. Across both genders, the 35-years-and-older age brackets are likely to experience large growth in the years ahead. The 25-to-34-year olds account for 1,067 respondents compared to a total of 809 respondents for the entire 35- years- and -older age groupings. Given this, it seems conceivable that the over 34-year -old age groups are set to more than double in the next ten years, as the younger users simply become older. Thus, in real terms, we shall most probably see a maturing of the EFL/ESL app user demographic.

Older females. Compared to their male counterparts, this group was conspicuously small. There were only 288 female respondents over 34 years of age compared to 521 male peers. Reasons could include social and economic factors, but possibly the gender preferences of this age group played a part, especially when comparing the 288 older females with the 1,372 females under 35 years of age who responded. However, since 415 (39%) of the 25-to-34-year-old respondents were female, it seems likely that the over 34 years of age female

groupings will see very large gains in the coming decade as these female 20-somethings become 30-somethings.

A final area worthy of discussion is how L1 correlated with both the survey response rate and perception of skill level. For example, among the eight nationalities included in the study, the response rates were as follows: French 7.38%, Spanish 6.04%, and German 4.75%. This contrasted fairly starkly to the poor return among the Asian L1s: Korean 2.75%, Japanese 1.37%, and Thai 1.05%. While this could be attributed to a generally higher proficiency level among Europeans, cultural factors might also be at play, just as they seemed to be with respondent skill-level rating. For instance, a significantly greater number of Korean L1 men than women consider themselves beginner (M67/F50.7), yet the opposite is true for Russian speakers (M44.8/F59.7). This shows that the L1 culture likely had an effect on the findings.

Questions for further research:

- What are learner usage patterns?
- What are learner preferences when it comes to apps?
- How helpful do learners think apps and other mobile technology are for learning languages?
- What are the characteristics of a good language app?
- Which language apps are rated the highest, and why?
- Are upper-level users more likely to use particular kinds of apps for self-study, such as ones focused on a different skill or content area?
- Why was there such a drop off in respondents from the beginner to elementary level in the survey?
- Why are so many more girls using the app than boys?
- How much does the fact that we used an image of a girl in the design influence the gender results?
- Is there more of a willingness among girls to fill out surveys, which masked the true number of young male users?
- Do older women use mobile devices less than older men for language learning?
- What other data can be gathered by app surveys that would show cultural differences between L1 groups?

Conclusion

The potential for mobile learning is now being realized as smartphones and tablets continue to proliferate and learners, trainers and educators further integrate these technologies into their everyday lives. While the emergence of MALL is giving learners more choices about what, when, where, and how they learn, this freeing from the traditional strictures of the classroom presents new challenges for educators and researchers wanting to assess autonomous learning outside of traditional educational settings. One approach, as outlined in this paper, is to use the apps themselves to better understand user demographics. While this initial study is somewhat limited in scope, the authors hope it will provide both a framework and starting point for future researchers to explore this exciting new area of language education. Provided the user's privacy is respected, embedded surveys and download statistics can provide a means to explore who learners are and how they interact with technology in non-classroom settings, which can lead to the creation of apps that better meet the needs of learners.

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Appendix

The raw data collected from 3,739 respondents.

Male age by L1

Age	French	German	Italian	Japanese	Korean	Russian	Spanish	Thai	Other
0-14	36	16	11	6	7	7	21	6	57
15-24	136	28	18	18	27	40	73	7	392
25-34	94	11	26	18	23	23	87	10	360
35-44	42	13	21	15	14	11	65	4	144
45-54	19	13	17	7	7	4	30	2	41
55-64	8	2	6	0	1	2	4	0	16
65+	4	2	3	0	0	0	2	0	2
Total	339	85	102	64	79	87	282	29	1012

Female age by L1

Age	French	German	Italian	Japanese	Korean	Russian	Spanish	Thai	Other
0–14	102	41	21	2	9	25	45	6	75
15–24	125	61	34	18	18	62	100	16	197
25–34	49	10	38	9	22	31	91	15	150
35–44	25	7	15	6	10	7	47	9	62
45–54	12	5	5	1	6	3	15	1	18
55–64	6	2	4	0	0	1	6	0	8
65+	4	0	0	0	0	0	0	0	3
Total	323	126	117	36	65	129	304	47	513

Age by L1

Age	French	German	Italian	Japanese	Korean	Russian	Spanish	Thai	Other
0–14	138	57	32	8	16	32	66	12	132
15–24	261	89	52	36	45	102	173	23	589
25–34	143	21	64	27	45	54	178	25	510
35–44	67	20	36	21	24	18	112	13	206
45–54	31	18	22	8	13	7	45	3	59
55–64	14	4	10	0	1	3	10	0	24
65+	8	2	3	0	0	0	2	0	5
Total	662	211	219	100	144	216	586	76	1525

Male age by level

Age	Beginner	Elementary	Pre–Int	Intermediate	Upper–Int	Advanced	Native	Total
0–14	130	16	6	6	1	0	8	167
15–24	452	89	55	53	21	46	23	739
25–34	409	81	33	53	30	35	11	652
35–44	198	43	31	31	9	10	7	329
45–54	82	18	17	13	5	5	0	140
55–64	22	6	2	2	4	2	1	39
65+	10	0	0	1	0	0	2	13
Total	1303	253	144	159	70	98	52	2079

Female age by level

Age	Beginner	Elementary	Pre–Int	Intermediate	Upper–Int	Advanced	Native	Total
0–14	223	55	21	10	4	8	5	326
15–24	421	70	48	45	23	12	12	631
25–34	264	41	34	34	15	17	10	415
35–44	116	26	20	10	7	7	2	188
45–54	36	15	8	4	0	2	1	66
55–64	18	4	3	1	0	1	0	27
65+	4	2	1	0	0	0	0	7
Total	1082	213	135	104	49	47	30	1660

Age by level

Age	Beginner	Elementary	Pre–Int	Intermediate	Upper–Int	Advanced	Native	Total
0–14	353	71	27	16	5	8	13	493
15–24	873	159	103	98	44	58	35	1370
25–34	673	122	67	87	45	52	21	1067
35–44	314	69	51	41	16	17	9	517
45–54	118	33	25	17	5	7	1	206
55–64	40	10	5	3	4	3	1	66
65+	14	2	1	1	0	0	2	20
Total	2385	466	279	263	119	145	82	3739