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A Cognitive Linguistic Approach to Teaching Gerund and *To*-infinitive Complements

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In this paper, we apply the notions of embodied meaning and prototypes effects in cognitive linguistics to teach the English gerund and *to*-infinitive complementation to Korean high school learners of English in a typical classroom setting. In line with the conceptual approach to pedagogical grammar, we hypothesize that if learners are first presented with a systematic, meaning-motivated explanation for the L2-specific grammatical concepts, it will be easier for them to comprehend and produce the associated forms later. Thirty eight students selected through stratified random sampling according to levels of English proficiency are divided into two groups. In the experimental group, we employ schematic and exemplary visuals in order to help students map the conceptual distinction between the two complement types onto mental imagery before they are exposed to the linguistic forms, while in the traditional group the instruction is based on the forms followed by practice with a set of focus-on-form exercises. After two sessions of instruction, a post-test measures students' ability to use the correct form in a given situation. Results indicate that students in the experimental group have performed significantly better than those in the traditional group on almost all the test items.

**[cognitive linguistics/conceptual approach/gerund/*to*-infinitive/
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I. INTRODUCTION

One particular area of difficulty for second language (L2) learners of English is when to use a gerund or a *to*-infinitive form after verbs entailing a clausal complement. It is common practice to deal with students' errors like (1) in L2 classrooms.

(1) a. I practiced to play the piano.
b. I refused going there.
c. I avoided to make a friend.

Most dictionaries and grammar texts describe the contrast as formal selectional constraints — the verb *want* is followed by a *to*-infinitive complement while *avoid* is followed by a gerund, with a list of verbs being classified according to the two types of complement. This traditional description, dating back to structuralism in the early twentieth century, is not concerned with what might make the speaker choose one form over the other in a communicative situation. Moreover, verbs that may take either complement (e.g., *forget*, *prefer*) are generally treated as alternative options without a significant change in meaning. For example, Todeva's (1994) survey of 76 textbooks published since 1950 revealed that 70% of the books mentioned that in the case of verbs which could take either a gerund or an infinitive, the forms were interchangeable. Moreover, according to Celce-Murcia and Larsen-Freeman (1999), unlike English, most languages have *that*-clauses and infinitives, but no gerunds. When the learners' first language (L1) lacks the distinction of gerund and infinitive as in Korean, they might fail to notice the subtle difference in meaning between them. Celce-Murcia and Larsen-Freeman (1999) also mentioned that gerund complements are relatively rare in English: they occur less than 5% of the time while *that* and *to*-infinitive complements occur 46% and 45%, respectively. These all conspire to increase L2 learners' uncertainty about when to use which form, and so require them to learn the verb-complement pairings relying heavily on rote memorization.

In contrast to L1 acquisition, L2 learners start the L2 learning process with a fully constructed language, replete with language-specific labels for concepts, categories, and syntactic patterns. As Slobin (1993) notes, for the child, the construction of the grammar and the constructions of semantic/pragmatic concepts go hand-in-hand. However, for the adult, construction of the grammar often requires a revision of semantic/pragmatic concepts, along with what may well be a more difficult task of perceptual identification of the relevant morphological elements. Languages differ with respect to the ways in which they describe events. L2 concepts and categories may be in direct competition with those of the learners' L1, and these often represent different ways of construing the same reality

(e.g., Ellis & Cadierno, 2009; MacWhinney, 1987). Although we may not be consciously aware of it, our cognitive systems have been habituated by our L1; we have been trained in some ways to pay more attention to, or be more aware of those features of the external world that are explicitly encoded in our L1, and to be less aware of those that are not. Learning an L2 therefore means learning the language-specific concepts in the L2, and hence alternative ways of construing the same reality, which requires us to overcome the 'cognitive habits' (M. H. Choe, 2012; Hunt & Agnoli, 1991).

This implies that L2 acquisition involves not only the process of learning new expressive devices but also the process of reconstructing our ideas into L2-specific concepts that may emphasize different things from those that we use in our first language (Littlemore, 2009). The learners have, for example, temporal concepts such as past, present, or future. What they have to learn is that these concepts are expressed in different ways (e.g., adverbs, affixes, auxiliaries). The key idea of the concept-oriented approach is to focus on how the concept 'tense' must be expressed by a particular linguistic device. It assumes that "the structure of a conceptual domain, which is probably universal at the most abstract level, but language specific in its ramifications, provides criteria for the intake of linguistic form" (Robinson, 2013: p. 110). Conceptual categories drive attention and thus the learning process in a selective way. This leads to the point that grammatical rules are acquired on the basis of semantic triggers, extending over time to other instances that cannot be explained adequately by taking a form-based approach (Bardovi-Harlig, 2000; Dietrich, Klein & Noyau, 1995).

Over the past few decades, approaches to L2 teaching and learning have proliferated, among which are the audio-lingual approach, the functional-notional approach, the communicative approach, the task-based approach, and the sociocultural approach. Strikingly, however, the pedagogical grammar adopted by all these approaches is similar and has gone largely unchallenged. The generative view treats language as a system operating under its own rules and principles with a list of vocabulary items that plug into the rules. The consequence is the representation of syntax as having no meaning in its own right (Tyler, 2012). Language teaching that accompanies this view of language emphasizes the need for the learner to master the rules and exceptions. On the other hand, cognitive linguistics (CL) is an approach to language which sees linguistic expression and conceptualization to be mutually dependent, and interfaced with other cognitive and social systems in language use and language development (Robinson & Ellis, 2008). It takes the position that human cognition is a result of our species-specific neural-biological architecture and how we interact with the environment we inhabit (Gibbs, 2006). Thus, the structure of human cognition is fundamentally built by our experience with the world. For instance, drawing on 25 years of research in child development, Mandler (2004) provides evidence that the cognitive development of young children is crucially tied to their

embodied experiences with the surrounding environment, and that their embodied cognition in turn provides the conceptual foundation for basic syntactic structures. According to him, children begin to develop rudimentary concepts based on their interactions with entities and events in the world while reformatting the raw sensory data into perceptual memories (i.e., concepts) for mental manipulation and use as scaffolding for understanding further information.

With the rise of the communicative and task-based language teaching in popularity, there has been a shift in emphasis to implicit learning through rich input, negotiation for meaning, and pushed output (e.g., Doughty & Long, 2003; Robinson & Gilabert, 2007). Nevertheless, successful L2 learning requires a greater level of explicit awareness of L2 grammatical patterns, and so the teacher has to provide students with meaningful input alongside some explicit focus on form (de Bot, Lowie & Verspoor, 2005; Ellis & Cadierno, 2009; Lightbown & Spada, 2006; Norris & Ortega, 2000). CL suggests that the relationships between grammatical forms and their meanings can be made apparent in language teaching. This process encourages learners to explore the abstract meanings of grammatical forms, and to think about why the target language expresses things the way it does. According to Langacker (2008), the learning of grammar in this way involves grasping the semantic spin that the target language imposes, which is a far more natural and enjoyable process than sheer memorization. This leads to the inference that if L2 learners are first presented with a systematic, motivated explanation for linguistic concepts, it will be easier for them to comprehend and produce the associated forms later. In this article, we hypothesize that such a meaning-based grammar instruction could be more effective than form-based instruction. The key point of departure from the traditional instruction is the order in which form and meaning are presented; that is, in a CL approach to pedagogical grammar, L2 learners are expected to gain more when they develop the ability to notice the meaning of grammar first before they are exposed to the symbolic forms.

II. LITERATURE REVIEW

Since the CL approach assumes that the same cognitive processes which account for L1 acquisition will also account for L2 learning, it offers theoretical tools that potentially have direct applications for L2 teaching. Many areas of language which have traditionally been treated as idiomatic are viewed as more systematic, and thus amenable to instruction. Although many of the constructs in CL have yet to be examined empirically, researchers have begun to apply CL to language teaching. For example, Verspoor and Lowie (2003) show the effectiveness of teaching vocabulary using the concepts of prototypes and radial

categories. Apart from vocabulary, there have been relatively few concerted attempts to investigate the efficacy of applying CL to the teaching of L2 grammar. However, evidence is beginning to emerge that learners whose L2 appears to have fossilized can move towards more native-like competence when given CL-based instruction on recalcitrant forms, such as modal verbs and prepositions (Tyler, 2012). The purpose of this section is to introduce some key concepts of CL. We will focus on two theoretical constructs that are central to the research question investigated here: embodied meaning (through visual cues) and prototype effects.

As mentioned before, since CL views language as a reflection of general cognitive processes, all aspects of language are understood to be meaningful. Our experiences and conceptualizations are grounded in and filtered through our specific biological structures and our interaction with the world. This is what is meant by embodied meaning. One important aspect of embodied meaning is that sensory imagery, i.e., the mental representations of entities or events, are an essential part of human conceptualization. Once formed, the representations are retrieved from memory, not from immediate sensory stimulation (Kosslyn, 1980, 2006). Embodied cognition allows us to understand abstract concepts by relating them directly to our physical experience (Gibbs, 2006; Lakoff & Johnson, 1999). In other words, as the mind and the body are not separate, abstract concepts are experientially grounded. Therefore, "the semantic import of grammatical constructions constitutes the best insight into its formal structure" (Achard, 2008, p. 438).

Form-based instruction divorced from how a form is used as a meaningful choice is often not successful, even when the intervention is made as learners engage in meaningful tasks. For example, Liamkina (2008) revealed that when it comes to such grammatical features that advanced L2 learners often fail to master, even explicit focus-on-form intervention was not sufficient. Pointing out errors and providing a rule had very little effect. However, similar intervention in which the use of the form was presented in terms of a meaning-based choice did help learners use the form. These findings have important ramifications for L2 teaching — the theory of language learning teachers assume and the type of instruction embracing it actually make a difference.

Studies show that the use of gestural and visual support of meanings can be facilitative in L2 instruction (e.g., Condon & Kelly, 2002; Niemeier, 2008). Boers, Lindstromberg, Littlemore, Stengers, and Eyckmans (2008) report a series of experiments that investigated the effectiveness of combining visuals with verbal explanation in learning English idioms and metaphors. They found that L2 learners were better able to remember idioms when presented with a visual representation of the literal sense of the language than if they were given the L1 translation of the word. In one experiment, the participants completed a set of exercises for idioms. The experimental group received a verbal explanation about the etymological origins of the idiom as well as a picture illustrating the literal meaning of the idiom. The control group received the same verbal explanations but did not see the visuals.

On a fill-in-the-gap post-test, participants who saw the visuals outperformed those who did not. Similarly, Niemeier and Reif (2008) argued that for EFL learners acquiring the English tense and aspect system, it is crucial that semantic concepts be established before the introduction of morpho-syntactic forms to help learners develop a meaningful understanding of the system. Niemeier (2008) went on to create teaching materials for English progressive aspect, and found that students who were involved in a meaning-based activity achieved significant gains in their ability to use the target form.

Another key argument of CL is prototype effects — categories are organized around a central prototype (or central schematic representation) based on the essential attributes of the best examplars. Other entities which are perceived to resemble the prototype in some ways are part of the category but understood to be less good examples. So the periphery of the category may be fuzzy to the extent that some members could be considered as belonging to other categories as well. Verspoor and Lowie (2003) tested if multiple senses of words could be better taught in terms of radial categories with a core sense and related senses. They found that teaching the central meaning of a polysemous L2 word facilitated both initial learning and more accurate interpretation of unfamiliar extended meanings.

The prototype effects such as these have implications for the target grammar of the present study. Some verbs are very specific in their subcategorization with the majority of their tokens appearing in just one syntactic construction. Thus, the prototypical use of the construction is consonant with the frequency of the verb-complement pairing. The hypothesis is that learning the most typical use of the construction first is facilitative for the eventual induction of its distribution later. Ellis and Ferreira-Junior (2009) suggested that L2 learners as well as L1 children were sensitive to the co-occurrence of prototypical verbs in matching constructions, and so teaching the semantic matching between the central verb and its construction might facilitate use of the construction with a wider range of new examples akin to the verb.

The verb-complement matching is further complicated by the fact that while some verbs can occur with both types, other verbs occur with one or the other. Using the International Corpus of English, Gries and Wulff (2009) carried out an analysis of over 3,000 examples of these constructions to determine which verbs best distinguish between them. They found that many verbs have strong biases for one or the other construction. For instance, *need*, *offer*, *allow*, and *promise* tend to occur with *to*-infinitive complements, while *appreciate*, *enjoy*, *finish*, *mind*, *consider* and *avoid* tend to occur with gerund complements. Verbs such as *begin*, *start*, *like* and *prefer* occur about equally with both complements. According to them, the difference in meaning between *she tried rocking the baby* and *she tried to rock the baby* is subtle and often challenging for L2 learners. The gerund construction suggests completion whereas the *to*-infinitive construction suggests potential. In the former, the rocking was accomplished, even though the desired effect might not be achieved. In the latter, the potential for rocking was not yet realized. In many instances the two

complements also suggest two different temporal sequences between the main verb and the following complement. With gerund complements, the action in the main clause takes place after the action in the complement clause; with *to*-infinitive complements the action in the main clause takes place before the action in the complement clause, as the central meaning of *to* points to the future (Tyler, 2012, p. 83).

(2) a. I remember filling out the form.
b. I remembered to fill out the form.

In (2a), filling out the form took place before the remembering; in (2b), the speaker first remembers the need to perform the action and then carries out the action. Gries and Wulff (2009) undertook an experiment to determine if advanced learners of English had internalized this grammar. The findings suggest that instead of having learners memorize lists of verbs and their complement types, teaching the constructions with the most commonly occurring verb-complement patterns can facilitate learning the subtle meanings of the complements and lessen the initial learning load.

In sum, the key idea of the CL approach is that grammar should be presented as meaningful and motivated. The previous studies make it the case that learning is facilitated when the learner is provided with opportunities to make meaningful choices among competing language forms, choices that have to do with how native speakers of the target language normally construe the situation. Moreover, they shed light on the role of explicit instruction of linguistic features which L2 learners fail to master even after substantial amounts of exposure to the language. However, many of the arguments and theoretical constructs that would appear to have important implications for L2 pedagogy have yet to be proven empirically. This paper addresses the gap by presenting a quasi-experimental study that explores the potential of a CL approach to teaching the English gerund and *to*-infinitive complementation.

III. METHOD

1. Research Hypotheses

As outlined in section 2, cognitive linguistics takes the position that language learning involves the associative learning of linguistic constructions that reflect the probabilities of occurrence of form-function mappings. So language development gradually moves from an initial reliance on linguistic items that have occurred in the input to more abstract mental representations. Once the linguistic schema is in place, the learner begins to use the language more creatively. Ellis (2006a, 2006b) argues that in learning the appropriate

interpretation of form-meaning mappings, the L2 learner is guided by several factors such as contingency, cue competition, salience, interference, overshadowing, blocking and perceptual learning, all shaped by L1 entrenchment. The more reliable a form is, the easier it is to learn. However, most high-frequency units are highly polysemous. Thus, many linguistic cues which are highly available do not have high reliability, and it is these aspects of the L2 that are not easily acquired, and hence necessitate a greater level of explicit awareness and form-focused instruction. The majority of L2 teachers and researchers agree that in cases where the forms lack perceptual salience and thus are likely to go unnoticed by learners, or where the semantic/pragmatic concepts of the L2 forms are unfamiliar, focus-on-form instruction is needed in order for the learning process to be facilitated (e.g, Doughty & Long, 2003; Robinson, 1996; Schmidt, 2001).

Drawing on these, this study set out to examine whether CL would be more effective than traditional form-based methods in teaching one of the least salient features to Korean EFL learners. We made use of schematic and exemplary visuals in order to help students grasp the conceptual distinction between the gerund and *to*-infinitive complement before they learn the actual linguistic forms spelling the distinction out. That is, we tried to prompt students to engage in the process of conceptualization of the target notion and then to map the newly generated meanings to appropriate linguistic forms, instead of explaining the grammar by reference to form or letting them induce the rule out of input. It was hypothesized that presenting visual clues plus simulating cognitive involvement would provide a different learning condition from the one focused on form from the beginning. As a preliminary step, we selected two groups of students in a high school, gave each either cognitive or traditional instruction for the same period of time, and then compared their scores on a post-test.

2. Participants

A total of thirty eight high school students participated in this study. The school is coeducational, located in an urban area. The ratio of male to female students is about 4:6. Both male and female students study together in the classroom. The average level of academic achievement is upper intermediate. Participants were first-year students selected from two intact classrooms. For the present test, they were randomly divided into two groups: an experimental group and a control group. Both groups were equally composed of 19 students whose levels of English proficiency were compatible with each other. Their English proficiency was measured by their English level grades in the latest nationwide academic achievement test in November, 2012. See Table 1 for details.

TABLE 1
Participants: Levels of English Proficiency

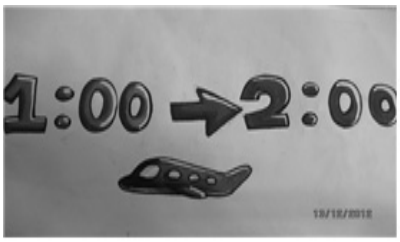
Levels	Number of Participants	
	Experimental Group	Control Group
1	4	4
2	5	5
3	5	5
5	3	3
6	1	1
7	1	1
Total	19	19

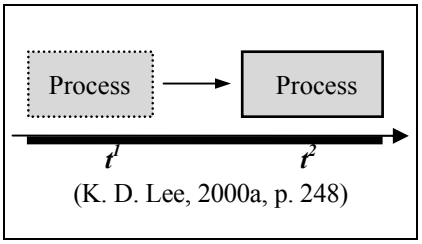
3. Materials

Along with the schematic diagrams in K. D. Lee (2000a, 2000b), 11 new pictures developed by the researchers were used (see appendix for the other visuals). The latter were designed to facilitate students' ability to distinguish the linguistic concepts under investigation as well as to motivate them to engage in classroom activities. The pictures represented real or hypothetical situations familiar to students. Teaching materials for three (out of total twelve) verb-complement pairings are presented below.

1) Delay

A verb *delay* indicates a process in which a subject starts or finishes an object later than expected, and the object may be an entity or event, which moves according to schedule. Figure 1 (Right) represents an event in a dotted box that should have happened at a time t^1 but did not, but it will happen at another time t^2 (K. D. Lee, 2000a, p. 248-249).





(K. D. Lee, 2000a, p. 248)

FIGURE 1 Central Meaning of *Delay*

As shown in Figure 1, the verb *delay* refers to a process which was supposed to happen at time 1 (t^1), but the subject delayed the process until time 2 (t^2). Consider the following examples of *delay*:

(3) a. Don't delay answering the letter.
b. He delayed publishing the report.

In Figure 1 (Left), the event was supposed to occur at one o'clock but it was delayed until two o'clock instead.

2) Promise

The verb *promise* represents a process in which an agent agrees to do a future action.

(4) a. He promised not to be late.
b. He promised not to see her again.

For instance, in (4a), the subject *he* promises to do what the other person does not want him to do (*not to be late*), as illustrated in Figure 2.

FIGURE 2 Central Meaning of *Promise*

3) Stop

The verb *stop* refers to a situation wherein the subject stops in order to do something or stops what he/she has been doing until the reference time (K. D. Lee, 2000b, p. 835).

(5) a. We stopped to help an old woman.
b. He stopped smoking.

In sentence (5a), the phrase *to help an old woman* is a propositional adverbial. On the other hand, *smoking* in (5b) is the object of the verb. We use exemplary visuals to represent the meanings, as shown in Figure 3.

FIGURE 3 Central Meaning of *stop to V* / *stop V-ing*

4. Procedure

Since the two groups were homogeneous regarding their general English proficiency in the beginning, there was no practical need for a pre-test. A total of 10 questions were developed to measure students' learning of the target grammar after two sessions of instructional intervention. The target verbs were of two kinds: verbs which take one of the two types of verbal complement such as *admit* and *want*, and those which can take either *to*-infinitive or gerund depending on the context such as *try* and *stop*. After the second instruction, students were asked to answer the questionnaire as a formative test, and their scores were used for group comparisons.

In the first instruction, the experimental group was presented with pictures designed to help them comprehend the prototypical meaning of gerund and *to*-infinitive complements. After that, they were exposed to actual verbs and practiced identifying which verb takes which type of complement. Finally, they were asked to figure out the meaning of verbs in authentic examples and performed the post-test. On the other hand, the control group was exposed to the target verbs first and then practiced distinguishing verbs with respect to

whether they take a gerund or a *to*-infinitive as their complement. After they were presented with example sentences, they performed the post-test in the same way as the experimental group did.

Participants were asked to try to think about possible meaning distinctions between the pictures. After completing the worksheet, the instructor led a discussion in which the correct answer for each target was given. During the second session of instruction, students were asked to solve ten questions by choosing the right form between gerunds and *to*-infinitives. All other conditions were equal except the instructional procedures. See Table 2 for a summary.

TABLE 2

Teaching Procedure

Session	Group	
	Experimental Group	Control Group
1	1. Teacher first presents realistic pictures followed by schematic diagrams. 2. Students are exposed to actual verbs and then practice identifying verbs which takes *to*-infinitive or gerund as their complement.	1. Students are exposed to the target verbs first and then practice identifying verbs which takes *to*-infinitive or gerund as their complement.
2	1. Students are asked to figure out the meaning of verbs in authentic examples. 2. Students perform the post-test.	1. Students are presented with actual example sentences. 2. Students perform the post-test.

Unlike the traditional pedagogy in which students are given L2 input including the target form and then distinguish which verbs accompany which complements, we assumed that it would be more motivating to have the learner fully acknowledge the meaning in question by means of concrete images and familiar concepts via L1 before they learn how to express the distinction in meaning using the target linguistic devices. In short, the purpose of learning and teaching was to raise students' conceptual sensitivity to verb categories in terms of (non-)finiteness of events rather than to comprehend the linguistic artifacts apart from preceding motivation and conceptualization for production.

IV. RESULTS AND DISCUSSION

The descriptive statistics with respect to persons and the results of independent samples *t*-test are presented in Table 3. Each participant's sums of correct responses to the post-test were used as data for analysis. The range of scores is from 0 to 100. The mean score of the experimental group (M = 87.37) is higher than that of the control group (M = 72.11), while the standard deviation of the former (SD = 13.27) is smaller than that of the latter (SD = 17.51). Considering the short-term treatment and small sample size, the mean difference (MD = 15.26) appears to be quite substantive. This is supported by the results of the *t*-test indicating that there is a statistically significant between-groups difference in students' intake of the target grammar: $t\,(36) = 3.029$, $p < .01$.

TABLE 3

Statistics for Persons of Independent Samples *T*-test

Group	N	Mean	SD	*t*	Sig.(*p*)
Experimental	19	87.37	13.27	3.029	.005
Control	19	72.11	17.51	3.029	.005

Meanwhile, sources of the within-group variance can vary; it might be due to students' individual differences, their attitudes and attentiveness toward the instruction, or some other uncontrolled variables. Importantly, alth ough the analysis with respect to persons shows that the two groups' average performance on the test is different, it does not inform whether their responses to each test item differ substantially, so that the mean difference well represents the effectiveness of the CL approach over the control one across all the items rather than being caused by only a small number of certain biased items. In order to determine if this is the case, the number of correct responses from each group with respect to 10 test items was used for statistical analysis. This time, the range of the dependent measure was from 0 to 19 (the number of participants in each group), and since an item was repeatedly measured by two groups, a paired samples *t*-test was applied.

TABLE 4
Statistics for 10 Test Items

Group	N	Mean	SD	*t*	Sig.(*p*)
Experimental	10	16.60	2.41	2.824	.020
Control	10	13.70	4.06	2.824	.020

Results show that the mean number of participants in the experimental group who were able to use the *to*-infinitive and gerund complement in appropriate contexts (M = 16.60) is more than that in the control group (M = 13.70). Moreover, the standard deviation within the former group (SD = 2.41) is lower than that of the latter (SD = 4.06), which suggests that the CL approach has an effect on a wider range of students than does the traditional form-based instruction, consequently narrowing the gap between high and low level students. This inference is supported by the *t*-test: $t(9) = 2.824$; $p < .05$. In sum, it can be said that on average, students in the experimental group performed significantly better than those in the control group across the majority of the test items.

In the light of the foregoing, it is worth looking at students' responses to each item in more detail. Figure 4 displays the total number of correct cases (i.e., participants) with respect to individual verbs in the post-test, so as to identify where exactly the difference between the two groups lies.

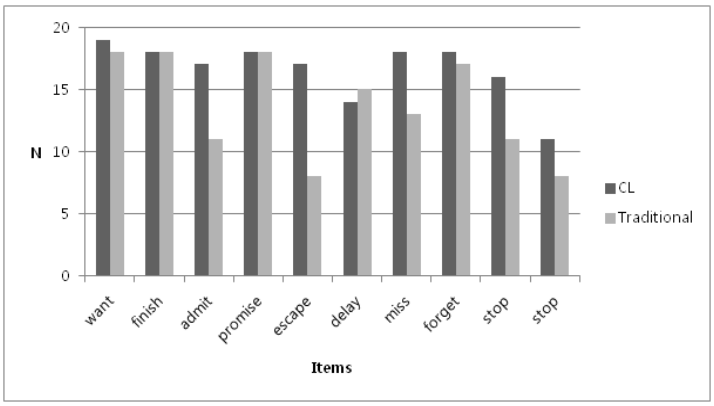


FIGURE 4 Results by Items

In the CL group, more than 80% of the students (over 15 out of 19) were able to correctly use the target form in 8 out of 10 items, whereas those in the traditional group reached the degree of attainment only in 4 items: *want*, *finish*, *promise*, and *forget* — these four are the most frequent verbs used to illustrate the target grammar in EFL textbooks. It

is thus likely that many of the participants were aware of them from the beginning through their studies other than the researcher's intervention. Apart from the four, gains of the experimental group in comparison with the control group are particularly noticeable in four items: *admit*, *escape*, *miss* and *stop*. The first three all take a gerund complement while *stop* can take either one or the other. Since *admit*, *escape*, and *miss* are transparent in meaning in that they entail real or hypothetical completion of an action, it seems that students who were guided to undergo the process of conceptualization via the CL approach were more successful than those who were exposed to the forms first.

In order to observe students' ability to use the correct form in a given context as well as their grammatical knowledge, it was necessary to include verbs that are ambivalent in complement choice depending on the context in which they are used. In our test, *forget* and *stop* served the role. Note that there were two items using the verb *stop* (9 and 10), with both requiring students to choose *to*-infinitive complement instead of one for *to*-infinitive and the other for gerund. This was to take into account the fact that in simple two-alternative choice tests, students' guesswork might play a role in their answer choices, compromising the resulting data. We presumed that students would be unwilling to choose the same form twice on the same verb unless they were assured of their choice based on a firmly internalized understanding of the target grammar. As shown in the results, the experimental group outperformed the control group in both the two *stop* constructions while the difference was greater in the first one than in the second one. We re-examined the two items to see if the second one was more likely to induce the alternative reading, but they seemed equivalent in possible readings. Therefore, we speculate that the participants' relatively poor performance on the second *stop* is in part attributable to their test-taking strategies.

We have seen that the experimental group was advantageous for almost all the verbs in the questionnaire. One single deviant was *delay*, which thus deserves to be discussed in some detail. Recall that in the framework of CL, prototypes and radial categories constitute the basic theoretical constructs for describing the distribution of linguistic forms, i.e., grammar. In the sense of prototypicality, verbs whose semantic import pertains to completed action such as *admit* and *finish* fall near the central use of the gerund complement. The meaning is further extended to hypothetical situations in which the speaker mentally (not actually) simulates completion of an action, illustrated by *miss*. Though less prototypical, verbs of this type might as well represent the core meaning (or function) of the gerund. Unlike the three verbs above, *delay* is far peripheral in that the semantic import of its complement is not only hypothetical but also less suggestive of a completed action. This becomes more obvious when compared with *miss* as follows.

(6) a. He delayed publishing the report.
b. He delayed the process of publishing the report.
c. He delayed the completion of publishing the report.

(7) a. They missed being destroyed.
b. They missed the process of being destroyed.
c. They missed the completion of being destroyed.

While (6a) is inherently ambiguous between the readings (6b) and (6c), (7a) is clearly better paraphrased by (7c) than by (7b). In this regard, *delay* is the least central example of the gerund complement, resulting in relatively low attainment on the part of the experimental group. However, neither is *delay* closer to the prototype of the *to*-infinitive whose meaning implies the speaker's active orientation towards a goal. It seems that *delay* instantiates the extended meaning of gerund rather than *to*-infinitive because the intention of (6a) can be better captured by (8a) than by (8b).

(8) a. He delayed (the process of completing) publishing the report.
b. He delayed (his orientation towards) publishing the report.

The concept of radial categories in CL purports to describe phenomena such as these where the outer boundaries of two or more competing categories are not clear-cut. Of course, all this calls into question to what extent the prototype effects last.

V. CONCLUSION

The purpose of this study was to investigate the effectiveness of a CL-informed approach when teaching the English gerund and *to*-infinitive compliments to Korean high school students in the classroom. Students in the CL group not only outperformed the control group on the posttest but also were more motivated by the classroom activities. This demonstrates that the CL approach helps increase the likelihood of positive instructional effects.

Some of the limitations of this preliminary study ought to be mentioned. First, we observed that although students might be able to identify part of the meaning of a certain verb, they often came up with wrong answers due to their lack of understanding of its contextualized meaning. Second, data were gathered from a small sample of students with limited diversity in educational backgrounds, so further studies are necessary to

consolidate the present conclusion. Third, although the CL group was advantageous for the majority of the verbs in the questionnaire, the verb *delay* was an exception.

In CL, all linguistic units are in fact schematized representations of instantiating expressions, which vary at levels of abstraction. Therefore, grammatical forms such as gerunds and *to*-infinitives also have a conceptual basis grounded in physical experience. This suggests that providing the learner with sufficient exposure to the prototypical uses of a given form in the context of meaningful usage events is important. Perhaps the key challenge to applying CL to language teaching is creating teaching materials that exemplify the theoretical notions in ways that are accessible to both teachers and students. The present study represents a first step in this promising line of research by showing that a conceptual approach using CL-based materials and procedures can improve Korean students' ability to intake the grammatical aspects of the English language that are hardly acquired through the input alone.

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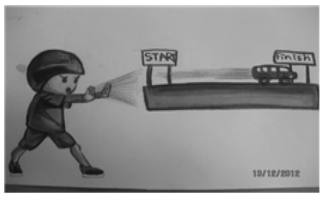
APPENDIX

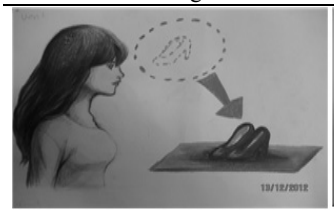
A List of Seven Other Pictures Developed and Used By the Researchers (I)

Central Meaning of *Admit*

Central Meaning of *Escape*



Central Meaning of *Finish*



Central Meaning of *Want*

Central Meaning of *Miss*

Central Meaning of *Forget V-ing*

Central Meaning of *forget to V*

Questions Items (II)

[Questions 1～10] Choose the right form between *to*-infinitives and gerunds.

1. She wants [to go / going] to Italy.
2. She has finished [knitting / to knit] the sweater.
3. They admitted [to steal / stealing] the goods.
4. Mom promised [to get / getting] me one of those cellular phones with a touch screen.
5. He narrowly escaped [being / to be] drowned.
6. He delayed [publishing / to publish] the report.
7. They missed [being / to be] destroyed.
8. Don't forget [turning / to turn] off the computer whey you leave.
9. We've been hiking for hours. Why don't we stop [taking / to take] a break?
10. On the return trip, we stopped [observing / to observe] a large black bear just off the trail.

Examples in: English
Applicable Languages: English
Applicable Levels: Secondary

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