

30 Future Directions in Informal Language Learning

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Introduction

The chapters of this book provide ample evidence of the rich variety of possibilities today for informal language learning. In this chapter, the focus is on which of those opportunities seem likely to be of continuing importance. We will also look at what the future might bring for language learners both in and out of the classroom. No one can predict accurately coming developments, particularly in the fast-moving domain of digital technology – all the more so considering the immense differences which exist worldwide in socioeconomic conditions, educational opportunities, technology infrastructure, and national/local language dynamics. However, we can extrapolate from current trends and look at emerging tools and services.

Understanding experiential language learning: A growing need

Untutored second language acquisition is not something exotic, it is the normal case, and if we want to understand the very principles according to which the human mind constructs, copies, and uses linguistic systems, then we must study how human beings cope with this task when not under the influence of teaching. (Klein and Dimroth 2009, p. 519)

Relatively little is known about language learning independent of formal education, despite the fact that “the majority of the world’s language learners acquire second and additional languages in naturalistic contexts” (Polat and Kim 2014, p. 184). There are studies of informal L2 (second language) learning through “quotidian interactions” (see Lightbown and Spada 2006), but they are few in number. With some exceptions, such as Polat and Kim (2014), Barraja-Rohan (2015), and Chik and Ho (2017), studies do not follow learners through different stages of life. Informal language learning “in the wild” (Hutchins 1995) through everyday living situations is difficult to analyze because it is difficult to document. It is certainly possible to have a learner record language encounters for later analysis. Eskildsen and Theodórsdóttir (2017) show how applying conversational analysis to service encounters or other daily activities can be highly informative in understanding language development in the wild. Given the large number of displaced individuals today, propelled by difficult or dangerous conditions in their home countries to relocate and learn a new language, there is

a great practical need to collect and analyze data on the different ways migrants and refugees develop language.

The data collected will be crucial in informing developers of language-learning applications designed to be used in out-of-school settings and particularly on mobile devices. In working to develop mobile apps for refugees to Germany, Sykes (2018b) has shown that there are a variety of ways newcomers are going about learning German. These involve most prominently informal learning, through short lessons in their native languages via WhatsApp, Facebook, or YouTube. While these were found to be the most used avenues for language learning, there were also other casual interactions such as those with family members and peers, which involved exchanging information about coping in German. For those in refugee camps, contact with camp volunteers offers possible L2 encounters, as well as, in some cases, organized camp classes. Looking at all the environmental factors in such situations is important, as a “greater understanding of naturalistic acquisition processes can help instructors to better assist learners from refugee and immigrant backgrounds, who may need completely different kinds of instruction and attention than ‘traditional’ classroom learners” (Polat and Kim 2014, p. 205). This kind of targeted community-based language learning will look quite different from traditional language-learning environments. Sykes (2018b) points out that for refugees in Germany the greatest need is not for development of accuracy or fluency, but for pragmatic and strategic competence (formulating requests, asking for help) and the embedding of learning within existing communities. Beyond communicative abilities, newcomers need help in integrating into the new environment by learning how to cope with cultural practices and practical day-to-day living. Language development in such contexts needs to be tied closely to real-world conditions. Mobile apps developed by German governmental agencies and non-governmental organizations have targeted areas such as dealing with German bureaucracy (how to fill out official forms) and providing practical tips on day-to-day life, such as how to shop for food in Germany (see Godwin-Jones 2017b).

The situation for refugees in Germany is further complicated by the fact that the local language they may encounter on the street may not be standard German but rather a dialect. Another complicating factor is the increasing role that English plays in many spheres of German society today, as is the case in many parts of the world. In fact, depending on the native language of refugees, it may be difficult for newcomers to Germany, or other European countries, to navigate mobile apps or government websites without a knowledge of English. In many European countries, newcomers trying out their developing language skills may be addressed in English by natives (see Wagner 2015). Globalization and mass migrations have in fact led to a greater mix of language than ever before, especially in urban aggregations. The multilingual environments evident in many cities has resulted in the possibility of learning a language “by walking down the street” (Chern and Dooley 2014). At a minimum, the rich linguistic landscapes of urban centers supply multilingual language awareness. Chern and Dooley (2014) show that for English learners in Taipei, capturing instances of English usage on signs, billboards, advertisements, or overheard scraps of conversation can provide materials for reflecting on the social messaging inherent in language choice. This can help lead beyond conventional literacy skills to “sophisticated pragmatic and critical reading capabilities” (Chern and Dooley 2014, p. 114).

In looking at language use today, this multilingual reality (and the special role of English) needs to be recognized, both as it exists in-person and online, and to be considered in language-learning contexts (see Lin et al. 2018). The traditional binary opposition of L1 and L2 in most cases has lost its validity. The term *linguistic superdiversity* has been coined to describe this phenomenon (Blommaert and Rampton 2012). Blommaert (2012) associates superdiversity with three characteristics: mobility, complexity, and unpredictability. A number of studies have shown how translingual practices manifest those characteristics. These include studies of the remixing of Japanese manga in Sweden (Jonsson and Muhonen 2014) or the

linguistic complexity of Dutch-Chinese young people (Li and Juffermans 2011). A particularly striking case is that of a rap artist in rural China who uses a combination of local dialect, Mandarin, and English, while posting his songs on the internet (Wang 2012). The complexity and variability of language use and language development in informal environments has led to calls to apply complexity theory or similar approaches to the phenomenon (Cole and Vanderplank 2016; Godwin-Jones 2018a).

Mobile devices are powerful enablers of chronicling experiential language learning. If done within formal language instruction, this can provide real-world contexts for language and culture learning. Students can record local conversations in-person, or take notes on conversational exchanges online. If the learner is enrolled in formal instruction, this documentation can provide valuable learning opportunities: “The harvested documentaries are shared and potential problems and issues of understanding are brought up. Interestingly, even simple everyday tasks such as ordering a coffee often do not run by the book but students have to solve local contingencies that they are not prepared for” (Wagner 2015, p. 92). The potential for integrating cultural and language learning through place-based language interactions, linked to smartphone use, can be seen in mobile games such as *Mentira*. This app uses augmented reality to integrate language and culture in the game environment to people and locations in a particular neighborhood where the target language (Spanish) predominates (Holden and Sykes 2011). The scenarios created in such an app offer rich opportunities for pragmatic language awareness, as learners need to request information and assistance, as well as respond in culturally appropriate ways to simulated personal encounters.

Mobile phones are increasingly important as a means to combat digital inequality. Liao et al. (2016) points out that this term is preferable to the often cited “digital divide,” as digital devices are being increasingly integrated into the everyday lives of people around the globe. In particular, there’s often a gulf in internet access and digital literacy between urban and rural communities, which may be more significant than the divide between countries. As wired connections are often not available outside urban areas, mobile phones are being increasingly used for online access. The dramatic drop in the cost of smartphones, especially Android devices, along with the increasing capabilities of mid-range devices, is bringing digital resources and therefore online language learning to long-underserved populations. This is likely to continue to bring profound changes to both literacy education and language learning occurring outside formal channels (see Godwin-Jones 2017b). At the same time, concerns have been raised over the “second order digital divide,” referencing not just online access but unequal broadband speed and consistency of internet connectivity (Brotcorne et al. 2010).

Recreational language learning on the rise

Student 1: *Do you like to see Western films?*

Student 2: *Well, of course. But I’m afraid I’ll learn nothing from it because I enjoy watching too much. (cited in Benson 2017, p. 142)*

One of the phenomena that has been made possible by both the spread of mobile technology and the greater degree of online access to entertainment in the form of videos, TV series, and music is what Chik and Ho (2017) label “recreational language learning.” This involves online users accessing materials in an L2, not for the explicit purpose of learning, but to be entertained or to socialize. In the process, L2 learning may occur, of which the individual may not even be aware. The motivation for engaging in such activities online is personal, not academic or institutional, driven by the “wish to be entertained, to be able to

communicate with acquaintances, or to find relevant information for personal or school purposes" (Kusyik 2017, p. 92). The evidence that this kind of "incidental acquisition" of language (Sockett 2014, p. 8) can be effective and is of increasing popularity raises the likelihood of this trend continuing into the future. Sockett (2014) studied this phenomenon, examining the online informal learning of English in France. As have other studies, Sockett found that it was not because the material consumed was in English that motivated users to access it, but rather it was "the perceived cultural desirability of the contents" (p. 4). This principally involved pop music and film/TV shows. In both contexts, there tended to be multiple modes being accessed at once. For music, this involved concurrent listening and reading of lyrics online. Watching movies or TV programs often involved reading subtitles. Multimodal experiences – combining media in one interface or multitasking with multiple media – has become the common model for consumption (and production) online. In fact, we are seeing greater use of multimodal creativity (especially digital storytelling) both in school and out-of-school settings as a means to enhance language learning and also to motivate students, especially from underprivileged or migrant families, through validation of their cultural backgrounds (see Godwin-Jones 2018c). Digital storytelling, incorporating learner consultation with community representatives, such as elders, can provide a means to express pride in one's heritage, as well as to help sustain languages, as in the case of Alaska Yupik (see Little and Thorne 2017).

One of the recent developments in online videos that has enabled its more effective use in the service of language learning is the greater availability of original language soundtracks, particularly for English language movies and television. This has been made possible through video-sharing services such as YouTube, peer sharing, and internationally available video-streaming services like Netflix. It is also possible to view original national TV programming through station or network websites or, alternatively, through the use of VPN (virtual private network) services, which enable access to streaming services. These developments have broken down the traditional distinction between countries using dubbing, such as France, and those presenting video content on TV in the original language with subtitles, such as Denmark. The latter has been one of the phenomena seen as responsible for the more widespread proficiency in English in Nordic countries (Wagner 2015). Sockett's study (2014) found that the frequency of viewing of English language media correlated with English language development, particularly in the areas of vocabulary and idiomatic language. Exposure to lexical chunks (fixed or schematic multiword units) in context has been shown to build lexical sophistication, i.e. the ability to use formulaic constructions to produce more natural language (Godwin-Jones 2018a). Abrams (2016) showed that the viewing of target language TV series (in this case in German) can be effective even for beginners, particularly when paired with viewing supplementary online materials. Given both the availability and the high degree of user interest, this mode of recreational, incidental language learning is likely to persist and grow.

L2 learners' interest may lead them to engage in other kinds of recreational interactions online which can facilitate language development. One of these is through taking on the role of a fan – of a musician, actor, or writer, or of a popular genre such as detective stories, youth literature, Japanese anime, television series, or science fiction. Sockett (2014) describes the extensive English reading and writing in which one French fan of the Irish singer Moya Brennan engaged while participating regularly in an internet forum discussing her music. Sauro (2017) discusses a number of other fan-related activities, including writing fan fiction (extending stories, inventing new story lines or characters, inserting oneself into stories, etc.), fansubbing (subtitling of movies, TV shows, or anime), and scanlation (translation of image-based materials such as comic books or manga). Other studies, such as Lam (2000, 2006) and Black (2006) have shown how engaging online in fan-related

activities has led not only to language-learning opportunities, but also to a sense of personal growth, as well as, in some cases, to the development of technical skills such as webpage design. Participation and language choice in online fan communities can involve a complex set of motivations. Finnish fan fiction writers, for example, used English to reach a larger audience but also as identity and social statements, “as a way to interrogate and subvert social expectations and stereotypes of gender and sexuality in the media and in Finnish society” (Sauro 2017, p. 137). Sauro (2017) points out that a recent trend is the participation in organized online fan communities that may develop into forms of social activism or political involvement.

New opportunities for learning through games and social media

Today I went to a lot of dungeons with Sivanía and Picarico. Then we went to Elwynn Forest to teach Silvanía to collect plants for Herbalism and Inscription. That was fun. It seems that when I am with Picarico or with Silvanía I feel good, but this is because I feel comfortable if I need I ask them about Spanish. (Spanish learner’s journal entry about fellow guild members playing *World of Warcraft*, cited in Rama et al. 2012)

Another leisure time activity lending itself to potential L2 development is gaming. Digital games vary so widely in type and usage that generalizations about gaming and language learning do not offer much guidance. However, studies have indicated that, similar to the frequent viewing of videos, there can be an immersive element in online gaming that facilitates language learning. Gamers use language in real and meaningful ways to accomplish a task. Gameplay involves a variety of language use situations, as well as a good deal of repetition with variation. Players in multiplayer games typically receive feedback to which they respond. Recent studies have shown that language exposure in multilingual game environments can, in fact, further language development: “Meaningful communication with other speakers of the target language can support the transfer of what was observed in-game to actual language use” (Scholz 2017, p. 41).

For both fan culture and online gaming, the potential gains in language learning likely accrue from participation in related social media (forums, chatrooms, or dedicated websites). There seems little likelihood that we will see anytime soon an end to the widespread use of social networking through sites such as Facebook and Twitter, photo- and video-sharing services such as YouTube and Flickr, or other “affinity spaces,” such as blogs, wikis, or discussion forums (Gee 2005). As is the case for online gaming, participation is no guarantee of L2 learning or even to language exposure. However, as many studies have shown, the opportunity is there in social media to use an L2 in real communities of practice (Wenger 1998). Sockett (2014) has shown how the many synchronous and asynchronous functions in Facebook provide a variety of user interactions and language use situations, such as online chat, posting text/images, commenting on others’ posts.

The language socialization process involved in being an active participant in L2 or mixed languages social media sites has the potential to “expand identifiable semiotic resources” (Reinhardt and Thorne 2017, p.10). Language use in Facebook is mostly socially oriented and not transactional, and, in this way, is quite different from typical classroom interactions. Warner and Chen (2017) have shown the potential linguistic complexity and sophistication involved in participation in Facebook interactions, such as recognizing citations, detecting irony or sarcasm, or untangling code-switching.

Growing participation in nonformal, yet structured learning

It's a disaster ... "La Mappa Misteriosa Episodio Cinque" is not on YouTube! So I followed the suggested Italian lessons from other Duolingo users, "In Italia - L'Italia e L'italiano per stranieri" (Italian for foreigners). (Facebook post, cited in Chik and Ho 2017, p. 167)

While participation in social media and other affinity spaces will continue to be potential sites of L2 learning, there is growing interest in nonformal L2 learning through use of commercial online language-learning services such as Duolingo or Babbel. Given their widespread use internationally, such services are beginning to attract more scholarly attention (Lin et al. 2016; Munday 2016). The services are sometimes called language learning social networking sites (LLSNS), as they seek to build communities of learners. Typically, they offer both tutorial style training as well as opportunities to learn from native speakers or peers. It is difficult to draw any general conclusions on the efficacy of such services, as they vary greatly in content and available features. Liu et al. (2015) found in their study of using LLSNS for learning English that the services surveyed (in this case, italki, Lang-8, LingQ, and Polyglotclub) have the "potential to facilitate language learning" (p. 113) and that users valued in particular the social features of the sites and the feedback from peers. The usefulness of these services depends largely on the efforts and commitments of individual learners, as is the case with all digital learning tools and services. Some users in the Liu et al. study (2015) did not find the content appropriate or relevant for their learning goals. Other concerns raised about the use of LLSNS include their cost (most use a freemium model) and, as with all social media, the possible lack of privacy. Some studies have highlighted particular language gains through use of an LLSNS. Lin et al. (2016) in their study of LiveMocha reported that users perceived improvement in their listening and speaking skills through regular use of the service. Study results showed improvement in L2 writing, particularly in the area of syntactical structure. The study also found that user attrition is a common problem in using such services, as other studies have also shown (Nielson 2011).

A high drop-out rate tends to be an issue as well for a related, nonformal language-learning opportunity, language MOOCs (massive open online course) or LMOOCs (Barcena et al. 2015; Fuchs 2017). Reports on learning through LMOOCs vary greatly, as the nature of the content differs significantly, as do the features and purpose of the courses. LMOOCs normally provide a predetermined and fixed learning path, in contrast to the wider choice and personalization options available in an LLSNS. To be successful, LMOOCs rely on extensive interactions among learners (Chik and Ho 2017). Monitoring of user language and learning progress varies, but due to the typically large number of course enrollees, feedback is often provided by volunteer or paid native speakers or tutors (Godwin-Jones 2014).

One of the advantages of both LLSNSs and LMOOCs is that they provide a ready-made community of learners. For some learners, this is a more attractive alternative to seeking out language-learning opportunities independently. In their study of recreational language learning, Chik and Ho (2017) found the use of LLSNS to be of increasing popularity among the student population surveyed, as they offered a "stable learning environment" and "facilitated continuity of learning" (p. 167). Learners expressed frustration that in using YouTube videos or similar resources there were sometimes missing episodes or that they encountered other difficulties accessing desired materials. While such learners appreciated the fixed reliable structure of the LLSNSs, they did not use LMOOCs, despite their similar advantages, because they adhere to a fixed schedule. LLSNSs, on the other hand, allow for participation at the user's convenience.

Classroom integration

If I think of my own experience, I suppose that my English improved since I stopped studying it in a scholar or university environment. But how did this happen? I think that it is by integrating little by little things I hear or read here and there, again and again. (French student learning English, cited in Sockett 2014, p. 83)

As opportunities increase for L2 learning informally, the question naturally arises of how teachers should integrate such activities into their classrooms. As students find and use informal learning resources, ignoring the usefulness of those activities in the classroom becomes increasingly problematic. Indeed, there is evidence that engaging in informal language learning online may lead to expectations regarding instructed language learning that may be disappointed: “Transitioning into the regimented and often mundane environments of the language classroom, they are asked to engage in a very different type of social practice” (Henry and Cliffordson 2015, p. 718). Such a situation is likely to lead to frustration on the part of both students and teacher.

If teachers ignore the benefits of informal language learning, the role instructed language learning itself plays may be questioned, particularly within the context of recent studies which point to greater language gains from learning informally. Cole and Vanderplank (2016) compare two groups of Brazilian learners of English, one using conventional face-to-face language instruction, the other being “fully autonomous self-instructed learners” (FASILs), who had received little or no formal instruction but had learned using online resources. The FASILs significantly outperformed the other group in a battery of language tests. The study shows “how the new affordances for naturalistic learning through the internet have transformed informal language learning, enabling significant numbers of independent, informal learners in foreign language contexts to achieve very high levels of proficiency” (Cole and Vanderplank 2016, p. 31). It also leads to the conclusion that language teachers need to make the availability and advantages of such resources known to their students (Godwin-Jones 2018a; Lehtonen 2017).

In practice, the extent to which teachers encourage the use of informal learning is not known, although a recent study asserted that “such links are not commonly made” (Reinders and Benson 2017, p. 571). Sockett (2014) calls for an “inverted pedagogy, in which the majority of work on language skills takes place outside of class time, the latter being devoted to supporting and scaffolding this process” (p. 138). Whatever the case, teachers are well served by leveraging students’ possible out-of-class learning experiences toward more collective learning opportunities (Murray and Lamb 2018). Sockett suggests using an LMS (learning management system) as a link between the classroom and online informal learning. Others suggest using “bridging activities” (Thorne and Reinhardt 2008). Warner and Chen (2017) advocate that students take on the role of ethnographers, analyzing language and culture in electronic exchanges, such as on Facebook. Thorne advocates moving in the direction of “structured unpredictability” in language-learning environments (Little and Thorne 2017, p. 17), with the classroom providing the structure and the online world providing the opportunity for unexpected and contextualized learning. He provides the example of using augmented reality to link place-based learning with classroom instruction. This, in fact, is the model supplied by mobile games authored by ARIS (augmented reality interactive storytelling engine) such as *Mentira* or *Chronos-op* (see Godwin-Jones 2016).

New devices and opportunities on the horizon

If the new technology threatens some professors with obscurity, others face obsolescence. Language instructors may someday be replaced by multilingual versions of Siri on your iPhone. (Delbano 2013)

Barcomb et al. (2017) suggests three levels of involvement for teachers in working with mobile and other advanced technologies, namely creating “adaptable materials, modifiable materials, and teacher-created materials” (p. 13). It is likely that most teachers will use ready-made mobile apps, rather than creating their own. Indeed, given the time constraints and technical expertise needed for creating mobile apps or games, Sykes (2018a) foresees the greater use of commercial games in mobile-assisted language learning. She envisions a future scenario in which digital games become a regular activity in the language classroom, leading to greater student motivation, as well as a continuity of in-school and out-of-class learning.

For this vision to become reality, teachers will need to be willing to allow the use of digital devices, including smartphones, in class. Although there are many teachers today who resist allowing this to happen, there is likely to be a shift in attitude in time, as the power of ubiquitous access to online learning resources becomes too evident to ignore (see Godwin-Jones 2018d). One of the helpful developments in that regard is the increasing integration of technology into teacher education, with more informal opportunities for learning, such as that supplied by the TESOL (Teachers of English to speakers of other languages) MOOC on the use of *Minecraft* in language learning (Kuhn and Stevens 2017).

While smartphones have already become widespread, other devices are arriving that hold promise for even wider online access. These include wearable devices such as smartwatches and virtual reality (VR) headsets. A recent project using VR points to this possible future, along with “serendipitous learning” (Vazquez et al. 2017). Currently, mixed reality programs rely on prepared materials, based on anticipated venues or sets of vocabulary. As improvements in AI (artificial intelligence) progress, along with faster and cheaper access to cloud-stored data banks, Vazquez et al. (2017) see the potential for a language-learning mobile companion, which can offer spontaneous language assistance and training.

One of the developing set of devices that seems likely to contribute to this stream of user data is intelligent personal assistants (IPAs). These are products which use advances in automatic speech recognition and augmented reality to respond to voice queries. There are studies using such IPAs – Apple’s Siri, Amazon’s Alexa, and Google Voice Search – for language learning. One of the findings is that, as the devices are designed to recognize standard native accents, they have difficulty with L2 speakers (Daniels and Iwago 2017; Dizon 2017). Google speech recognition was shown to be better at recognizing L2 speech and, since it features an open API (application programming interface), can be more easily integrated into other environments, including webpages (Daniels and Iwago 2017). Alexa has the ability to gain a variety of downloadable “skills,” which include apps such as Master Vocabulary. An interactive storytelling skill, *Earplay* for Alexa, was used with English as second language (ESL) students in Japan and proved to be useful in creating interactions in English (Dizon 2017). Another study using Alexa (Moussalli and Cardoso 2016) also reported generally positive results. Although most IPAs are built into smart speakers (such as Amazon Echo or Apple HomePod), they can be integrated into other objects, such as thermostats, refrigerators, or even lightbulbs. This “Internet of Things” offers interesting opportunities to embed language learning in the physical surroundings of the user. An open-source project describes creation of an IPA, Almond, that offers interoperability with household devices through open APIs in home automation systems (Campagna et al. 2017). It’s interesting to imagine how such capabilities might be used in environments such as the kitchen, similar to projects such as the European Kitchen (Seedhouse et al. 2014).

Similar kinds of real-world activities could be played out using the new set of smart wearable devices now being created. Google Pixel Buds, for example, have similar capabilities to IPAs and feature translation services (using Google Translate) in 40 languages. Pressing a button on one of the earbuds and entering a voice command will allow speech to be translated, playing the translation for the conversation partner, assuming both are wearing the

earbuds. Sykes (2018a) envisions using the Pixel Buds – or similar devices – for an activity taking advantage of both technology and mobility:

This might include an instructor walking around a museum or garden with his or her students deeply engaged in a game narrative that requires them to look up from their devices and really pay attention, adding a deeper understanding of the artifacts that they see. Similarly, community-based gamework might involve a homework assignment where learners are asked to explore their local neighborhood and create a small game representing that experience. (p. 221)

Although some might voice skepticism about the practicality of such cutting-edge projects, the reality is that many more such devices – and language-learning opportunities – are likely to be forthcoming. Some will likely never see the light of day (witness the demise of Google Glass), but others will surely offer powerful options to explore language learning in place-based and real-world contexts. The possibility of embodied learning contextualizes learning, making it both concrete and memorable.

The role of informal language learning in the future

The explosive access by young people to YouTube, Vimeo, Netflix, Amazon Prime, Google, Wikipedia, social media and an endless array of other services, has given them unprecedented access to English content. Not the dry, didactic content of the course and classroom, but content they crave and find compelling (Clark 2017).

Advances in the capabilities of intelligent services and wearable devices to provide both advanced language assistance/translation and language-learning support lead naturally to envisioning a future where there might be a quite different context for L2 use and therefore for L2 development. A central aspect of that future will be the respective contributions of formal, institutional language learning and informal, largely autonomous language development. A number of future scenarios can be imagined, discussed in this section.

Language learning becomes superfluous

The view that language teachers will be replaced by enhanced versions of Siri corresponds to the imagined era of transparent intergalactic and interspecies communication enabled by the “universal translator” of *Star Trek*, ubiquitous devices that instantly render utterances understandable no matter in what language they are spoken, just like the translation fish in the *Hitchhikers Guide to the Galaxy*, but without the squeamishness of having to insert a fish into ones ear (Adams 1979). Indeed, as discussed here, smart assistants/translators in wearable devices have indeed become available, moving us toward the vision of *Star Trek*. There is no doubt that advances in AI will steadily improve both the speed and quality of voice recognition, speech synthesis, and translation. The deep machine learning, interconnected neural networks, and massive data used by companies such as Google to power their translation services, create systems which learn, over time, to produce translations and synthetic voices ever closer to real human speech (Lynn 2016). Taking the sci-fi scenario even further, one can envision systems which are so advanced that they can do without speech input altogether, directly accessing our brain’s waves to reveal and transmit thoughts. The NeuroLink project of Elon Musk (interfacing with the brain through “neural lace”) and Mark Zuckerberg’s mind-scanning project (automatic typing as you think) point in this direction (Clark 2017).

While automatic translation may become capable of convincingly idiomatic renditions of sentences and even of rendering connected discourse into the target language, that ability is

not likely to convey the totality of human speech. Research in sociolinguistics, second language acquisition, and intercultural communication have demonstrated the central role of culture in communication (Byram et al. 2017; Kramsch 1998; Larsen-Freeman 2018). To be effective, speech needs to be linguistically accurate, but also pragmatically appropriate. How we use language depends entirely on the context of the encounter, i.e. the environment in which the conversation takes place, its purpose, and our interlocutor. Crucial is our knowledge of and relationship to the other person(s). This will determine the language register used, forms of address, available abbreviated speech patterns, the appropriateness of code-switching or use of humor, etc. The smartest and fastest computers are unlikely to have all the necessary information to adjust speech output accordingly.

Fully autonomous language learning

Assuming that in future L2 abilities are still needed to communicate across cultures, does this mean that formal language instruction is needed as well? Not necessarily. It seems likely that the trend we are already seeing of young people worldwide using online resources to bypass institutional learning will continue, possibly even accelerate, especially for learning English. This reflects both the widely available set of engaging English language materials (movies, TV programs, pop music) as well as the intense interest in learning English as a means for personal and professional advancement. In addition, it is likely that for many would-be English learners, formal instruction may not be locally available, may be too costly, or may be of unsatisfactory quality. As this volume amply illustrates, studies show that language learning can be effective in autonomous learning environments. On the other hand, this method of learning can be inefficient, with learners spending inordinate amounts of time searching for and collecting materials. Independent learners could profit from the use of recommendation systems, whether they be human (peer recommendations, engagement with other learners) or algorithmic, based on knowledge of the user's background, needs, and interests.

Recommendation systems for consumers are familiar from commercial vendors (for music, books, and movies). Companies like Amazon and Netflix build models of likely consumer preferences based on information already held about the individual (age, gender, profession, region, etc.) and on actions taken (i.e. purchases, browsing). Similarly, learner profiles have been built into intelligent tutoring systems (Heift 2010). Open learner models can build a personal profile which can "enable filtering of content so as to direct learners to resources likely to be most appropriate for their proficiency levels, learning goals, and content preferences" (Godwin-Jones 2017a, p. 8). Dedicated recommendation systems for specific language areas have been created, such as suggested readings for ESL students (Hsu et al. 2013) or for vocabulary learning (Nikiforovs and Bledaite 2012). Such recommendation systems are especially valuable for independent learners, who do not have the advantage of guidance from tutors or teachers. They are enhanced by a social component, with learners profiting from both programmed recommendations and peer suggestions. The social reading platform eComma, presents an example of such a system, combining leveled materials and user annotations (Blyth 2014). Such an approach can guide users toward appropriate learning materials as well as offering a platform for reflection and exchange.

Integrated formal and informal learning

The opportunity for reflection on learning is one of the strongest advantages of embedding language learning within a structured environment, which would normally be a formal course, delivered face-to-face or online. Ideally, a foreign language learning environment

will supply both the invitation to self-reflection and self-regulation and help/support for continuing learning outside the classroom. This latter component might include guiding students toward metacognitive knowledge about the process of language learning while also reviewing with them specific language tools and services. Having teachers model learner behavior can be an important ingredient in learner motivation. Encouragement might come through having students in class or in online discussions share resources found online. Students might be encouraged to earn digital badges (Yang et al. 2016) or achieve other forms of recognition online. Another route is to invite students to find and create learning materials for classroom use (Warner and Dupuy 2018). Godwin-Jones (2018b) describes a project in which intermediate-level students curate, share, and evaluate authentic online materials in the target language (videos, music, websites, etc.), serving to build both digital literacy and knowledge of sources for online language learning. Select curated materials (those with the highest peer ratings) are in turn transformed into interactive learning materials by student-professor development teams and shared as open educational resources

One of the strongest benefits of involving students in the selection of learning materials is leading them to reflect on both linguistic and cultural issues in language learning. Encouraging students in accessing online materials to move beyond stereotypes and the cultural mainstream (e.g. investigating refugee populations or minority groups) can serve to open their eyes to multicultural and multilingual realities, often neglected in formal instruction in favor of presenting monolithic national cultures. Moving language instruction in this direction has the potential to build intercultural competence and a sense of global citizenship (Byram et al. 2017; Larsen-Freeman 2018). The hope is that students will become not just effective informal learners, but responsible world citizens as well, something increasingly needed in all parts of the world today.

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