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Understanding Vocabulary Learning and Teaching: Implications for Language Program Development

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Chapter 1
Semantic Development and L2 Vocabulary Teaching

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Introduction

From a psycholinguistic perspective, vocabulary learning involves three cognitive processes: (1) the establishment of a lexical entry in the learner's mental lexicon for a word; (2) the incorporation of accurate information about a word's form, meaning, and syntactic properties in the lexical entry; and (3) the development of the ability to access the lexical entry automatically. The first process enables a learner to recognize a visual or auditory input as a word, the second process allows a learner to use a word accurately and appropriately, and the third process lets a learner use a word efficiently in spontaneous communication.

From a pedagogical perspective, these also represent the tasks a teacher faces in vocabulary teaching in a second language (L2). A teacher has to help learners (1) create a working vocabulary that fits a student's need (i.e., help establish sufficient lexical entries) and (2) develop the ability to use the vocabularies accurately, appropriately, and automatically.

A central aspect of vocabulary learning is to understand the meanings of a word accurately. The importance of adequate semantic development is obvious, as one cannot use an L2 word accurately without an accurate understanding of its meaning. For example, a Chinese learner of English as a second language (ESL) will have difficulty in using the English words *hat* and *cap* accurately if he or she does not know how they differ semantically. However, research suggests that semantic development can be a long and slow process. Even many advanced learners may not understand the meanings of some high-frequency words accurately. Many factors such as learning strategies, L2 proficiency, form overlap, and cognate status may affect semantic development in L2 (e.g., Elgort & Warren, 2014; Hall, 2002; Laufer, 1990; Nassaji, 2003). In this chapter, I focus on the role of first language (L1) semantic structures in L2 semantic development. I begin with a discussion of the complex semantic relationships between languages, go on to review research on L2 semantic development with a particular attention to how L1–L2 semantic differences affect this development, and end with a discussion

of pedagogical strategies that may facilitate semantic development in classroom instruction.

Complex Semantic Relationship across Languages

Every language has a unique semantic system underlying its lexical system that reflects its linguistic and cultural heritage. Hence, when any two languages are considered, a complex picture of semantic overlap emerges. There are cases where the concept or meaning underlying a word in one language and its translation in another may be identical, particularly in the case of typologically or historically related languages. However, such complete overlap of meaning is usually an exception rather than a norm. Instead, a word in one language may have no counterpart in another, reflecting the presence of a lexicalized meaning that is unique to the former. A word in one language may differ significantly or subtly in meaning with its closest translation in another, or a semantic distinction may be made in one language but not in another. I outline five patterns of semantic overlap between languages from the perspective of an L2 learner before discussing the significance of such differences for vocabulary learning.

New meanings.

A meaning may be lexicalized in one language but not in another. This difference often reflects the linguistic and cultural heritages of a language. Numerous examples can be found in any language. The Chinese word *qing* refers to a color that lies between blue and green, but the color may not be lexicalized in other languages. The Chinese verb *chao* denotes a method of preparing Chinese dishes such as *chow mein* (*chow* = *chao*; *mein* = *noodle*). This does not have an English counterpart, so Yuen Ren Chao had to create the English compound *stir-fry* for his wife, Buwei Yang Chao, when she was writing her book *How to Cook and Eat in Chinese* (Yang Chao, 1945). There are many such meanings lexicalized in Chinese but not in English, such as *yuebing* (moon cake), *yaoguai* (monster-like creatures), *jianghu* (sometimes used to refer to a fictional community of kung fu warriors such as depicted in the movie *Crouching Tiger*). On the flip side, the meanings of humor, logic, and romance were not lexicalized in Chinese until they were borrowed as loanwords into Chinese as *youmo*, *luoji*, and *langman*, respectively. (The first of these was coined by the Chinese writer Yutang Lin in 1924.) Likewise, English words such as *fun*, *smirk*, and *fancy* do not find ready translations in many other languages. All these examples illustrate unique lexicalized meanings in a language.

From an L2 learner's perspective, this means the presence of L2 words that do not have a direct translation in the learner's L1. Vocabulary learning under such circumstances entails the learning of a new meaning or concept.

New distinctions.

A semantic distinction may be made in one language but not in another. For example, the two English nouns *criterion* and *standard* are usually translated into *biaozhun* in Chinese, representing a semantic distinction made in English but not in Chinese. More examples include English pairs such as *problem*/*question*, *suspect*/*doubt*, *real*/*true*, *begin*/*start*. On the flip side, some semantic distinctions are made in Chinese but not in English, as seen in pairs of Chinese words that are usually translated into a single English word, such as *zhichi*/*zhicheng* (*support*), *sunhai*/*sunhuai* (*damage*), and *shushu*/*jiujiu* (*uncle*). The first two of these examples illustrate the abstract/concrete distinction made in Chinese but not in English, such that the first member of the pair refers to an abstract meaning (such as support one's decision or damage a relationship) and the second member to a concrete meaning (such as support a falling wall or damage a piece of furniture). The last example illustrates a distinction made in the very complicated Chinese kinship term system with the former referring to one's father's brother and the latter to one's mother's brother. Similar examples include Dutch word pair *zetten*/*leggen* (both meaning *put*), French word pair *balle*/*ballon* (both meaning *ball*), and the Spanish pair *rincón*/*esquina* (both meaning *corner*) for English speakers, and the English word pair *language*/*tongue* (both meaning *kieli* in Finnish), and *interfere*/*interrupt* (both meaning *lehafria* in Hebrew). A new distinction does not have to be always binary. For example, the English words *male* and *female* are used to refer to humans, animals, and plants, but there are three Chinese counterparts for each of them: *male* = *nan*, *xiong*, *gong*; *female* = *nü, ci, mu* because different words have to be used to describe human beings, animals, and plants in Chinese.

These examples illustrate cases where two or more meanings are differentiated in one language but not in another, at least at the lexicosemantic level. From a learner's perspective, such cases call for the development of new distinctions at both the lexical and semantic levels. Learning the forms of two new words, for example, *criterion* and *standard*, is relatively easy, but knowing how the two words differ in meaning can be very challenging.

Partial overlap or semantic crossovers.

Two or more meanings in one language may partially overlap with two or more meanings in another language such that they cover similar semantic space, but the space is carved differently in two languages. This can be best illustrated in object classification. Chinese tends to classify objects by function, while English does so by shape. Thus, the Chinese word *bi* refers to all instruments used to write, draw, or paint, including what is usually referred to as a brush in English, that is, brushes for painting. Both Chinese and English distinguish a bottle (*ping*) from a bucket (*tong*), but the same object, for example, the five-gallon water bottle, is often referred to as a bottle in English but as a *tong* (bucket) in Chinese. A further example of how the same set of containers were classified and named differently

in English, Spanish, and Chinese can be found in Malt, Sloman, Gennari, Shi, and Wang (1999) and Malt, Sloman, and Gennari (2003). Such partial overlaps also exist in other semantic domains. For example, the German words *auf*, *an*, and *über* seem to cover the same semantic space of six English expressions: *on*, *upon*, *onto*, *on top of*, *over*, and *above* (Ijaz, 1986).

Where some semantic crossovers exist, L2 learners have to restructure the semantic space of individual words so that it becomes consistent with that of native speakers (NS) of the target language.

Developed domain.

Languages may also differ in how well developed a semantic domain is. A well-developed semantic domain contains many subtle semantic distinctions. For example, there are a few dozen verbs in English that can express the basic meaning of human movement on foot, that is, walk, but they are differentiated in the manner of walking, such as *toddle* (child, unsteady steps), *limp* (foot hurt, unsteady steps), *trudge* (heavy steps), *march* (even steps), *shuffle* (sad), *swagger* (proud), *hasten* (fast), *edge* (slow), and *wander* (without aim). Thus, semantic distinctions are made on the basis of step, attitude, speed, and aim in English. Still finer distinctions may exist among *wander*, *stroll*, *saunter*, *roam*, *amble*, and *ramble* as a set and *waddle*, *hobble*, *toddle*, *stumble*, *falter*, *limp*, and *stagger* as another even when they share the meaning of aimless walking and unsteady steps, respectively. In Chinese, all these would be translated into a single verb *zou*. The manner of movement has to be indicated by an adverbial phrase. On the flip side, for the meaning of hold or carry, which is a less developed semantic domain in English, Chinese has more than ten verbs that are differentiated based on which part of the body is involved in holding or the positional relationship between the object and the body, for example, *tuo* (palm), *ding* (head), *bao* (both hands), *na* (one hand), *kang* (shoulder, over), kua (shoulder, under), *bei* (back).

From an L2 learner's perspective, semantic development under such circumstances involves the development of a rich network of related meanings that are differentiated and lexicalized in a way not instantiated in the L1.

Idiosyncratic differences.

When the basic meanings are shared between a translation pair, sometimes certain peculiar difference may exist along a semantic dimension. For example, the Chinese word *huiyi* can be best translated as *meeting* in English, and *kaihui* as *have a meeting*. However, a meeting can take place between two people in English, but it takes three or more people to *kaihui*: two people have a talk, not a meeting, in Chinese. For another example, the English word *leader* is often translated into *lingdao* in Chinese, but *lingdao* always refers to a person who leads, thus with a semantic feature of [+HUMAN]. A leader in English can be a mother duck followed by her ducklings or a section of a fishing line that connects

the hook or lure with the main line. The most interesting example I can find is the Chinese word *shafa*, which is a direct borrowing from *sofa* in English. While *sofa* usually refers to an upholstered seating for two or more people (otherwise it is a chair), the Chinese *shafa* includes an upholstered seat for one person as well, so the meaning of [+MULTIPLE PROPLE] is lost. Because of the high degree of semantic overlap between members of such translation pairs, these peculiar differences often go unnoticed.

These differences are not always arbitrary in that they reflect the linguistic and sociolinguistic characteristics of individual languages. For example, the broader meaning of the word *leader* is related to the fact that it is a derivation from the verb *lead*, which has a very broad meaning (e.g., 24 senses listed at dictionary.com). Its Chinese translation is a verb–verb compound whose component verbs usually take a human as its agent. At the same time, these semantic differences are idiosyncratic in the sense that they occur at an unexpected semantic conjuncture from a learner's perspective or are often difficult to be described systematically.

While by no means exhaustive, these five patterns represent a majority of semantic relationships between two languages at the lexical level that an L2 learner faces in learning L2 words. With such differences in mind, semantic development refers to the process whereby a learner's semantic representation for an L2 word increasingly approximates that of NS of the target language, which is necessary for effective communication with NS. This may mean the development of a new concept or meaning, the learning of a new distinction, the remapping of the semantic space, or the fine adjustment of the specific semantic features associated with a word.

Evidence for and Causes of Slow Semantic Development

Even though semantic development has received relatively less attention in second language acquisition (SLA) research in comparison to the acquisition of other aspects of language, there is already quite consistent evidence showing that semantic development can be a slow and long process in adult L2 learning.

One line of evidence is the lexical errors L2 speakers make. Such errors are common in L2 performance in both classroom and experimental settings. In the former case, a Finnish speaker was found to use *language* instead of *tongue* in saying *He bit himself in the language* (Ringbom, 1983); Hebrew speakers were found to confuse between *interrupt* and *interfere* (Olshtain & Cohen, 1989); and Arabic speakers would use the word *oven* where *bakery* was appropriate, for example, *I go to the oven in the morning to buy bread* (Zughoul, 1991). All such errors have a semantic basis, as they involved a semantic distinction made in English but not in the learner's native language.

In one of the earliest experimental studies that was designed to specifically examine semantic development, Ijas (1986) explored the learning of six English expressions *on*, *upon*, *onto*, *on top of*, *over*, and *above* by German and Urdu ESL speakers. These latter languages do not make similar semantic distinctions as English does, such as the +/–movement distinction between *on* and *onto* or the +/– contact distinction between *on* and *over*. In a sentence completion task where the participants were asked to choose one of the six English words to complete a sentence, the ESL participants were found to have quite some difficulties in choosing the right word. For example, Urdu ESL speakers had considerable difficulty in differentiating *on* and *over*. The author attributed such non-native-like performance to the fact that such distinctions were not made in the participants' L1 and concluded that "native language conceptual patterns appear to be powerful determinants of the meaning ascribed to L2 words and they seem to be very rigid and difficult to permeate" (p. 447).

In two studies that employed a similar sentence completion task, NS of English and Chinese ESL speakers were asked to fill in the blank in a sentence by choosing between two English words that shared the same Chinese translation, such as *doubt* and *suspect* and *standard* and *criterion*. Two ESL speaker groups were tested: (1) those who were studying at an American university at the time of testing (Jiang, 2004a) and (2) those who had graduated from their graduate programs in the United States and were working as either professors or corporate employees (Jiang, 2007). The average length of residence in the United States was 2.7 and 10.5 years, respectively, for the two groups. The overall accuracy scores for the NS group and the two ESL groups were 94%, 65%, and 85%, respectively. The high accuracy shown by the English NS testified the validity of the test materials. The difference between the two ESL groups suggested that significant progress can be achieved with more experiences in the target language. At the same time, a statistically significant difference between the NS and the advanced ESL groups demonstrated that the development of native-like semantic structures, while achievable based on the trajectory shown in the data of the two ESL groups, takes a long time.

Another line of evidence can be found in the different patterns of performance between NS and L2 speakers where no error is involved. In Ijas (1986), for example, German ESL speakers considered *on* and *on top of* more closely related than English NS did. In Jiang (2002), Chinese ESL speakers considered two English words that shared the same Chinese translation to be more related in meaning than pairs that did not share the same translation, while English NS showed no difference on the same set of stimuli. In a study reported by Malt and Sloman (2003), NS and L2 speakers were compared in two tasks—object classification and object naming—involving two sets of objects: bottles and dishes. The results revealed considerable differences between L2 speakers and NS. Even the most experienced L2 group was significantly deviant from NS in their naming patterns for both sets of objects, and in their typicality rating scores for five of the

six categories. A further example of non-native-like performance can be found in a study reported by Saji and Imai (2013). They tested learners of Chinese as an L2 whose native language was Korean or Japanese. These latter two languages have fewer "hold/carry" verbs than Chinese does, which means that some semantic distinctions made in Chinese were absent in these languages in this particular domain. The participants in the study were asked to watch a set of video clips and then write down the most appropriate Chinese verb for describing each action. The results showed that in comparison to adult NS, the L2 speakers used significantly fewer verbs, and they tended to use more general verbs, and verbs that had a translation in their L1s. These results indicated that they had not developed a native-like semantic structure in the domain.

The third line of evidence comes from experimental studies that employed reaction time as primary data. In two studies, where advanced ESL speakers were asked to judge whether two English words were related in meaning, they were found to respond to English word pairs faster when they shared the same L1 translations than when they had different translations, while English NS showed no such difference (Jiang, 2002, 2004b). One explanation of this finding was that an L2-specific distinction, such as between *double* and *suspect*, was not learned among these learners. As a result, both words were mapped to the same L1 meaning, *huaiyi* in the case of Chinese ESL speakers. As a result, the two English words shared the same semantic content, which led the L2 speakers to respond to such pairs faster in the semantic judgment task. In a study reported by Elston-Güttler and Williams (2008), German ESL speakers were asked to decide whether an ending word was appropriate to complete a sentence. The critical stimuli included sentences such as *His shoes were uncomfortable due to a bubble.* The correct response should be "no." However, the ending word *bubble* shared the same German translation *Blase* with the English word *blister*, which was appropriate for this sentence. These researchers found that German ESL speakers took longer to reject such ending words than words that did not share a German translation with an appropriate word. This finding also suggested a lack of new L2 semantic distinctions among these participants.

Further evidence for slow semantic development with or without specific references to L1 influence can also be found in studies reported by Schmitt (1998), Haastrup and Henriksen (2000), Paribakht (2005), and Gullberg (2009).

The studies reviewed above consider semantic development under various semantic overlap patterns, such as new distinctions (Elston-Güttler & Williams, 2008; Jiang, 2002, 2004a, 2004b, 2007; Zughoul, 1991), partial overlaps (Ijas, 1986; Malt & Sloman, 2003), and developed domain (Saji & Imai, 2013). The results were quite consistent: semantic development is limited even among advanced L2 speakers, and many L2 word forms continue to be mapped to L1 meanings.

Before any pedagogical strategies can be discussed, it is important to understand why semantic development is slow even when plenty of L2 input is available. There are at least three reasons. The paramount reason is the presence of

an existing L1 semantic system. When an L2 word is first introduced to a learner, he or she is likely to understand its meaning within the existing semantic system. Regardless of the method used to convey the meaning, for example, by providing a translation, a picture, or a linguistic context, learners are more likely to find an existing meaning to be mapped with the new L2 lexical form rather than create a new meaning immediately. In this process, the learners may follow a semantic equivalence hypothesis, in Ijas' (1986) words, assuming that the meaning of an L2 word should be the same as that of its L1 translation. The initial mapping of L2 word form to L1 meaning has been widely recognized and documented (e.g., Blum & Levenston, 1978; Ellis, 1997; Giacobbe, 1992; Ringbom, 1983; Strick, 1980). It is the cornerstone of vocabulary acquisition models such as the parasitic model of vocabulary acquisition (Hall, 2002; Hall & Ecke, 2003; Ecke, 2015) and the psycholinguistic model of L2 lexical development of Jiang (2000).

Under such circumstances, semantic development does not only involve the learning of new meanings, but it also requires overcoming the initial form–meaning mappings or the modification of the existing semantic content to gradually approximate that of the target language. We may refer to this process as one of semantic restructuring. For example, an English-speaking learner of Chinese has to develop a new semantic distinction between concrete and abstract verbs while learning the Chinese words *zhichi* and *zhicheng*, both meaning support. Semantic restructuring also means adding a new semantic feature of [+HUMAN] while learning the Chinese word *lingdao*, thereby overcoming the initial mapping of the word to the meaning of the English word *leader* that does not have this feature. Thus, semantic development in adult L2 learning is essentially a process of semantic restructuring. As is the case with the learning of other aspects of language, for example, phonology, altering an existing mental representation may be more difficult than establishing a new one.

The second reason is the limited effectiveness of language input and experience for semantic restructuring under many circumstances. Language input may be a major driving force for the acquisition of syntactic knowledge (such as word order) and lexical knowledge (such as collocations) as it contains direct positive evidence for the target structures. It nevertheless is often less effective for semantic restructuring as it often lacks clear and powerful cues for indicating how an L2 word differs from its L1 translation in meaning or how two L2 words are semantically different. Because the basic meaning of an L2 word and its L1 translation is often the same, for example, the English word *bird* and its translation in another language, an L2 learner can use an L2 word successfully both receptively and productively by relying on the initial mapping to the L1 meaning. A Chinese ESL learner, for example, may become quite experienced and proficient in English without encountering any instance of this word being used to refer to a chicken, which is acceptable in English but not in Chinese (thus, the meaning of the Chinese translation of this word, *niao*, is semantically narrower).

Take the two English words *criterion* and *standard*, for another example. A Chinese ESL learner can successfully understand the meaning of both words within their existing semantic system, as the Chinese meaning of their shared translation *biaozhun* covers both meanings. It is difficult to imagine a linguistic context that would indicate how the two words differ in meaning or show that one word is appropriate and the other is not. As a final example, it took me more than 10 years of living in the United States to discover on my own that a meeting can take place between two people in the English context. All these examples illustrate cases in which L2 input does not contain powerful cues for L2 learners to discover L2-specific semantic structures. The limited usefulness of input or context for semantic development may be also seen in the low success rate for inferring word meaning based on context (e.g., Nassaji, 2003). Thus, increased L2 experiences do not automatically lead to semantic restructuring. Instead, they often reinforce the initial connection between L2 form and L1 meaning, which may be the reason why semantic development tends to fall far behind the development of other aspects of language among L2 speakers (e.g., Altenberg & Granger, 2001; Jiang, 2007).

Finally, semantic differences can be extremely complicated and subtle, which adds further difficulty to the daunting task of semantic restructuring. Take the pair *obvious* and *apparent*, for example. They may both refer to something that is easily perceivable and thus are semantically related, but they are not identical in that what is obvious is closer to being factual than what is apparent. This difference may lead English NS to prefer one over the other in some sentence context. For example, while developing test materials for a project, I asked 10 English NS to choose between the two words for a set of sentences. For the sentence, *there is also an _____ willingness, at least for now, to cross party lines to accomplish their goals*, seven of them preferred *apparent* over *obvious*, while the remaining three considered both words appropriate. However, under other circumstances, this difference may be less important so that the two words can be used interchangeably. This was reflected in the performance of the same 10 English NS for the sentence *despite his _____ affinity with his many beautiful subjects, Demarchelier claims not to understand women at all*. Three chose *obvious*, four chose *apparent*, and three accepted both as equally appropriate. To further complicate the matter, such semantic differences are often very difficult to articulate and explain for instructional purposes. For example, English NS intuitively know the differences between *criterion* and *standard*, but conveying the semantic differences to non-NS in a clear and convincing way is quite a different matter.

In sum, semantic development often involves altering the existing semantic structures so that L2 word forms become linked to L2-specific meanings. However, language input usually lacks clear and powerful cues to indicate how an L2 meaning is different from an L1 meaning or how two L2 words differ in meaning, particularly when semantic differences are very subtle. As a result, L2 experiences do not always automatically lead to successful semantic development.

Teacher Training and Pedagogical Considerations

Following this analysis, I want to propose that pedagogical intervention is particularly important for facilitating semantic restructuring and that the key to successful pedagogical intervention is to help learners see how the meanings between an L2 word and its L1 translation differ, or how the meanings of two L2 words differ. Knowledge of such differences, whether in an explicit or implicit form, will help trigger the process of semantic restructuring. The following discussion of pedagogical considerations is based on this premise.

Teachers' awareness and knowledge.

Successful semantic restructuring on the part of the learner begins with the awareness and knowledge of the semantic differences between a learner's L1 and the target language on the part of the teacher. A teacher should understand that it is quite common for a word and its translation to have subtle semantic differences. His or her knowledge of such differences between a learner's L1 and L2 is essential in facilitating semantic development through classroom explanation and material development. For example, such knowledge allows a teacher to anticipate where learners are likely to have difficulty and take pedagogical measures accordingly. Unfortunately, many L2 teachers do not know their learners' L1s or they face learners of mixed L1 backgrounds, particularly in an international setting such as ESL teaching in the United States. In this sense, these teachers are ill-equipped to help learners overcome the influence of their L1 semantic structures, which contributes to slow semantic restructuring.

However, even with little knowledge of a learner's L1, a meaning-conscious L2 teacher can develop a sense of how the two languages differ from the errors and inaccuracies in a learner's language use. When an English-speaker learner of Spanish uses *esquina* and *rincón* (both meaning *corner* in English) incorrectly and interchangeably, a Spanish teacher can make a reasonable guess that this pair may represent a new semantic distinction not present in English. The same is true if an ESL teacher finds a Russian ESL speaker to confuse between *scientist* and *scholar* (both sharing the Russian translation учёный). When a Chinese ESL speaker uses the word *brick* to refer to a tile in English or uses the word *pen* to refer to a painting brush, it is also reasonable to think that the two languages may differ in the classification of these objects with only partial overlap in meaning. A teacher's awareness of such semantic differences is the first step in any deliberate pedagogical intervention. This should be considered in teacher training and language program administration.

Explicit explanation.

Many semantic differences can be pointed out to learners explicitly if such knowledge is available on the part of the teacher. The differences between the Spanish words *esquina* and *rincón*, between the French words *balle* and *ballon*, and between

the English words *doubt* and *suspect*, and the difference between the English word *sofa* and its Chinese translation all illustrate examples of semantic differences that can be clearly and easily explained but may take years to be discovered by the learners on their own.

Admittedly, explicit knowledge about semantic differences obtained this way may take a long time to become integrated for automatic application in language use. However, such knowledge can be beneficial even before it becomes integrated. With conscious awareness of the semantic differences across and within languages on the part of the learner, additional encounters with an L2 word may help reinforce this knowledge rather than reinforce the initial mapping of L2 word forms with L1 meanings. Such knowledge may also guide a learner in paying attention to the linguistic cues in the input that are relevant to semantic differences that could have been ignored otherwise. This knowledge also allows learners to express themselves more accurately in L2 production. In short, compared to letting learners make their own discoveries, explicit knowledge may serve as a shortcut or as a cane for the learners to use while walking through the muddy water of meaning, thus speeding up the process of semantic restructuring.

Enhanced input.

However, many semantic differences cannot be described or articulated easily and clearly. Consider explaining the semantic differences between *criterion* and *standard* to some ESL speakers. An English native speaker usually intuitively knows they are different in meaning but may find it extremely difficult to explain the difference in a way that is helpful to an ESL speaker. Dictionary definitions do not usually provide sufficient information, either. For example, both *apparent* and *obvious* are defined as easily or readily seen in some dictionary. The definition of *true* being not false and *real* being not imaginary makes sense to a native speaker but is hardly useful for an L2 learner.

Where semantic differences evade description, a teacher may develop instructional materials that allow learners to make their own discovery implicitly through enhanced input. Enhanced input has been an important concept in instructed L2 learning (Sharwood Smith, 1991, 1993) both theoretically and practically. Drawing learners' attention to a specific linguistic feature or target structure by making the input salient has been shown to be effective in facilitating learning (e.g., Doughty, 1991; Jourdenais et al., 1995). By enhanced input, I mean materials that are developed to target a particular semantic difference or distinction. An ESL instructor, for example, can construct sentences for which only *criterion* or *standard* is appropriate for his or her students. With a sufficient number of such sentences that are used in an intensive manner, a learner may be able to develop his or her own feeling about the differences between the two words. A teacher may also use language corpora for developing such materials. For example, one may identify 20 sentences with *standards* and another 20 sentences with *criteria* from a corpus and use these sentences

(or revised versions of such sentences to reduce difficulty) as materials. There are at least three advantages of using such materials. First, they provide intensive input that may serve to accelerate a learner's exposure to a target word. Take the word *criterion* (or its more frequently used plural form *criteria*), for example. According to the Celex corpus, *criteria* has a frequency of 11 occurrences per million words. This means a learner has to read a million words worth of materials to encounter the word 11 times if one relies on natural input. Additionally, a learner's encounter with a target word in naturalistic language experience is most likely to occur in a dispersed fashion. In contrast, an instructor can provide 20 examples in a class meeting. Second, a learner's encounter with a target word is likely to occur without connection to its related word, *standards* in this example. Having sentences containing two semantically confusing words in the same learning context provides a favorable condition for learners to discover the semantic differences on their own. Third, as a semantic development session and with the purpose of these materials clearly explained, a teacher can focus the learners' attention on discovering the semantic differences between two target words. Under such circumstances, such input is more likely to lead to implicit learning of the semantic distinction involved than reinforce the initial form–meaning mapping. In short, the effectiveness of such enhanced input lies in its intensity, its contrastive nature, and in a clear semantic development focus or purpose associated with its use.

The use of L1 translations.

Many people believe that the use of the target language should be maximized and that the L1 use should be limited in L2 teaching, particularly in communicative language teaching (see Augustyn, 2013, Edstrom, 2006, Ford, 2009, Storch & Wigglesworth, 2003, and Turnbull & Arnett, 2002 for discussion). In vocabulary teaching, however, two things should be kept in mind while considering L1 use. First, as illustrated by the errors from Ecke (2015), Hall and Ecke (2003), Olshtain and Cohen (1989), Ringbom (1983), and Zughoul (1991), many L1 transfer errors occur at the semantic rather than lexical level. It is the incorrect understanding of the meaning, rather than the activation of its L1 word form, that leads to lexical inaccuracies, even though form confusion occurs (Laufer, 1989). Second, one is very unlikely to succeed in minimizing L1 influence by avoiding the use of L1 translations. When a new L2 word is first introduced, a learner is likely to understand its meaning within the existing L1 semantic system. For Chinese ESL learners, for example, the word *bird* will be mapped to the Chinese meaning of *niao* when its meaning is understood. Due to the strong link between semantic and lexical representations in a learner's mind, the Chinese translation *niao* will be activated as soon as the meaning is understood, even when a picture is used in conveying the meaning. A quick test can be done to demonstrate this. If I teach you the Chinese word *yanjin* by showing you this picture  and you understand the meaning of the word being glasses, I would predict its English translation *glasses* will appear in your head. Thus, regardless of whether an L1 translation is used in introducing an L2 word, it will be activated anyway.

Following this analysis, I want to suggest that there is no need to avoid L1 translations, particularly in the case of words whose meanings are difficult to convey by means of pictures, gestures, or actions. Where visual aids are less helpful, providing L1 translations offers a quick and unambiguous way of semanticization for the purpose of initial introduction to a word. Many others have made similar suggestions (e.g., Augustyn, 2013; Cook, 1999; Nation, 2003). Additionally, the L1 translation may also serve the role of an anchor for the new L2 word to be attached to the firm basis of the existing memory. This may explain why students often showed better vocabulary retention rates when L1 translations were involved (e.g., Grace, 1998; Laufer & Girsai, 2008; Zhao & Macaro, 2016. See Jiang, 2004b for more discussion).

What is important, though, is to follow up this initial introduction with ample language experiences and enhanced input to help learners (1) see the semantic difference between an L2 word and its L1 translation or between two L2 words, and (2) establish a direct connection between an L2 word and semantic or conceptual representations so that the activation of L1 translations may play a decreasing role in L2 use. Thus, from a teacher's perspective, the emphasis should not be on avoiding using L1 translations, but on providing sufficient and targeted language experiences to promote semantic development.

The timing of attention to meaning.

Several studies showed that attention to meaning at the initial stage of word introduction may inhibit the anchoring of the lexical form in the lexicon. These studies compared word learning outcomes for words that were introduced under two conditions: with or without attention to meaning. Attention to meaning was achieved in these studies by asking students to perform pleasantness rating (Barcroft, 2002), ask meaning-related questions about the new words (Barcroft, 2003) or generate synonyms (Barcroft, 2009), or by presenting new words in semantically related sets (e.g., Bolger & Zapata, 2011; Erten & Tekin, 2008; Finkbeiner & Nicol, 2003). Learning outcomes, as assessed in tasks such as free recall and translation, were usually worse in such conditions, as compared to conditions where no attention was given to meaning. Another study showed no advantage for semantic involvement at the initial stage (Khoii & Sharififar, 2013). This raises the issue of the timing of attention to meaning. It may be advantageous for learners to focus on registering a new word form in the memory (accompanied by a quick L1 translation or some visual aids for semanticization) at the initial stage of word learning, as dividing their attention between form and meaning may interfere with the establishment of the lexical form in the memory, as pointed out by Barcroft (2002). Semantic restructuring can be a target for subsequent learning experiences.

The use of language corpora.

Where explicit description is difficult, semantic differences can also be shown through how words are used. This is where language corpora become useful. They

provide information about the linguistic contexts in which a word frequently appears, for example, types of words they collocate with and the syntactic environments they appear in, which may provide clues about subtle semantic differences among a set of semantically related words.

A published study provides a good example to illustrate how corpus information can be used for this purpose. Liu (2010) examined the semantic differences among five semantically related English words: *chief*, *main*, *major*, *primary*, and *principal*. This study is highly relevant in the present context as these words often represent a new semantic distinction that is not present in another language. For example, they are often translated into a single word in Chinese, *zhuyao* (and potentially in other languages), and, as a result, are difficult for Chinese ESL speakers to distinguish. To understand the semantic structures of these words, Liu identified tokens of these words in the Corpus of Contemporary American English and examined (1) what types of nouns they are used to modify, (2) how often they are used to modify these nouns, and (3) in what syntactic structures they occur. Among the many findings from the study, the results showed that even though all these words share the basic meaning of being the first or the most important, they differ in the attributes they are more frequently associated with, for example, *principal* with the amount of work or contribution as in *principal investigator*, *chief* with rank or position as in *chief executive*, and *main* with concrete objects as in *main street*. It was also found that even though all five adjectives can be used to modify abstract nouns, the extent of importance seems to differ, with *main* being the most important followed by *primary*, *chief*, *principal*, *major* in descending importance. These words also differ in how often they are used in formal versus less formal contexts, with *primary* being the most formal followed by *principal*, *chief*, *major*, and *main* in that order. Such corpus-based analysis provides a rich array of information about often subtle semantic differences among words. More examples of such corpus-based studies of semantic distinctions can be found in Divjak's (2006) study of five Russian near-synonyms related to the meaning of intending, Divjak and Gries' (2006) study of nine Russian near-synonyms related to the meaning of trying, Gries' (2001) study of pairs of English adjectives ending with the suffixes *ic* and *ical* (e.g., economic and economical), Gries and Otani's (2010) study of two sets of English adjectives *big/great/large* and *little/small/tiny*.

It is comforting to know that individual teachers can also make use of such information without going for a full-fledged study. When an instructor is not clear about how two words differ in meaning, some information may be obtained by searching these words in a corpus and examining the linguistic contexts in which they appear (see Vyatkina, Chapter 7). Take the pair *real* and *true*, for example. A search in the British National Corpus showed that the word *real* goes with nouns such as *answer*, *difficulty*, *problem*, and *issue* in both their singular and plural forms much more frequently than the word *true*. In contrast, *true* goes with the noun *color* much more frequently than *real*. While this information

may not help reveal exactly how the two words differ semantically, it enhances a learner's performance in using these words correctly. Several corpora are available for free use online, such as the Corpus of Contemporary American English at http://corpus.byu.edu/coca/ and the British National Corpus at the Phrases in English site at http://phrasesinenglish.org/index.html. Such corpora and tools are also available in other languages, such as Spanish (http://www.corpusdelespanol.org/), Portuguese (http://www.corpusdoportugues.org/), French (https://www.sketchengine.co.uk/frtenten-corpus/; https://lextutor.ca/conc/fr/), German (http://www.sfs.uni-tuebingen.de/GermaNet/), Chinese (http://www.aihanyu.org/cncorpus/index.aspx), Japanese (http://www.kotonoha.gr.jp/shonagon/), and Korean (https://ithub.korean.go.kr/user/corpus/corpusSearchManager.do).

Conclusion

Semantic development is an essential part of vocabulary learning and teaching. L2 learners can use L2 words accurately only to the same extent that they understand the meaning of these words accurately. Because of the differences in semantic structures between a learner's L1 and L2, and because of the often inevitable involvement of a learner's L1 semantic system in L2 learning, semantic development requires the restructuring of a learner's existing semantic system. Semantic restructuring is dependent on a learner's discovery or (implicit or explicit) awareness of the semantic differences between the two languages or between two L2 words. However, due to a lack of clear and powerful cues in the language input for signifying such differences, semantic restructuring can be slow and difficult if learners are left to discover semantic differences on their own. Thus, pedagogical intervention is particularly important. However, in practice, the semantic component of vocabulary teaching is often neglected. Among the three elements of vocabulary teaching: form, meaning, and usage, meaning is often given the least attention. In some cases, meaning is neglected because conveying a word's meaning seems so easy. An L1 translation is all it takes for the teaching of meaning. Under other circumstances, meaning is neglected because explaining meaning is so difficult. Teachers are often not equipped for the task, and textbooks and reference books are often less than useful. By focusing on semantic development in discussing L2 vocabulary teaching, I hope to draw attention to this often-neglected aspect of vocabulary teaching, emphasize the importance of pedagogical intervention, and encourage teachers to find their own strategies for facilitating semantic development among learners.

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