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DISCUSSION

Verb Classes, Event Structure, and Second Language Learners' Knowledge of Semantics-Syntax Correspondences

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In this article I discuss some key points that are raised in the papers in this special issue. The first issue is that a variety of theoretical tools are necessary for a complete understanding of the issues raised in these papers. Second, although the methodology that is used in studies of second language knowledge has improved, it is clear we still lack an agreed-on set of protocols that will permit reliable comparisons across studies. In spite of these challenges, we are making progress in using complementary theories of the role of lexical representation, predication, and crosslinguistic variation to get a full picture of this complex area of lexico-morphosyntactic knowledge.

This special issue of *SSLA* is an important contribution to a significant and rapidly developing area of SLA research: knowledge of predictable links between a verb's semantics and its morphosyntax. In the first section of this commentary, I address issues that arise from the theories that these papers are based on. I then comment on methodology and conclude with some thoughts on future directions for this kind of research.

First, it is helpful to situate this research in the broader context of SLA re-

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search. Its significance is that it stands at the intersection of research on vocabulary learning and knowledge of morphosyntax. Much vocabulary learning involves learning arbitrary sound-meaning correspondences and therefore relies on exposure, on noticing, and on memory (see the special issue of *SSLA*, Vol. 21, June 1999, for papers on these topics). However, the field as a whole has not been sufficiently focused on aspects of knowledge of vocabulary that are less idiosyncratic, in particular, on crosslinguistic differences in the way a verb's meaning determines clause structure and the relationship between verb meaning and derivational morphology.

The fact that a verb imposes restrictions on the type of clause that it can participate in was the focus of a great deal of research in formal approaches to linguistics in the 1960s (see Newmeyer, 1980, for a review). Since the 1990s, there has been renewed interest in this topic; hence, in the next section I concentrate on some recent proposals in this domain and the implications that these proposals have in SLA.

SLA AND THEORIES OF THE RELATIONSHIP BETWEEN A VERB'S SEMANTICS AND ITS SYNTAX

Second language acquisition researchers have so far concentrated mostly on theories of argument structure that assign a key role to a fixed lexical semantic representation. Most of these theories are based on Pinker (1989) as well as theoretical contributions by Hale and Keyser (1993) and Levin and Rappaport-Hovav (1995). From this research, the possibility of classifying verbs into groups that have a similar meaning and therefore similar syntactic restrictions is well known. Hence, some researchers seek to develop an account that can successfully predict the morphosyntactic requirements of a verb based on a theory of semantic representation. Such a theory must also restrict the hypothesis space enough to make learning possible (e.g., Gleitman, 1990; Pinker, 1989). These theories are what Montrul (this issue) calls "the lexical determinism approach." For example, Pinker (1989) suggested that the potential for a locative verb to take a Theme object depends on it having the lexical decomposition in (1) [GO[PATH]], whereas a locative verb with a Goal object requires it to have the representation in (2) [GO[STATE]].

(1) a. *Chris poured the water*$_{\text{THEME}}$ *into the glass*$_{\text{GOAL}}$.
([X ACT + effect) [Y GO [PATH]]] = Theme must be direct object.
b. **Chris poured the glass with water.*

(2) a. **John filled the water into the glass.*
b. *John filled the glass*$_{\text{GOAL}}$ *with water*$_{\text{THEME}}$.
[X ACT + effect [Y GO [STATE]]] = Goal must be direct object.

In contrast, other theoreticians maintain that such a theory of lexical semantics and linking is not a complete account. For example, Tenny (1994) and Rosen (1996) accepted that a decompositional theory of semantic structure is

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necessary; however, they did not assume that semantic structures alone are sufficient to explain mapping into syntax. Rather, they claimed that the syntactic privileges of verbs are variable and that verbs cannot therefore be assigned rigidly to a single class that will predict their syntax. Instead, they believe that a separate theory—event structure—determines where the arguments of a verb are projected in the syntax. Rosen posited three event roles that are related to the "universal mapping principles" given in (3).

(3) a. An argument that is a Causer maps to the external argument position.
b. An argument that can measure the event maps to the direct internal argument position.
c. An argument that can delimit the event maps to an internal argument position—direct if it measures the event, indirect if it does not.

To see how this theory works consider the examples in (4).

(4) a. *The children taped the pictures on the wall.*
b. **The children taped the wall with pictures.*
c. *The children taped up the wall with pictures.*
d. **The children taped up the pictures on the wall.*

Under the verb class theory, *tape* is a [GO[PATH]] verb and should disallow GOAL direct objects, as in (4b). According to Rosen (1996), this representation should rule out any sentence in which the Goal is a direct object. In the event structure theory, the particle *up*—which has event structure properties—changes the aspectual nature of the verb to one in which the Goal can measure the event (4c) but not the Theme (4d). Also, Rosen claimed that event structure can bypass the lexicon for special uses; hence, even *fill* can allow a Goal object when the Goal can measure out the event, as in well-known examples from cookbook instructions, for example, *Fill the mixture into the zucchini*.

The paper by Bley-Vroman and Joo addresses the issue of how Korean-speaking learners of English interpret events that are described by locative verbs. Although they do not directly address these two competing theories, they do focus on learners' knowledge of whether an NP can legitimately be a direct object. They concentrate on the fact that direct objects are often construed as completely affected by the action described by the locative verb: In a sentence such as *The farmer loaded the truck with hay*, for example, *the truck* is assumed to be full. They show that learners are able to determine that a direct object with such a verb is completely affected by the action. However, when the verb does not allow a goal object, even when the Goal may be completely affected, they are not able to reject such sentences. Pinker (1989) claimed that there are classes of verbs that do not permit goal objects. For example, *pour* will not allow a receptacle to be the direct object even if it ends up being full after the pouring event is complete (cf. **John poured the glass with water*). This is because *pour* contains a narrow feature "manner of mo-

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tion" in its lexical representation. Bley-Vroman and Joo point out that features do not work the same way in Korean as they do in English, and so L1 knowledge cannot make up for learners' lack of knowledge of the way features work in the L2. The authors argue that learners cannot acquire the narrow-range features of a verb in the L2, and that L2 acquisition is therefore fundamentally unlike L1 acquisition.

Although one cannot contest the evidence against knowledge of narrow-range features in their paper, there are two reasons not to rush to judgment on the overall capacity to learn new subtle properties of semantics-syntax correspondences based on the Bley-Vroman and Joo study. The first reason is that the event structure theory may be able to account for some of the wrong choices that the learners made. If it is true that learners can construe events in different ways, and that even English verbs can be unstable in their class membership as claimed by Rosen (1996), then further research is necessary to rule out any role of event structure and whether it can, in fact, override narrow-range features in a consistent way, as the example from the cookbook instructions suggests. The second reason is that narrow-range features have not been completely accepted even in studies of L1 acquisition (Ingham, 1992; Juffs, 1996; Naigles, 1991). It would seem rather important to look for real constraints on the hypothesis space at a deeper level to indicate whether mechanisms available in L1 acquisition are still directly available in L2 (e.g., the affectedness property of direct objects that the L2 learners do in fact demonstrate knowledge of). As the authors point out, Korean locative verbs do not behave as their English counterparts do. Some deeper analysis of Korean semantic structure and morphology may enable researchers to determine precisely what the conflation properties of verbs in Korean are and how they may affect interpretation of English locatives.

I now turn to another class of verbs discussed in this special issue. Like locatives, intransitive verbs have received attention in both theoretical and acquisition studies. It has been generally accepted that intransitive verbs can be divided into two types: unergative verbs like *walk*, *run*, or *dance* that take a single Agent (external) argument and unaccusative verbs like *arrive* or *disappear* that take a single Theme (internal) argument. The theme argument is "promoted" to the grammatical function of Subject in multistratal theories of syntax. There are four papers in this issue that address issues of split intransitivity: Hirakawa, Montrul, Oshita, and Sorace and Shomura.

As with the locative verbs, lexical determinism and event structure make competing claims. Unergative verbs should only be able to take a cognate object, for example, *John danced a little dance*. These facts are illustrated in (5) (from Rosen, 1996):

(5) a. **Bill danced Sue.*
b. ??*The trainer jumped the horse.*
c. **Sue walked Bill.*

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The verb class theory accounts for these data by claiming that an unergative verb is just an "Act" event, hence it has one external argument only, which is projected to the Subject position only in English. In the event structure theory, these verbs are designated as atelic, which means that the event described by the verb does not have an inherent terminal endpoint and that it cannot therefore be causative. (See Van Valin & La Polla, 1997, for a recent and very accessible treatment of verb classes from an *Aktionsart* perspective.) However, as the examples in (6) show, some verbs can in fact take a noncognate object.

(6) a. *Bill danced Sue across the room.*
b. *The trainer jumped the horse over the fence.*
c. *Bill walked Sue home.*

In the verb class account, some verbs are said to be able to switch classes and become transitive verbs. The event structure account states that Goal phrases, underlined in (6), delimit the event. Hence, the event becomes telic, and the verb phrase meets the requirements of causative formation. Causatives are always delimited events in event structure theory.

These are structures that Montrul deals with directly in her paper. Montrul's paper is a significant advance because she is beginning to address the interaction of theories of static lexical representation with theories that include the aspectual properties of the whole predicate phrase (verb plus the internal arguments or prepositional modifiers) in an account of L2 knowledge of semantics-syntax correspondences. Spanish does not allow a PP to license an extra argument at all, so the equivalent of the sentences in (5) and (6) are all ungrammatical. Montrul's results suggest that learners transfer restrictions in this domain from the L1 to the L2. In the case of Spanish-speaking L2 learners of English, this transfer leads to undergeneralizations. Montrul proposes that certain sets of constructions, which have event structure properties such as those illustrated in (6), may act as triggers to allow learners to overcome these L1-based undergeneralizations. Hence, specific constructions that are licensed by event structure interact with lexical representations in the acquisition process. In this way, these theories should be viewed as complementary rather than mutually exclusive.

Both of the papers by Hirakawa and Sorace and Shomura focus on split intransitivity, this time on the acquisition of Japanese as an L2. These papers are important for two reasons. First, it is vital for a general theory of SLA in this domain to include L2s other than English. Second, Sorace and Shomura are correct to say that it is crucial for the theory of split intransitivity to be validated in non-Indo-European languages. Indeed, it has been claimed that Japanese also exhibits the split between unergative verbs and unaccusative verbs. One of the syntactic tools that has been used to support this claim is the modifier *takusan* "many," which produces a different reading depending

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on whether the verb is unergative or unaccusative. In unergatives, the adverb modifies the predicate, hence *He laughed a lot*. In contrast, when used with an unaccusative, *takusan* modifies the NP, hence *A lot of people arrived*.

Results from both papers suggest that the participants in these studies show sensitivity to the modification requirements of *takusan* with these two verb classes. The finding that learners can achieve a rather subtle knowledge of Japanese, which is not clear from the input, suggests that learners can still deploy UG in their acquisition of semantics-syntax correspondences. Although these results do not directly contradict the Bley-Vroman and Joo results on narrow-range features, they do call into question their overall conclusion that new properties of an L2 that are not available in the L1 cannot be acquired in this domain.

The final theoretical point to be made in this section is that languages seem to vary to some extent in the way they encode meaning into a verb root and associated free and bound morphemes (e.g., Juffs, 1996; Talmy, 1985). Such differences can set learners up to make overgeneralization errors if their L1 allows a wider range of structures than the L2 (e.g., White, 1987). For example, Inagaki focuses on an interesting difference between Japanese and English in the way these languages combine movement verbs with "manner" meaning components and "direction" meaning components. Inagaki finds a pattern of L1 influence that will be familiar to L2 researchers. His study confirms that learners are guided in their acquisition of syntax-semantics correspondences in a constrained way but that overgeneralization errors are difficult to overcome.

To sum up, the lexical determinism approach and the event structure approach make complex but testable predictions concerning the constraints on mapping from the lexicon to the syntax. Specifically, constructions that may be licensed by event structure seem able to override some lexically determined restrictions on verb semantics-syntax correspondences. Future research will need to carefully tease apart these competing influences.

METHODOLOGICAL ISSUES

The papers in this issue all report on studies that are experimental—that is, they all seek to validate psychological claims based on careful analysis of performance data. Given this approach, some noise in the data is inevitable. However, it is important to reduce such noise to a minimum. In this context, I would like to focus on three issues in this section: native speaker controls, the scales used to record judgments, and databases of L2 production.

First, consider the results of the native speakers who act as comparison groups in Montrul's study on agentive verbs of manner of motion and in Sorace and Shomura's paper on Japanese unaccusatives. What is interesting about the results is that the native speakers undermine to some degree the theoretical claims that are being tested, or at least they call into question the syntactic tools that have been used to prove those theoretical claims. For in-

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stance, Montrul's English native speaker groups accepted forms in both (5) and (6), contrary to the predictions of both theories. Also, Sorace and Shomura were forced to abandon one experiment because the predicted difference between unergative and unaccusative in their ability to omit the nominative particle *ga* showed that native speakers and learners alike rejected the omission of the particle for all sentence types. Based on results like these, some scholars may argue that we may in fact be trying to assess knowledge representation among L2 learners prematurely because the theoretical literature has not yet reached consensus on the status of that knowledge in native speakers. Though this may seem reasonable, in fact it is clear that SLA researchers can contribute to the theoretical literature by conducting this empirical research. Although theoreticians have long argued that linguists' own intuitions need to be validated (Birdsong, 1989; see also Schütze, 1996, for a more recent historical account of this issue and suggestions about how methods may be improved), syntacticians have in fact failed to do this necessary empirical research. Without SLA studies of this kind, many of these theoretical claims are simply not going to be tested. As such, this research is one clear example of how the study of SLA can contribute to theory construction. However, it is necessary to ensure large enough native-speaker comparison groups and a uniform methodology before the results will receive attention in the theoretical literature.

The second issue relates to the methodology involving Likert scales. Research in semantics-syntax correspondences, including my own (Juffs, 1996), has used Likert scales to get at the intuitions of L2 learners. In this issue, Montrul, Inagaki, and Bley-Vroman and Joo used Likert scales, but Sorace and Shomura used another technique known as magnitude estimation. These different methodologies may pose problems for researchers who want to compare their results or for meta-analyses that combine data from different studies. In the two studies on Japanese as an L2 for instance, both of which used the *takusan* structure as a test, we cannot directly compare the results because Hirakawa used a truth value judgment test with pictures, whereas Sorace and Shomura used a magnitude estimation technique without pictures. It would greatly benefit the field if one method could be agreed on. It is also the case that a Likert scale which includes zero as a midpoint for "don't know" (as opposed to an all positive scale from 1–7 or 1–5) may confuse participants and result in data that do not really reflect a "don't know" response but rather a midpoint response. Researchers should also agree about the range they have on their Likert scale (e.g., Montrul and Juffs have used a seven-point scale, but Inagaki used a five-point scale). We owe it to ourselves as a community of researchers to agree on methods because only then will our work be replicable.

Third, most studies seem to require that learners match a sentence with a picture. It seems that some visual stimulus is in fact crucial for verbs that may involve predication alternatives, as in (5) and (6), and with Hirakawa's test of the effect of the suffix *te-iru* on unergative and unaccusative verbs. However, static pictures may not be enough. For example, Montrul finds that English-

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speaking learners of Spanish overgeneralize and accept both the unergative without a prepositional phrase and with a prepositional phrase. However, Spanish may be misleading for English-speaking learners to some extent because sentences like **El capitán marchó a los soldados* "The captain marched the soldiers" could be interpreted by English speakers as "The captain marched *to* the soldiers." The learners may be giving this interpretation even though the picture does not show the captain moving in the picture—he may have in fact already marched over to the soldiers and be standing still in the way the learners interpret the picture. Such ambiguity suggests that even a method that uses pictures may leave learners uncertain as to how to match sentences with events. Videos may be necessary to solve this problem. For example, Brinkman (1997) found videos especially useful in depicting events with end-states and continuing actions versus end-point actions.

Fourth, in his very interesting meta-analysis, Oshita makes the important point that databases of learner production are vital to the overall picture of learner errors with argument structure alternations. Oshita's paper is particularly strong in dealing with a large set of seemingly contradictory evidence; for example, the overpassivization of unaccusatives compared with both a large number of sentences where these verbs are used correctly and data that show a reluctance to accept correct forms. Researchers can sometimes overlook data that do not fit a particular theory, and this paper tackles the heterogeneity of the data very well indeed. Hence, it is vital to consult corpora of learner data, as well as corpora of data that serve as input to learners (e.g., Juffs, 1998), before we can get a full picture of what learners know and how they come to know it.

CONCLUSION

This special issue is a significant milestone in our as yet incomplete understanding of the representation of verb semantics and the nature of L2 learners' knowledge in this domain. The papers in this issue begin to draw together diverse strands of complementary theoretical research in generative lexical semantics, research on inherent lexical aspect (or *Aktionsart*), and in cognition. They contribute to theory construction by testing empirically claims in the literature that have not undergone such testing, and they show that L2 learners can exhibit subtle knowledge of semantics-syntax correspondences. Future work needs to continue in this vein to obtain increasingly subtle and sophisticated knowledge both of representation and acquisition patterns. The results will have significant implications for linguistic theory and for SLA theory. They may also have a significant impact on the way these issues are dealt with in pedagogical materials.

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