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Contextualized vocabulary learning

Robert Godwin-Jones, *Virginia Commonwealth University*

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Evolving Views on Vocabulary Development

Lexical development in a second language (L2) is increasingly understood to be complex and multi-dimensional (Kim, Crossley, & Kyle, 2018; Pellicer-Sánchez, 2016). Knowledge of a word or expression may be at different levels of depth—that is, recognizing the word receptively, being able to use it productively, knowing its associated word family, or being able to understand and use it in non-literal expressions and pragmatically appropriate ways (Elgort, 2017). Vocabulary learning occurs over time and is dependent on learner actions and on multiple encounters with a given item. Words are "open systems" (Churchill, 2007, p. 354); word knowledge emerges dynamically and contingently through context and user interactions (Kasper & Wagner, 2018). The process involved thus invites the application of a dynamic systems or complexity theory (CT) perspective (Godwin-Jones, 2018a).

Research in cognitive linguistics has led to new insights into the process of vocabulary acquisition (Bisson, Van Heuven, Conklin, & Tunney, 2013). Studies have shown, for example, that words have psychological properties—subjective characteristics such as the level of concreteness or imageability—which affect retention (Crossley, Kyle, & Salsbury, 2016). Such insights have been confirmed and expanded through eye-tracking research that looks at vocabulary comprehension in L2 reading (Pellicer-Sánchez & Siyanova-Chanturia, 2018). At the same time, work in corpus linguistics has changed how we understand the nature of language and language learning (Rousse-Malpat & Verspoor, 2018). Native speaker corpora show how language is actually used, while learner corpora provide insights into the process of L2 development (Boulton & Cobb, 2017; Godwin-Jones, 2017a).

Findings from corpus-based studies, discourse analysis, and other fields have shifted our understanding of language from a model based on rules to one based on patterns of usage (Ellis, 2017). One of the key takeaways from this usage-based view of language is the importance of formulaic language or lexical chunks, that is, fixed or schematic multiword units in both written and spoken modes (Elgort, 2017; Lin, 2014). This has had a significant impact on research in L2 development, including the learning of vocabulary, with a growing recognition of the importance of moving beyond single words and direct first language (L1)–L2 equivalencies (Coxhead, 2015; Elgort, 2017). Eye-tracking technology has provided insights into how idioms and other formulaic expressions are accessed in L2 reading (Carrol & Conklin, 2017).

Another development in second language acquisition (SLA) research that has had an impact on our understanding of L2 development is the use of multimodal conversation analysis (CA) to examine learners in the wild, people using and learning language while engaged in everyday social, educational, professional pursuits (Eskildsen, 2018; Theódórsdóttir, 2018). Results of such studies question the reality of traditional dichotomies like learner and user, native speaker and novice, L2 input and output. Studies in informal language learning point to the affordances for L2 learning, including vocabulary development, through the online consumption of texts, music, and videos (Godwin-Jones, 2018a). Interactions through gaming, social media, or virtual worlds represent further channels for L2 vocabulary expansion.

While vocabulary development is mostly peripheral to entertainment or socialization, there are

opportunities for explicit learning which can complement incidental learning. In fact, recent work based on usage-based language theories calls for a combination of inductive learning and explicit instruction (Ortega, 2015; Tyler & Ortega, 2018). A common denominator in current views and practices concerning vocabulary learning is the recognition of the centrality of context, whether that be in independent reading, watching, or listening in the L2; interacting with other L2 users online (social media, gaming, fanfiction, etc.); accessing sample expression use through corpora; using L2 material supplied with glosses or other comprehension and learning assistance; or encountering and learning new words through everyday conversations in the target language. Contextualized encounters are likely to enhance the chances of retention, as words and expressions are used in meaningful, and therefore more memorable, ways. In this column we will look at different online contexts of language use that enable vocabulary expansion and enrichment.

Extensive Reading

We learn our L1 through exposure to the language around us. That occurs in sufficient quantity so that we learn words and expressions with little conscious effort (Nation, 2007; Sternberg, 1987). Usage-based views on language posit that we learn a L2 in the same way, through rich input, with what we are exposed to most frequently being learned most quickly and thoroughly (Tyler & Ortega, 2016). One of the key factors in incidental vocabulary learning is frequency of exposure. Multiple encounters are needed to establish a lasting connection between form and meaning. Studies of incidental vocabulary learning have varied in the number of encounters necessary from 6 (Rott, 1999) to 8 (Horst, 2005) or 10 (Webb, 2007). Waring and Takaki (2003) reported that 20 or more encounters might be necessary. Caution is needed in generalizing, as a good number of factors other than frequency may affect retention (Kim et al., 2018). Words vary in characteristics affecting learning (Garner & Crossley, 2018). Concrete and familiar terms (e.g., *house*), for example, are more easily retained than abstract nouns (e.g., *justice*). The medium may be a factor, as words spoken may have particular salience depending on context and mode of speech (Behney, Spinner, & Gass, 2017). Salience is likely to be conceptual but could be grammatical as well, in that particular word combinations or schema may be memorable (Crossley et al., 2016). If in written form, illustrations in the text may play a role (Stanley, 2015; Webb & Chang, 2015). Individual differences among learners are of course important as well, including age, background knowledge, and proficiency levels, as well as motivation and cognitive abilities (Hu & Nassaji, 2016; Kim et al., 2018; Kramsch, 2002). Of course, computer-assisted language learning (CALL) has from its earliest days looked to *constructed salience*, or enhancing the prominence of targeted items (Behney et al., 2017), to promote *noticing* (Schmidt, 1990) and potential uptake in L2 instructional materials (see Otto, 2017).

Language learning in formal instructional settings does not typically supply the repeated exposure to words and expressions for inductive, incidental learning (Lin, 2014). Indeed, the emphasis in most teaching contexts will be on memorization and on learning through elicited output (i.e., using lexical items in writing and speaking). Repeated exposure to introduced lexis is limited, often due to curricular considerations, namely the need to move on to the next unit and to a new set of vocabulary. This varies of course with the instructional model and the level of instruction. Ideally, one hopes that students will gain sufficient interest in the target language so that they will look for opportunities outside of class for L2 use and development, potentially leading to greater L2 vocabulary expansion. Classroom teachers will normally alert students to such possibilities. Today, those opportunities will overwhelmingly be online (Godwin-Jones, 2018a). The availability of authentic language materials in all languages and modes (e.g., text, audio, and video) enables learners to find L2 content which fits their needs and interests. Recent studies have shown how online resources can contribute to L2 learning, including incidental vocabulary learning (Cole & Vanderplank, 2016; Sundqvist & Sylvén, 2016).

The learning experienced through frequent watching of videos, from gaming in the L2, or by way of other recreational or social activities, is incidental to the purpose of engaging in those online activities (Sockett, 2014). Online reading can occur under similar conditions, although the purpose may well be information retrieval or reading for professional reasons. However, many online readers may be engaging in that activity

for pleasure, through reading stories, novels, or nonfiction. This is quite different from how L2 texts are used in basic language instruction, namely treated as vehicles for examining language and culture. In the language classroom, that process will normally translate into close readings that analyze structural and lexical properties. Reading online, if not connected with course assignments, is likely to be a quite different experience from intensive reading, with the emphasis solely on reading for meaning. Vocabulary knowledge may be expanded, but that will be an incidental by-product. This is the theory behind the concept of extensive reading, which has been used and studied for some time in both formal and informal language learning (Peters, Heynen, & Puimege, 2016; Waring, & McLean, 2015). Other terms have been used for this method, including *pleasure reading*, *sustained silent reading*, or *free reading* (Chen, Chen, Chen, & Wey, 2013). The idea is that L2 learners engage in a high volume of reading, normally outside class, with materials of their own choosing and at a level of difficulty that allows for easy understanding and a pleasurable reading experience. Learners are encouraged to read whole books, rather than excerpts. Extensive reading has been championed by Krashen (1989) as evidence for his input hypothesis, namely that this activity supplies comprehensible input as a condition for L2 acquisition.

There has recently been a significant rise in interest in extensive reading for language learning. Dao's (2014) meta-analysis of research in this area points to studies that show improvement in a range of L2 areas including vocabulary competence and reading comprehension and speed. Allan (2009) points out that not only does extensive reading develop reading skills, but it also "consolidates previously learned grammar and vocabulary" (p. 63). Studies have shown that the pleasure and sense of accomplishment in reading L2 books independently can be highly motivating (Arnold, 2009; de Burgh-Hirabe & Feryok, 2013; Ro, 2013). That includes the possibility of engaging or re-engaging demotivated students (Day & Robb, 2015). The rich supply of digital texts online has given a new vitality to extensive reading (Pino-Silva, 2006; Sun, 2003), especially through the availability of e-books on mobile devices (Dao, 2014; Godwin-Jones, 2010). Instructional L2 units have developed programs that take advantage of the vast variety of texts online to ensure learner choice (Mercado, 2015) and have created online challenges and reader rankings to encourage more reading (Day & Robb, 2015; for an online implementation, see mReader).

While the emphasis in extensive reading is traditionally on learners reading independently without assistance or monitoring, there is also the possibility of connecting the experience to explicit language learning, described by Pellicer-Sánchez (2016) as "semi-incidental acquisition" (p. 25). Several recent studies have looked at enhancing the learning potential of extensive reading through the use of data-driven learning (DDL) using corpora. Allan (2009) created a small corpus from graded readers and used DDL-based training and exercises to help students acquire lexical chunks. Hadley and Charles (2017) had students directly access a corpus compiled from the Oxford Bookworms graded readers. After a half hour of silent reading, the Japanese EFL students in the experimental group used printed DDL materials to find and categorize patterns in the lexical items. While Hadley and Charles experienced considerable resistance from the students in the experimental group (likely because this was an extra, time-consuming task), other studies have shown more positive results in supplementing inductive learning with explicit instruction (e.g., Khezrlou, Ellis, & Sadeghi, 2017; Lee, Warschauer, & Lee, 2017; Pellicer-Sánchez, 2016). One approach is to integrate other media into the reading process. Webb and Chang (2015) added audio recordings to students' extensive reading in graded readers and found higher vocabulary gains than with the control group using a conventional textbook. Brown, Waring, and Donkaewbua (2008) used a similar approach, also with positive results. Chun (2011) has pointed out that, in fact, CALL supplies multiple opportunities for optimizing extensive reading for vocabulary learning and the development of reading ability.

Discovering and Working With Online Texts

One strategy to ensure frequency of encounters in incidental vocabulary learning is to help students find texts which include repeated occurrences of target items. This can be achieved in different ways. Texts can be chosen which already fit that requirement. Alternatively, texts can be arranged or modified to fit needs. Digital texts offer the opportunity to statistically determine lexical suitability, modify texts as needed, or

enhance the texts (Pellicer-Sánchez, 2016). Ghadirian (2002) developed a program (TextLadder) to arrange a set of texts from *Voice of America* news broadcasts so that target items would be encountered at least five times. Brown and Eskenazi (2004) used a software program called Readers Practice (REAP) to enable students or teachers to find texts on the web that satisfy particular lexical requirements. There are online tools that analyze texts for L2 readers, based on vocabulary range or sophistication and text complexity, as recently discussed by Pilán, Vajjala, and Volodina (2016) and Xia, Kochmar, and Briscoe (2016). Online services are available for analyzing texts for readability in English (Text Readability), in German (Lesbarkeitsindex), and in Chinese (Sung, Lin, Dyson, Chang, & Chen, 2015). Chinkina and Meurers (2016) developed a web-based corpus query system designed to allow teachers to find linguistically appropriate texts. Recommendation systems have been developed, such as that described by Nikiforovs and Bledaite (2012) for vocabulary development. That system relies on learner profiles to provide sequential recommendations designed to combine likely known vocabulary with a subset of new expressions (see further discussion in Godwin-Jones, 2017c).

My VLS-Reader (Hsu & Ou Yang, 2013) features a variety of ways readers can enhance their opportunities for vocabulary learning in an online environment. Those include supplying preliminary word lists, review reminders, and sub-windows showing contextual meanings of selected items. The Mywordtools system similarly supplies learners with a variety of tools to explore word meanings (Lan, 2013). Students in an experimental group using the tool were also encouraged to share their learning experiences with others. That group outperformed both those who did not use Mywordtools and those who used the platform but without sharing. Liu (2016) found that having students share the concept maps created for targeted vocabulary items also enhanced learning. Of course, helping students understand written texts and learning vocabulary has long been done in CALL through a variety of add-on text enhancement and input enrichment methods (Marefat & Hassanzadeh, 2016). For texts, the principal method has been glossing. Multiple studies have shown that glossing items aids vocabulary development (Boers, Warren, He, & Deconinck, 2017; Chun, 2011; Khezrlou et al., 2017). Results have varied depending on factors such as student learning levels and type of gloss (e.g., L1 translation, L2 explanations, graphics, audio, video, or a combination thereof). A recent study (Khezrlou et al., 2017) used multimedia glossing and found that groups explicitly instructed to use the glosses performed better in terms of both reading comprehension and vocabulary development. The highest performing group, however, were those who were given a list of targeted items with L1 translations before reading and told to study the list. Similar positive results in using multimedia glosses were reported by Rouhi and Mohebbi (2013).

A "multi-componential approach" to illuminating the meaning of vocabulary items in texts (Pellicer-Sánchez, 2016, p. 99) is in line with the *redundancy principle* that elaboration helps retention (Hu & Nassaji, 2016; Khezrlou et al., 2017). Too much elaboration, however, may be distracting or cause a cognitive overload (see the discussions in Lan, 2013; Lan, Fang, Legault, & Li, 2015). That may be particularly an issue with lower-level learners (Peters et al., 2016). Boers et al. (2017) recommend the use of L1 translations for novice learners, rather than graphical or other media glosses. Ideally, glossing implementations could be adaptive and flexible, providing options to users in terms of nature and extent of glossing information, ranging from L1 equivalents to multiple, corpus-retrieved examples (Chun, 2011).

DDL approaches can be helpful in supplying corpus-derived assistance in both the reading process and in explicit vocabulary study. Daskalovska (2015) found direct corpus consultation by students worked well for simple collocations but not as well for more complex constructions. Lee et al. (2017) added to their digital readings glosses which linked targeted items to three sample sentences taken from a corpus, highlighting the use of each item in a key word in context format. A second experiential group viewed the concordance lines, but also was shown a dictionary definition. It was the second group that performed best on vocabulary post-tests. Using a definition apparently helped users to confirm assumptions or correct wrong inferences (see Godwin-Jones, 2001). Corpora can be particularly useful in helping to learn multi-word constructions, in which grammar and lexis are inseparable (Ellis, 2017). Shin and Kim (2017) explored teaching the use of particles in English through a learner corpus as a consciousness-raising exercise. Article use in English is notoriously difficult to learn, as rules take the learner only so far. The

positive results were shown to be tied to students working with articles in the context of lexical bundles, and viewing them as illustrations of usage patterns, rather than rules. Vyatkina (2016) used corporal consultation to help students learn verb-preposition combinations in German. Such "complex lexico-grammatical constructions" (p. 211) are better learned in context as connected chunks of language. This corresponds to usage-based views that "a language user has available to him or her a large number of semi-preconstructed phrases that constitute single choices, even though they might appear to be analyzable into segments" (Sinclair, 1991, p. 100).

Part of the rationale for using corpora for learning constructions such as collocations is to emphasize to learners the importance of phraseology, i.e., the central role played by fixed expressions in language use (Li, 2017). DDL can also be helpful in understanding that genres of written or spoken discourse use and recycle particular constructions (see Ackerley, 2017). While this may be something of which students become aware themselves by browsing and analyzing patterns, there may be a need for explicit instruction. Such is likely the case for lower-level students (Shin & Kim, 2017). It may also be needed for low-salience features of lexical chunks such as case endings, which do not affect meaning (Vyatkina, 2016). Philip (2010) points out that for today's students, the ability to query corpus-based resources to obtain information or confirmation on the fly (the author labels this *hit-and-run DDL*) corresponds to "learners' demands for faster, better, cheaper, and personalized responses to their language queries" (p. 14). The *vignettes* of individual student language learning included in each chapter of the book on language learning beyond the classroom by Nunan and Richards (2015) illustrate the validity of this view of student preference for seeking immediate solutions (online or in-person) to L2 learning needs.

Extensive Viewing

A decade ago, Webb (2009) discussed the benefits available in English as a second language settings to watch English language television programs, whereas in English as a foreign language (EFL) contexts, "learners would have little opportunity to watch L2 programs" (p. 336). As recently as five years ago, Vanderplank (2016; a published account of a 2013 plenary talk) concluded that "TV has still not developed as a global resource for language learning and teaching" (p. 240). How times have changed! English language television programs are now widely available online, through streaming services such as YouTube or Netflix. Many videos are available for downloading as MP4 files, although often with questionable legality. This is true not only for English language videos, but also for other languages as well. This represents a bonanza for incidental L2 vocabulary learning enabled by several developments including (a) the wide availability of film and television subtitles and captions, (b) the possibility of watching an entire series of a TV program online, and (c) the fact that corpora of scripts and subtitles have become available.

Studies have shown that captions (designed for the hearing impaired, in the original production language) and subtitles (in the viewer's L1) can enhance listening comprehension and aid in vocabulary development (Perez, Van Den Noortgate, & Desmet, 2013; Peters et al., 2016; Vanderplank, 2016). The national TV networks in many countries dub movies or TV shows into the local language (for a discussion, see Sockett, 2014). However, online versions (or DVDs) are often available with optional captions and subtitles. It is especially helpful for language learning if subtitles can be turned off and on (Peters et al., 2016; Sockett, 2014). This allows learners to watch the same videos repeatedly, using titles or captions as scaffolding until they are able to view and understand without assistance. Vanderplank (1988) describes this process of watching and reading as providing instant feedback to learners. If subtitles are not embedded or available in the source used, many can be freely downloaded from online sites (Hanf, 2015).

One of the advantages of TV programs compared to feature films is their shorter length, making them more versatile for use in language learning, both in the classroom and at home. Additionally, many TV series, especially comedies and dramas, are episodic, with the same group of characters experiencing similar situations from week to week. This is an ideal set-up for learning from a usage-based perspective, since the spoken language tends to be continually recycled as the characters experience different, but analogous, storylines in each episode. For that reason, Webb and Chang (2015) advocate that learners use a *narrow*

viewing approach, watching all episodes of a series from the beginning. This can have a motivating effect, as learners becoming interested in following the further twists and turns undergone by characters they have gotten to know.

Finally, researchers have studied the language used in TV shows and found that it corresponds in particular genres (especially comedies and dramas) to everyday language, at least for English language TV. Lin (2014) compared the language as collected in the iTV corpus, consisting of the subtitles of readily accessible TV programs on the British Broadcasting Corporation's web-based video streaming facility, with that from the spoken component of the British National Corpus (BNC). His study, as well those of others (e.g., Rodgers & Webb, 2011; Webb, 2010, 2011), show that the language on TV corresponds to that of everyday speech. Webb and Chang (2015) looked in particular at the use of formulaic language and found that in that area as well, the language used on TV corresponded to recorded speech in the BNC. Sockett and Kuysk (2015) created a corpus of scripts from popular US television series and identified frequently recurring 4-grams in the corpus, set patterns of four consecutive words. They tested French students learning English who were regular viewers of the videos and found that they had greater knowledge of the 4-gram constructions identified as most frequent than did a control group not having watched the videos. Ortega (2015) points out that learner exposure to formulaic expressions through multimedia can contribute to *idiomaticity*, with the likelihood that L2 learners will use encountered constructions in pragmatically appropriate ways.

In many EFL regions, written material often dominates the curriculum at the expense of spoken materials (Webb & Chang, 2015). The multimodal character of TV can offer a welcome supplement. Actors on TV provide examples of effective spoken communication that can supply potential models for combining words, paralanguage, and body language to express meaning. It is also the case that the native-level prosody of actors, such as the intonation used in formulaic expressions, can be very helpful for learners (Lin, 2012). On the other hand, depending on their proficiency level, learners may be initially overwhelmed by the language used in popular target-language TV programs, which tends to be highly colloquial and spoken at normal speed. Students already have experience watching TV in their own culture and L1 and are likely to expect initially to understand just as completely in the L2, using the same medium (Vanderplank, 2016). This is an area where explicit instruction in the classroom could be helpful, even though the extensive viewing would occur outside of the class. Classroom training might include playing and analyzing sample target-language TV and discussing viewing strategies (see Webb & Chang, 2015).

Vocabulary Development From the Perspective of Complexity Theory

CT, or complex dynamic systems theory, is being seen as a useful approach in understanding vocabulary development, one that compliments usage-based views on language (Churchill, 2007; Zhao & MacWhinney, 2018). CT stresses the importance of initial conditions on potential outcomes. Emerging results are not necessarily commensurate with effort, as effectiveness in learning is shaped by different learner characteristics that come together in a variety of combinations to determine outcomes (Godwin-Jones, 2018a). This is true for vocabulary development, since word knowledge, as Kramsch (2002) points out, is provisional, always subject to further expansion. Our initial understanding may be quite limited. As Philip (2010) shows, learners might initially have a simplistic knowledge based on equivalency with L1 lexis, and only through repeated exposures over time (as well as possibly through explicit instruction) can they broaden their understanding of an item to its use in collocations or idiomatic expressions. Elman (2011) points to the fact that stages of vocabulary knowledge are in fact often non-native in their nature before arriving at pragmatically appropriate levels. In CT, attractor states describe stages of stability in intersecting systems, as is this case when a learner reaches a plateau that only shifts under changes in subsystems (i.e., through reading, encounters in different contexts, corrective feedback, etc.). The incremental nature of vocabulary development—particularly the understanding of lexical chunks—points to the importance of studying development over time, a key aspect of CT (Zhao & MacWhinney, 2018). This provides insight into emergent outcomes affected by changing factors in learning trajectories (Lowie, 2013). Longitudinal studies are especially helpful in understanding the dynamics at work in combinations of inductive and

explicit processes. Using CT, Zheng (2016) provides a model for this kind of research, looking at the development of lexical sophistication and the frequency in the use of formulaic language of Chinese learners of English over a 1-year period.

Depending on the learning environment, another factor, especially in L2 contexts, is environmental conditions. Churchill (2007) provides a fascinating case study of demonstrating the evolution in the knowledge of one expression in one learner (the author himself) as the lexical item (a Japanese expression related to drawing blood) was encountered in a variety of ways over time. Those included overhearing conversations of doctors with nurses, reading the word on a medical chart, hearing a variant used on a Japanese television news broadcast, reading it in a newspaper, and having medical personnel tell him about a procedure he was to undergo. The study describes well the gradual and non-linear path of learning, featuring zigzags and an unpredictable process. As the author goes from understanding the single word meaning to comprehending its use in phrases, his knowledge undergoes a "progressive coordination of relationships between forms (meaning, collocations, derivatives, etc.) and between ecology and forms, for and by the learner" (p. 343). Hauser's (2017) study using CA of one Japanese learner acquiring knowledge of one English word (*near*) shows that learning is particularly likely if the item to be learned is immediately useful to the learner.

The gradual and individualized nature of vocabulary learning is evident in another auto-ethnographic study that chronicles the author's experience of *Learning Spanish by using it* (Stanley, 2015). She discussed the circular or cyclical path often evident in gaining a depth of understanding of individual words and expressions. She describes hearing particular words repeated in casual conversation, which, because heard often, she would look up at home, if the precise meaning was not clear from the context. Later, she would try out using the word herself in conversation. In the process, she describes the traditional distinction in SLA between input and output as blurry:

> When I sat in the market with my book, I was learning a few words from the page (input) but I was also speaking to people (output), and sometimes those people were explaining new words (input) or I was trying to make meaning without the right words (output) and they would help me fill the gaps (input). The two processes are blended. (p. 246)

This echoes the call from Crossley et al. (2016) for a more nuanced distinction between input and output. It also reflects Eskildsen's (2018) characterization of continuing to make that distinction in SLA as "obscurantism" (p. 59), as, from a usage-based perspective, "use and acquisition are essentially inseparable" (Eskildsen & Majlesi 2018, p. 3).

Stanley (2015) describes learning lexicogrammar as detective work. Learning chunks of language involves listening and discovering, as in her growing understanding of the negative imperative in Spanish:

> As people spoke to me in Lima I would replay their words in my head, making sense of things and sometimes trying them out for myself. A street seller went off to find small change and told me to stay (*no se vaya*) until he returned. I pondered this new construction, not learning its grammatical label until years later. I had never noticed it before, and had certainly never used it. To learn language by speaking it, one must become a language detective: a sleuth, an interrogator of words. I saw the same construction used in the title of a Jaime Bayly book, *No se lo digas a nadie*, on sale on every street corner that year. Both phrases are commands: Don't go! Don't tell anyone. I tried using this structure in all commands, and sometimes it worked and sometimes it caused looks of slight puzzlement. This was the negative feedback I needed to tell me that something wasn't quite right. So I restricted its use to phrases in which I knew it worked: *¡no me lo digas! ¡no te vayas!* Ah, these all start with no, maybe it is not all commands, only the negative ones? I tried that and it worked better. (p. 247)

This passage illustrates L2 development over time, largely through a trial and error process. The detective role the author describes corresponds to how language learning is viewed from usage-based and complexity theories. L2 users pick up bits and pieces from encountered language usage and use them as cues and clues

for their own formulations, gradually enhancing their depth of knowledge. The environment around the user—through encounters with objects (e.g., the title of a popular novel) and people (e.g., the street vendor's remark, puzzled looks)—plays a major contributing role. The passage also documents the natural convergence of form, meaning, and syntax in the learning process.

In addition, the preceding passage by Stanley (2015) demonstrates the advantage of the learner's awareness of strategies for language development. Recent studies have shown that learner effectiveness in incidental learning can be enhanced through appropriate learning strategies. That might involve maintaining a vocabulary notebook or online journal, as described by Walters (2015). Classroom instruction in strategy development can be effective, as discussed by Hsiao, Lan, Kao, and Li (2017). Alternatively, suggestions might come from social media, connecting with other learners through online communities of interest. Lin and Siyanova-Chanturia (2014) describe how a participant from Hong Kong improves her approach to English language learning through peer interactions on Twitter and Facebook. This type of communication can occur through the use of social or collaborative reading tools such as eComma (Blyth, 2014) or HyLighter (Thoms & Poole, 2017). A student using eComma in a Chinese language course commented, that "just highlighting a single word and asking what it means is something you could ask a dictionary, but something like this [i.e., eComma], or something like 'how does, why does this work in this sentence' is something you can really only ask of a group" (Thoms, Sung, & Poole, 2017, p. 45). Yeh, Hung, and Chiang (2017) describe the process of peer sharing annotations on text features (through GoogleDocs) as "reciprocal teaching" (p. 35). The usefulness of social and collaborative dynamics in vocabulary development reflects sociocultural and ecological approaches to SLA, which emphasize consideration of the social environment in which L2 development occurs (e.g., Kramsch, 2003; Lantolf & Thorne, 2006; van Lier, 2004).

Embodied Learning

Stanley (2015) describes how she learned the Spanish equivalent for *slippery*, namely from a companion with whom she was climbing rocks, who warned her that they might be *resbalosas*. The real-life setting—and the heightened emotional state through the potential danger—likely ensured that the word was internalized. An interesting account of the importance of the embodied learning of vocabulary is described in Svennevig (2018), based on the experience of one individual at work. A migrant worker in Norway used largely physical actions in the work environment to discover needed Norwegian expressions. Those included pointing gestures, the manipulation of objects, and the extensive use of deictic verbal expressions (e.g., *that one over there*) to engage with coworkers to discover collaboratively the needed expression. Eskildsen and Wagner (2015) use multimodal CA to analyze how the use of two propositions (*under, across*) are learned by a group in a classroom setting. This study shows that even in instructed settings, lexicogrammatical learning is not a simple process, but involves getting acquainted with lexical items "in a range of different relevant situations" (p. 289):

> Carlos went from displaying understanding through embodiment and translation into the L1, to using it when the term had been provided already, to ultimately using it spontaneously. However, even in the spontaneous uses, he kept employing the same or similar gesture as he did when first encountering the word in class which shows the fundamentally embodied nature of language. (pp. 290–291)

The authors assert that vocabulary learning reflects Vygotskian internalization and Bakhtinian appropriation processes that "L2 vocabulary learning appears to be a very slow, gradual, and embodied process of learning to control semiotic resources in situated settings" (p. 292).

There is, in fact, a growing recognition of the importance of physical actions and environmental factors in language learning (Ortega, 2017). Reported experiments with usage-based approaches to language learning in Vietnam and the Netherlands found that illuminating learning materials—movie clips or narrated stories—through the use of gestures, eye gaze, and body language enhanced learning (Rousse-Malpat &

Verspoor, 2018). Comparisons with the control group, which experienced a traditional explicit and rule-based approach, found that the experimental treatment yielded better retention and proficiency development. A similar study in Sri Lanka, using the enhanced movie clip approach in an online environment showed even stronger learning benefits (Rousse-Malpat & Verspoor, 2018). This would seem to provide a good rationale for further exploration of vocabulary development in virtual and immersive environments.

There are studies that have explored vocabulary learning in virtual environments such as Second Life. Lan et al. (2015) found that for English speakers learning Chinese, the manipulation of and zooming in on 3-D objects in Second Life while hearing the corresponding Chinese expressions aided vocabulary retention. The authors conclude that the "virtual 'whole body' interaction with the environment through these avatar-based social immersions may provide a rich learning experience comparable to, if not better than, that provided by the real natural learning environment" (p. 673). Studies of language learning through virtual gaming environments have also shown that the potential for language learning is aided by the embodied presence of the learner in the virtual environment. Newgarden and Zheng (2016) point to the empowering agency of avatars in World of Warcraft to "gesture, emote, speak, and move about an expansive virtual space" (p. 276). Studies of online gaming have shown the richness of language use in those environments as well, as players are "exposed to huge amounts of text" (Scholz & Schulze, 2017, p. 108). Other studies have shown how gameplay in the L2 can enhance vocabulary learning (Jensen, 2017; Shintaku, 2016; Sylvén & Sundqvist, 2012). Gains come through gameplay (the necessity of understanding names of game objects, descriptions, instructions, and feedback from other players or non-playing entities) and participation in associated activities such as fan sites. The process of embodied connections to learning in gaming or in other immersive environments may lead to the emotional investment of the learner in the virtual environment, creating hospitable conditions for lexical retention.

Another approach that involves physical movement is to develop learner lexicons through manipulation of space and objects. This was in fact a major feature of Gattegno's (1963) *silent way* of language instruction, which relied heavily on the use of colored rods. More recently, augmented reality (AR) has offered new approaches to language learning through encounters with objects triggering information retrieval, such as an identifying label, translation, or multimedia gloss (see Godwin-Jones, 2016a). AR can be used to supply cultural as well as linguistic information when using an app such as wikitude to identify landmarks, buildings, or businesses and providing relevant data. AR could enhance projects that explore *linguistic landscapes*, that is, culture and language learning through encounters with language as used in urban settings (e.g., ads, billboards, signs, menus, etc.). A recent study on linguistic landscapes concludes that "vocabulary learning turned out to be the most important advantage of using linguistic landscapes in foreign language learning" (Wilton & Ludwig, 2018, p. 87). Using mobile devices in projects involving learners exploring L2 cultural sites provides not only opportunities for the use of AR, but also the possibility of students using cameras and mobile journals to record and share experiences related to language learning (see Godwin-Jones, 2016b). That might include maintaining a vocabulary log with the possibility of gradually adding to the depth of understanding of lexis through noting idiomatic and collocational uses.

Lessons From Vocabulary Learning in the Wild

Compared to classroom instruction, language learning in the wild can be "hugely complex and unpredictable" (Theódórsdóttir, 2018, p. 36). Having L2 learners record encounters that are then transcribed and studied using CA has demonstrated the validity of that view. Interestingly, this type of research has shown that the most frequent learning activity in informal settings is word searches. The examples studied give evidence through CA of the largely collaborative process of resolving word searches in encounters between learners and proficient speakers (Eskildsen, 2018; Eskildsen & Majlesi, 2018). In the process, participants' identities are co-constructed, blurring the distinction between novice and expert. Such research has the potential to inform both online language exchanges and classroom interactions. Given the intense current interest in telecollaboration for language learning, recordings and analyses of interactions such as word searches in online partner exchanges would be welcome. They would be especially valuable if they

included video recordings, so as to capture nonverbal actions. It would be instructive to compare the dynamics with those characterized by the works of Theódórsdóttir and Eskildsen (2011), Theódórsdóttir (2018), and others, to see how the medium of audio, video, or text exchanges affect the unfolding of word searches and other language processes such as corrective feedback. It may well be that the assigned roles in collaborative exchanges (i.e., native speaker and L2 learner) tend to render conversations more formal and predictable. Theódórsdóttir (2018) shows how the physical environment, the up-close give-and-take, and the body language of face-to-face participants may lead to a degree of personal and emotional investment that aids retention of new lexis. The dynamics online may lack the same degree of immediacy and emotional closeness.

Studies using CA also reveal another socially grounded aspect of lexis, namely the extent to which vocabulary selection reflects the phenomenon of *priming*, understood in this context to refer to the "recycling of a given construction offered by the interlocutor in the conversation and reused with different lexical items by the learner" (Ortega, 2015, p. 359). Such common reformulations, as well as the frequent presence of adjacency pairs as conversation framing, point to a principal tenet of usage-based linguistics, that language is both fixed and flexible at the same time (Crossley et al., 2016; Kramsch, 2002). CA-based analyses bring into view the central role played by local and social contexts in lexical choice, showing that language and language learning are situated in contextualized social interactions (Tyler & Ortega, 2018).

Insights from studies in informal language learning and socially-framed lexical development can inform classroom instruction as well (Eskildsen & Majlesi, 2018). Garner and Crossley (2018) found that the use of multiword units was greater in conversations between follow learners than between learners and native speakers. They tied this to findings that L2 speakers use more words in conversation with peers, leading to more comprehensible input from interlocutors, freeing up cognitive resources to use more advanced language features including n-grams (multiword units), possibly also resulting in greater emotional comfort and ease. That, in turn, may lead to a sense of freedom to experiment with novel expressions or to try out a word in different combinations. Here again, knowing more about the interactions of emotions and social contexts with language learning generally and with the learning and use of vocabulary specifically (especially lexical chunks) would be helpful. That could help find ways to maximize learning in setting up dyads and suggesting approaches to conducting conversations. Tanaka's (2017) study of vocabulary motivation is helpful in that regard. It found that motivated peers had little impact on others, but that in a group setting, demotivated peers had a decidedly negative impact.

Tanaka (2017) traced the demotivation in her instance to the predominate pedagogy of EFL instruction in Japan which she describes as emphasizing rote memorization. For many students, that method does not prove to be effective, resulting in a negative perception of their abilities and amotivation. According to Tanaka, students are unaware of other strategies for learning vocabulary. This, to my mind, points to a dual problem, namely using an inefficient and outmoded methodology and not helping students to become informed language learners. There is a case to be made for dedicated vocabulary learning in particular contexts, for example, because of time constraints or due to a short-term need for a particular lexicon (see Elgort, 2011; Nation, 2007). Yet, it seems to me, that even if this kind of explicit learning is emphasized in class, language teachers today have the responsibility to point to the availability and advantages of online services or apps for language learning (Godwin-Jones, 2015). Apps such as Anki offer sophisticated spaced repetition algorithms, stack synchronization across devices, rich mnemonic and multimedia integration, and optional gaming and competition features (see Nakata, 2011; Godwin-Jones, 2017a). Such services provide *meaningful elaboration* (Rousse-Malpat & Verspoor, 2018) or *rich learning* (Hu & Nassaji, 2016), as they offer multiple ways to encounter and practice lexical items. A recent study (Chukharev-Hudilainen & Klepikova, 2016) highlights the advantages of such programs and discusses limitations, including the absence of options for production of items in context and not taking into account word frequency in learning recommendations. I would add to that list the fact that item use in collocation or other fixed multiword expressions is not emphasized. In fact, the absence of contextualizing features is often a problematic aspect of dedicated vocabulary learning tools or services.

Conclusion and Outlook

There is evidence that learners are making significant use of lexical tools on mobile devices (Ma, 2017). In addition, there are many options to explore incidental learning through the availability of video streaming apps, podcasts, audiobooks, newscasts, fan sites, social media, and so forth, all available on mobile devices (Godwin-Jones, 2017c). Ma's (2017) recent case study of Hong Kong students' use of mobiles for learning English points to the rich collaborative and sharing activities in which students engage with their phones. Those actions on mobile devices included recommending new apps and strategies for language learning as well as suggesting specific English language videos. Several students reported using their phones to collaborate on English language projects. Clearly, mobile devices offer an idea vehicle for bridging the gap between school and life (Godwin-Jones, 2018b).

Given the widespread use of mobile devices for language learning (incidental and dedicated), Ma (2017) calls for app and software developers to create integrated apps that cater to typical learner needs and habits. The apps therefore need to be flexible and adaptive, so as to be useful to learners at different levels and with different backgrounds and needs (Chun, 2011). Specifically, Ma (2017) calls for tools that "make use of vast online language data, incorporate lexical concordances, and offer means for self-regulating language learning" (p. 18). Ideally, such a comprehensive app would allow for the incorporation of data from appropriate apps (assuming available open APIs). That might include preferences for online reading (or even automatic text queuing) as well as syncing with lexical tools. For logistical reasons and privacy concerns, incorporating informal learning experiences is difficult, at least automatically (see Godwin-Jones, 2017b). However, at a minimum, there should be an option to add data manually as well as to include a learning journal. Studies have shown that keeping a reflective journal has positive impacts on meta-cognitive awareness, self-regulation, and learner autonomy (Walters, 2015).

An example of a software approach that moves in the direction of integration and adaptability is the eCALL system (MacWhinney, 2015). It traces a variety of learner data including error and usage patterns. Tracking learner functions across different functions allows the system to provide suggestions, "For example, we may find that learners of Chinese spend 15 minutes with the Pinyin Tutor module and then shift to working with subtitled video for 45 minutes. We can track such patterns across days, and use these data to guide further construction of the system" (p. 28). The eCALL system experimentally supports informal language learning "using the computer as a backdrop for the promotion of actual interactions in the community" (p. 40). The author gives examples of learners of Icelandic recording interactions in Reykjavík over several months (Eskildsen & Theódórsdóttir, 2015); the interactions are then transcribed and loaded into a corpus. One could well envision such a system also accessible as a mobile app, with the option of speech recognition instantly providing preliminary transcripts of conversations. Such a system would be both adaptive and personal and could serve learners with a variety of learning needs and preferences who live and learn in many different contexts.

One of the strongest arguments in favor of an integrated approach to vocabulary learning is that the approach enables and encourages contextual learning. Elgort's (2017) review article about research on technology-mediated vocabulary learning points to the need for vocabulary research that examines fluency development (i.e., effective ways to link skills activities to learned vocabulary). This is needed so that learned constructions can be internalized and automatization of use can be enabled (see Kim et al., 2018). While that is something language teachers try to do in the classroom (mostly through elicited output), suggesting that students seek out online sources and resources is likely to increase substantially opportunities for practice and learning. Opportunities may come through participation in online social interactions in the L2, through individual reflective writing, or through teacher- and learner-created or commercial tools and exercises. Chukharev-Hudilainen and Klepikova (2016) describe a web-based program that generates contextual practice exercises which aim to deepen student's knowledge of targeted lexis online.

In most L2 learning contexts today, vocabulary learning is likely to be contextualized through both online

exposure and explicit instruction. The likelihood is that most learning will happen implicitly, but with "fine-tuning" through dedicated vocabulary learning "with the aid of top-down, conscious processing" (Tyler & Ortega, 2018, p. 318). That conscious processing by the learner ideally will be accompanied by an awareness of both learning strategies and online tools and services. Several studies have pointed out that for the current generation of learners, informed and personal choice in learning approaches is expected (Mercado, 2015; Philip, 2010). As language educators, we should encourage students to find ways to incorporate language learning into their everyday lives, using "an adaptive pedagogy that would situate language and culture as lived practice as a central organizing principle of foreign language study" (Dubreil & Thorne, 2017, p. 6). That includes connecting learning experiences in the classroom to those outside, both online and face-to-face (Kasper & Wagner, 2018).

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