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Facilitating language learning

A generative perspective

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This paper discusses from a theoretical and conceptual perspective how generative linguistics can be useful to language teaching and learning. Proper interpretation of the generative theoretical underpinnings, as well as better understanding of the generative conceptions about language and linguistic competence, and of relevant research results can help us better appreciate what it takes to acquire competence in a language. Well-informed decisions can be made on effective language teaching methodologies and materials, thereby facilitating language learning and generating success for learners. Applications of relevant concepts and principles are demonstrated by concrete examples that can be incorporated into lesson designs for the instruction of Chinese to English speakers.

Keywords: generative grammar; language learning as learners' internalizing linguistic system

0. Introduction

Formal linguistics, generative grammar in particular, tends to be viewed as highly abstract with complex terminology and mechanisms, and often perceived as having made little contribution to language teaching, or simply not relevant to language learning. Indeed, the sentiment was explicitly spelled out in de Bot's forum piece in *Applied Linguistics* (2015). This paper is to show that, if we can see beyond the generative formalism and terminology, we will appreciate the insight of the theory and better understand the nature and results of generative theoretical research, which can lead us to better comprehend what it means to be a competent speaker of a particular language. The understanding will make it easier to identify practical implications for how language is learned and accordingly how language can be taught. I will first briefly summarize the issues regarding the role of generative theory in language teaching in Section 1 and then describe in Section 2 the generative conceptions of attaining linguistic competence. The perspective from generative

theory highlights two main aspects in language learning: learners need to truly learn the rule system of the target language and learners should be the center of the language learning process. Section 3 discusses the pedagogical challenges and solutions. Section 4 demonstrates with concrete examples how the concepts can be put to good use in language classrooms. Section 5 shows how theoretical linguistic research and Universal Grammar can help distinguish the areas that can benefit from explicit teaching of rules and those that will benefit more from implicit learning. This work lays out the claims and predictions through theoretical and conceptual reasoning, while leaving confirmation and/or revisions of the proposal to future experimental studies.

1. Generative theory and language teaching – issues

The role of generative linguistic theory in language teaching has not been favorably perceived by many researchers in the field of applied linguistics. To them, it seems that generative grammar only gives the field vague or futile concepts of Universal Grammar (UG) and parameter-setting – that human languages share some core properties or UG, and language differences are due to instantaneous “switch”-like parameter settings. Such is the sentiment represented in de Bot (2015), stating that “the UG movement did not deliver. Not in terms of a better understanding of what language is, nor how language development takes place, nor – crucially – how a language should be taught. After 40 years of research, it is still unclear what UG consists of, and the research has been limited to a few syntactic features, such as pro-drop phenomena.” (p. 262) In the generative research especially in the 80’s, there were multitudes of studies on what the pro-drop phenomena were and what the notion of parameter setting was (cf. Chomsky 1981, Rizzi 1982, Jaeggli and Safir 1989, among many others; see Klein and Martohardjono 1999 for instance, for some review). For instance, Rizzi and many others suggested some possible correlations: if a language was a pro-drop language, then it was a language with rich agreement, allowed null subjects, null expletives, postverbal subjects, and had no *that*-trace effect, etc. The earlier conception of the pro-drop parameter was that, when a learner understood that a particular language was a pro-drop language, then, the switch for pro-drop languages was on and the learner should be able to acquire the relevant properties without much learning (see, for instance, White 1985, 1989 and cf. a more recent 2003, among many others). The whole cluster of associated constructions would become part of the learner’s grammar. According to de Bot, in the generative linguistic research of second language learning, the focus was mainly about parameter-resetting, which was single-value changes affecting clusters of constructions. However, de

Bot notes that such conceptions of parameter-(re)setting have not proven themselves useful in language teaching.

Nevertheless, Slabakova et al. (2014) argued that negative perceptions about the usefulness of and contributions from generative researches to language teaching and learning had been due to misunderstandings of the generative grammar and the fact that some proposals, although tested and eventually discarded, continued to be cited as though they were still accepted and in active use. They emphasized that generative researchers had moved on. For instance, the notions of parametric clustering and instantaneous acquisition are no longer held by generative researchers. The current conception of parameter-setting is that second language acquisition (L2A) involves a two-step process of mapping and (re)assembly of formal feature matrices, according to the Feature Reassembly Hypothesis (Lardiere 2009). The first step is based on perceived similarities between the functional meanings of second language (L2) and first language (L1) lexical items (reminiscent of Contrastive Analysis). Similarities lead to an initial feature mapping of L1 items onto target items. For example, Spanish-speaking learners of English typically map the Spanish imperfect onto the English past progressive because they partially overlap in meaning. The next step involves feature reassembly: features can be added or deleted, gradually adjusted based on input-based evidence for meaning and usage. For the English progressive, noticing its unavailability with stative verbs and the absence of habitual interpretation should result in alterations to the feature set. Feature reassembly may occur slowly or not at all if the relevant evidence in the input is rare or ambiguous. Therefore, no instantaneous resetting of parameters is expected.

Slabakova et al. (2014) discussed three other misunderstandings about second language acquisition research in the framework of generative grammar. One of them concerns the role of input. It is not true that generative second language acquisition research disregards input. They cited, for instance, Montrul (2009), who argues that reduced input is a primary cause of the potential incomplete first language acquisition among heritage speakers. Taking into consideration the issue of input provides answers to why some heritage learners do not achieve native-like competence in their first (heritage) language, even though they should be able to, because they are childhood acquirers. Input is essential to the success of language acquisition. Indeed, input or “primary linguistic data” has always been recognized within the generative framework as crucial for attaining linguistic competence, including setting parameter values.¹ Chomsky (2005) re-emphasizes

1. The importance of input has been advocated by many others with different theoretical interests (see a recent one Ellis and Wulff 2014, among many others).

the importance of input in identifying three factors that determine the properties of the human language faculty: (i) the genetic endowment; (ii) linguistic experience (comprehensible input); and (iii) principles of data analysis and efficient computation. Learners need to frequently encounter mappings between form and meaning (O'Grady et al. 2009). Yang's (2002) Variational Learning Model specifically stresses that, although parameters constrain the hypothesis space of the child, parameters that are supported with abundant, unambiguous evidence in the input will be learned earlier than parameters for which the supporting evidence is scarce. In brief, the quantity and quality of input facilitate learners' mapping of form and meaning and attainment of linguistic competence.

Slabakova et al. (2015) further clarifies that the goal of the generative research on second language acquisition has been to determine what constitutes knowledge of language, how such knowledge is acquired, and how it is put to use in production and comprehension (Chomsky 1986; White 1989); it is not directly concerned with the applicability to teaching. Nonetheless, the findings of generative researchers often offer new, sometimes unexpected pedagogical insights and benefit teachers, curriculum designers, and textbook writers. In fact, there has been a substantial number of publications and conferences etc. focusing on the generative research on language learning and teaching (see Slabakova et al. 2015 for examples and details).

2. Fundamentals of generative linguistic theory

Clarifying misunderstandings about the generative grammar as Slabakova et al. did is very useful. Highlighting the generative conceptions regarding language and linguistic competence can also help teachers make well-informed decisions on teaching methodologies that facilitate language learning. In the following paragraphs, I briefly sketch the main generative conceptions and theoretical claims that would allow us to see more clearly possible applications.

For generative grammarians, language is a brain system of symbolic mental representations and rule-governed operations on those representations. The rule-governed system is 'internal' to its users the way cognitive faculties such as perception or reasoning are. The language faculty resides in the mind/brain. This individual-internal biological system generates (hence the term generative) the external expressions of the language. More specifically, language as a cognitive faculty is structured in the following way. It has a list of items, called Lexicon. In addition, it has a computational system – a generative procedure that generates structural descriptions – the expressions of language, each a complex of properties, including semantic and phonetic. The system includes invariant principles of

Universal Grammar, which account for uniformity among grammars of human languages, as well as parameters with different possible values, which account for variation among grammars. UG defines the commonalities among human languages. The system of rules for a language sets boundaries between what is possible and what is not possible in that language. Learning a language involves learning of Lexicon and a selection from a set of grammars the one that generates the strings of the language and does not generate the impossible ones. The selection does not always become part of the final-state grammar of the target language, as demonstrated by the existence of intermediate grammars (the system of rules for interlanguages). Learners form rules according to the constraints of Universal Grammar and the input they have received, then apply the rules to more contexts. Further data encountered by learners will inform them whether their earlier rules are adequate and the intermediate grammar will be either revised or confirmed. In other words, the establishment of a learner's grammar begins with a hypothesis constrained by Universal Grammar, affected by the existing grammar for L1, and the input. Then, learners have the opportunity to put the hypothesis to test. If supporting evidence is abundant and unambiguous, a hypothesis can be more easily confirmed and established as part of the system of the rules for the target language. If supporting evidence is scarce, it would be more difficult to confirm or revise the hypothesis, affecting rule formulation. A first language learner builds his/her grammar according to the primary linguistic data he/she encounters and Universal Grammar. A second language learner, with the L1 system in the mind, takes a two-step process of mapping and (re)assembly of formal feature matrices. Perceived similarities between the functional meanings of L2 and L1 lexical items lead to an initial feature mapping of L1 items onto target items. This is followed by reassembly of features – features added or deleted, gradually adjusted based on input-based evidence for meaning and usage.

Summing up, the learning procedure involves making hypotheses according to data illustrating form-meaning mappings (intermediate grammars), making and testing predictions, confirming/revising hypotheses, and so on. Through the series of hypothesis forming, testing, and confirmation/revision, a learner keeps developing his/her system of rules for the target language residing in the brain.

3. Pedagogical implications

What we have seen emerged from the generative conceptions and studies of human languages, linguistic competence, and language learning are the increasing attention to the quantity and quality of input (primary linguistic data) and the emphasis that learners need to have opportunities to properly map form and meaning and

establish the rules that generate all and only the sentences that are acceptable in the target language. The process is series of hypothesis making (constrained by UG, affected by L1 in the case of L2 learning, and built on input), testing, and revision or confirmation of the hypothesis.

3.1 The “what” of teaching

What do all these mean in second language learning, especially in the formal language instruction setting (classroom setting)? The issues we should consider include what to teach and how teaching/learning can be carried out more effectively.² Consider first the issue of what to teach. Recall that, according to generative grammar, UG and L1 are internal systems residing in each individual learner’s brain. The linguistic competence in a second language is built on UG as well as the learner’s competence in his/her first language; a second language learner has already internalized the L1 system as well as possessing the innate knowledge of the properties common to all human languages. The establishment and internalization of the system of rules begin with input and hypothesis-formation. What teachers can do at the start to increase the success of students’ language learning is to help them make the best possible initial hypothesis so that fewer further revisions would be needed. This amounts to saying that attention to form or the rules of the target language can be useful. Indeed, this is the conclusion of many experimental studies,

2. Slabakova et al. (2015) has a good number of examples showing that some items need to be taught but the explicit teaching of some others might be just a waste of time or even confusing. “For instance, Stringer (2013) shows that instruction on modifiers should be modified so that some aspects of the order of modifiers should be taught (adjectives of opinion come before those of age), whereas there is no need to teach others because they are universal (gradable vs. nongradable adjectives). In an intervention study, Hirakawa (2013) demonstrated the importance of explicit instruction for learners to overcome over-passivization errors (cases when learners passivize intransitive verbs as in *the earthquake was happened*). Reviewing how properties of Spanish object clitics are taught in Spanish language textbooks, Bruhn de Garavito (2013) shows that textbooks present too much information all at once and that the introduction of some distinctions is unnecessary and impedes successful learning. She also identifies properties that would benefit from later presentation, when learners are more advanced. Finally, Slabakova and White (2014) explain why pronouns, especially when they are not reduced in pronunciation, are difficult for language learners to interpret, thus identifying another area where instruction would be of benefit. The overarching idea is that classroom time is more efficiently spent if teachers do not teach what is universal and comes to the learners for free; instructors should focus on teaching properties that need a lot of input and practice to be fully acquired (Slabakova 2008). Teachers would be well served by being aware of these distinctions (Ringbom and Jarvis 2009; Rothman and VanPatten 2013; VanPatten and Rothman 2014).” (p. 266)

showing that learning of the form about a language is effective to learning some aspects of the language (see, for instance, the chapters in Whong, Gil and Marsden 2013, or a recent special issue of *Applied Linguistics* on Synthesizing Research on Form-Focused Instruction (Volume 36 Issue 3 July 2015)).

On the other hand, a second language learner should not have to learn those belonging to Universal Grammar and those generated by the same rules as in the first language (those with the same parameter values) as long as they are identified as such. Other parts that are new or different need to be learned, which include those with different parameter values and language-specific Lexicon. That is, differences should be made between the part that is language specific and the part that is universal, those common to L1 and L2, and those differing in L1 and L2.

That there are properties common to L1 and L2 is intuitively clear – two languages can exhibit identical properties in some aspects. Learners can make hypotheses according to their existing rule system without the need of further revision. Universal Grammar is also available to learners. What learners need is the availability of supporting evidence for certain properties and learning or acquisition of the properties can begin. Further note that the recognition of supporting evidence and the attainment of learning/acquisition are mental processes which mostly are not explicit to learners, as indicated by the fact that few speakers are able to describe in clear words what they know about their native languages despite having native competence. To illustrate, let's consider the learning of lexical items and their properties, such as categories or parts of speech. The notion of lexical category is a common property; but which category a lexical item belongs to is new information to learners in most cases and needs to be learned. Learning the category of a lexical item means learning the distribution of the lexical item – context where the lexical item occurs, such as the possible and impossible positions in sentences. In regard to this, one might note that in the overwhelming majority of textbooks and reference materials such as dictionaries and grammar books, lexical items are introduced with their categorial specifications, such as nouns, verbs, prepositions. Some teachers even try hard to explain to students what nouns, verbs and other parts of speech are. However, the notions regarding parts of speech are properties shared by human languages; they do not need to be learned or taught. In this sense, it is unnecessary for grammar books or teachers to introduce or teach the definitions of nouns or verbs or other parts of speech. It could be fruitless to try to define for students that nouns are names of objects and verbs are about activities or actions, etc. This recognition is important because it is generally not easy to adequately explain these categorial notions in a clear and easy-to-understand manner (there has always been a big gap between explicit knowledge that can be described in clear words and internal competence). The more explanations a teacher gives, the more confusing it might become. It would

be more straightforward to rely on language learners' implicit knowledge about parts of speech, realized as intuitions about what category appears in what context. Indeed, many studies in formal grammar have shown that the category of a lexical item is determined by context. For instance, a speaker can identify the parts of speech of made-up words without knowing their meanings (and without knowing the labels linguists give for the parts of speech). The famous *wug* test (Berko, 1958) is an example. We can position made-up words in a sentence like the one below and understand which lexical category each of the made-up words is without knowing the meanings:

- (1) The *wug* will be *wugged wugly*.

Even without the ability to explain explicitly what nouns, verbs, adverbs, etc. are, users can easily replace the italicized words with words of the same categories and properly inflect the words when relevant. In addition, a word oftentimes does not belong to a single lexical category. The part of speech for a lexical item is determined by where it occurs. This can be illustrated by some familiar words whose categories seem to be more easily identifiable, such as names of objects (commonly understood as nominal). Speakers can use such common words in different contexts and assign them different categories. For example, if one simply looks at English words such as *face*, *hand*, *table*, *chair*, *knife*, *fork*, *spoon*, he/she might say that these are clearly names of objects and they are nouns in category. However, they do not need to be nouns. Speakers know that if they are used in different contexts, their behavior would change accordingly. In (2a–b) below, speakers know what types of lexical items can occur after *the*, or occur in the object position, or appear with the plural marker *-s*. That is, they have the knowledge of lexical categories and their functions in sentences even though they might not explicitly use labels such as nouns to identify the lexical category. They can also use these words as verbs in appropriate contexts. Although, again, they do not necessarily have the ability to describe what they know in clear, explicit terms. The categorial properties of lexical items can be identified simply by their forms and positions in sentences.

- (2) a. I saw the *face/table/chair/knife/fork/spoon*...
 b. I saw *faces/tables/chairs/knives/forks/spoons*...
 (3) a. Let me *face/table/chair/knife/fork/spoon*...it.
 b. He *faced/tabled/chaired/knifed/forked/spooned*...it.

Chinese behaves alike. Following a common practice of using XX to represent unidentified words, we can have the following sentences and understand very well what category each XX is. That is, proficient speakers of Chinese know what words

can replace each XX, without having the explicit knowledge of the categorial labels used by linguists or teachers as indicated at the end of each example.

- (4) a. 我吃了 XX. – must be nominal
 wǒ chī-le XX.
 I eat-Asp
 ‘I ate XX.’
- b. 那是一个 XX. – must be nominal
 nà shì yīge XX.
 that is one-Classifier
 ‘That is a XX.’
- c. 我有两-XX 东西. – must be unit name for counting (classifier)
 wǒ yǒu liǎng-XX dōng xī
 I have two stuff
 ‘I have two (units) of stuff.’
- d. ta huì XX tamen. – must be verbal
 he will them
 ‘He will XX them.’
- e. ta XX-le tamen. – must be verbal
 he -Asp them
 ‘He has XX-ed them.’
- f. zhe shì yī-ben hěn XX de shū. – must be adjectival
 this is one-Cl very De book
 ‘This is a very XX book.’

In other words, learning to be able to talk about the labels of lexical categories such as nouns, verbs, adjectives, classifiers would not be as productive as learning how words are used in context such as in phrases or sentences. Being able to give definitions such as nouns being names of objects or verbs being about actions or activities would not be as useful as receiving input on the context of where and how specific words are used. Of course, this does not mean that labels such as N, V should not be used at all. The point is that we should take advantage of what learners already knew and do not confuse learners with instructions that might not be very helpful. For instance, for English learners of Chinese, their (implicit) knowledge about the English morphological markings of lexical categories can be helpful. English has many overt and precise, concrete clues to lexical categories – nouns take the singular or plural form and certain morphemes are indications of categories such as *-ness*, *-ity* for nouns, *-ful* for adjectives, *-ize* for verbs etc. Proper translation of Chinese words into more precise English correspondences that match in category and usage can be more helpful than emphasis on definitions of lexical categories. Labels such as Noun, Verb, Adjective can be placed alongside

proper translations in textbooks or reference books to allow for positive transfer of English speakers' knowledge of categories through morphological markings. In the classroom where the target language should be used predominantly, the input to learners in language classrooms should not be words in isolation. Attention should always be on larger phrases or sentences where relevant words are used.

Similar considerations apply to other universal grammatical notions such as subject, predicate, verb phrase, etc. These notions are shared by human languages (Universal Grammar). There is no need to explicitly explain and teach what these concepts are; however, it is important to provide clear input allowing learners to see these notions at work in the target language and know the context where a particular lexical item is generally found.

In brief, because language learning is the establishment and internalization of a system of rules through series of hypothesis-making based on input, testing of predictions against more data, and revision/confirmation of hypotheses, attention to form (rule formation) can be helpful, as supported by many experimental studies (such as those reported in the special issue of *Applied Linguistics*, 2015, 36.3; also see Note 2). This is especially important for the parts that are new or different from learners' established systems, which can benefit from teachers' guidance and facilitation of students' learning. That the notion of guidance or facilitation is used instead of "teaching" is to highlight the fact that learners' brains need to have opportunities to process the data they encounter and integrate newly-established rules to their existing system.

On the other hand, there are aspects of individual languages that learners do not need to spend much effort to learn – the parts that are UG or shared by L1 and L2. Explicit teaching of some of such notions might even be confusing to students (such as when they are not clearly defined or not easy to understand). What helps more is appropriate input. For instance, in the case of lexical categories, emphasis on the context where a lexical item occurs is much more important than properties of individual lexical items in isolation.

Learners benefit from abundant, unambiguous evidence in high quality input to identify UG properties and similarities between L1 and L2, and learn about re-setting of parameters, which involves the reassembly of features. Features are added or deleted, gradually adjusted according to perceived form-meaning mappings, as described in Section 1. Gradual adjustment is series of hypothesis-making based on meaningful input, testing of hypotheses, and revision/confirmation of hypotheses.

3.2 Teaching methodologies

Understanding the essence of generative grammar and its conceptions about human language, linguistic competence, and competence attainment can help

language teachers make well-informed decisions on how to teach. Implementations of the conceptions suggested in the previous sections can be successful via modifications of the current common approaches to second language instruction. Below I first briefly discuss the strengths and weaknesses of the current common practices in second language classrooms and then propose modifications that will allow learners to go through processes that promote successful learning. The issue of differentiation to accommodate individual variation in formal second language instruction programs will also be addressed.

The current second language classroom teaching can be understood as essentially following two main approaches (and various mixtures). One is an enlightened grammar and drill approach based on textbooks. It is grammar and drill in the sense that the focus is on grammar points and guided practices. Dialogues and other materials from textbooks are mostly supporting the learning of the rule system of the language. It is enlightened in the sense that many visual aids and activities are used to provide meaning and context for pattern practices. Nonetheless, the focus is on form, and the textbook-based curriculum puts more emphasis on completing a certain number of lessons by the end of each term than giving students opportunities to process, digest what is to be learned, and develop their linguistic competence. The sequence of lessons in each term is essentially those in textbooks. Grammar points and patterns are explicitly listed. Students see and hear the grammatical rules presented in the textbook and by the instructor, and are guided to practice patterns during most of the class time. The strengths of such an approach can be its predictable order, explicitness about the materials to be learned, including clear instructions on rules, and careful guidance of students through the learning process. However, under this approach, students mostly learn and practice in the frame or “in the mold” – guided practices. A frequently encountered challenge facing such an approach is that, when students are outside the mold, they tend to find difficulties putting the practiced materials to appropriate use, even after seemingly satisfactory practices in the classroom. A good example is the use of time or place adverbials in sentences in Chinese by English-speaking students. Even though students are taught and given many opportunities to practice the rules regarding how time and place adverbials can be used, mistakes are frequently found even among more advanced students (such as *wo chi-fan zai canting* ‘I ate at a restaurant’). Students easily forget or become confused about how to apply rules correctly outside the classroom. Students have many opportunities to listen to the instructor and follow the instructions in classrooms; they have many guided practices. However, they seem to be missing opportunities in truly understanding and using the rules on their own, testing the intermediate system of rules they formed according to their experiences, and integrating rules into their mental systems.

The other main approach focuses on content, performance-based learning. Evaluations are mostly based on completion of tasks requiring the use of language in real life or simulated situations. The curriculum is generally theme-based and only the target language is used. Students are immersed in the language – “immersion” environment. There is little explanation or practice specifically for grammar points or patterns. Textbooks are not a major source of learning materials. Students in such a performance-based, content-focused classroom are provided with many opportunities to use the language. Grammar is not explicitly taught. There is little teaching about the language and students are supposed to be able to acquire the system of the language and use the language in a meaningful manner. Students discover the rules of the target language by themselves during class and subsequent learning activities.

This approach seems to be good. After all, the goal of instructional design is to enable students to use the language. By having many opportunities to use the language, learners have the chance to form hypotheses from the input, to put their hypotheses to test, to make predictions and to work toward integrating the newly learned system to the existing one in the brain. Nonetheless, we often see some students struggling and seemingly lost in such language programs. Why is it that at least for some students, learning a language in this way seems to be much more challenging than others? Understanding how individuals, especially adult learners, differ in their abilities to acquire systems of rules in language classrooms and apply them would help us see the nature of the challenges.

More and more interesting brain studies have yielded significant results on what the traits of a good adult language learner is. A recent example is the experimental study by Ettliger, Bradlow and Wong (2014) (also see Ullman 2014, among others). They designed tests that allowed learners to discover rules through input of the target language and apply the rules they discovered to new situations. In their study, participants were trained on a single language incorporating simple and complex morphophonological processes, then tested on their ability to extrapolate the two grammatical patterns demonstrated by the data to novel untrained words. The result of their study showed that measures of declarative memory (for facts and also complex and analogical grammar learning), and procedural memory (for skills and sequences, concatenative grammar) are correlated with success at acquiring morphophonological patterns. Procedural memory supports the acquisition of all grammatical patterns, and declarative memory supports the acquisition of complex patterns. A distinction between “learners” and “non-learners” was made by this study accordingly. The distinction between “learners” and “non-learners” in Ettliger et al.’s sense can be understood as learners’ varying abilities in analyzing input to form hypotheses and putting them to tests. Recall that, according to the generative perspective of language learning, learners need

to be able to form hypotheses based on the preliminary data, make predictions according to hypotheses, test predictions, and then revise or confirm hypotheses. The cycle continues till proper hypotheses are formed, reaching an adequate system of rules for the target language. Some learners need more tries than others to process input and derive appropriate hypotheses. In the experimental settings as in Ettlenger et al.'s study, which provided the same quantity and quality of input for all the learners to process within the same limited length of time, some subjects were able to form proper hypotheses more quickly, integrate new rules to their existing system, and gain more success than others in the learning process in the fixed setting.

Formal second language instruction in college classrooms is similarly limited by the amount of time available and by the quantity and quality of input. Some students, the so-called “non-learners” in Ettlenger et al.'s sense, do not have as good procedural and declarative memory capacities as the so-called “learners” to understand and retain the fact, to discover rules (how the target language works according to the available input), and apply them to new situations with the limited input and time. This challenge most likely contributes to such students' struggling and losing interest in language learning in performance-based, content focused classrooms. They see some of their classmates performing well and feel frustrated. Therefore they might just give up on learning. They strongly feel the need for instructors to explicitly go through patterns one by one and teach grammar directly.

Briefly summarizing, under the enlightened grammar and drill textbook-based approach, teachers play a dominating role in classrooms. Students are taught rules explicitly and undergo mostly guided practices. They may follow and perform well in the class. However, they have few opportunities to actively use their brains to process what they have been taught, put the rules they learned to use in different situations (testing the predictions of the hypothesis), and integrate the new rules to their existing linguistic system. On the other hand, under the performance-based, content-focus “immersion” approach, even though students have more opportunities to use the language, the emphasis on performance at the expense of better preparing students for tasks makes some students unable to grasp what constitutes the linguistic system they need to acquire. There does not seem to be enough “teaching” to help students learn the system of rules. All in all, the fundamental challenge is how to provide a good quantity of high quality input, and provide effective assistance for students themselves to go through the steps of the learning procedure.

Given what we understand about linguistic competence from the perspective of generative grammar, what can we do to address these challenges? Recall that the generative perspective is that language is a brain system of symbolic

mental representations and rule-governed operations on those representations. Language learning requires learners themselves to undergo the learning process, from hypothesis making to testing and revision/confirmation of hypotheses, so that they can internalize the system in their brains. This puts learners at the center of the learning process, not teachers. Learners should be the center of the learning process from the beginning to the end. However, students' memory capacities affect their abilities to form hypotheses and apply to new situations. The quantity and quality of input will also affect learners' effectiveness in acquiring the rules of the system. All of these mean that teachers should not take a dominant role in the classroom, but create ample opportunities and help each student to learn about the rules of the target language – the initial hypothesis in their mind, and to put the hypothesis to test. Individual students should be given time and support to go through the learning process themselves, aided by teachers.³ How is this possible in language classrooms limited by time and group dynamics? How do we make sure that each student has opportunities to learn how the target language works before subjecting them to perform, using the target language in contexts?

4. Possible implementations

The challenge of second language instruction in classroom settings has been the limited amount of time to introduce and practice materials in every class period, let alone accommodating different needs of individual students and not boring or frustrating some students. How do we make the best use of the limited class time and enable each and every student to learn the best they can? Because class time provides the most valuable opportunity for the class and the teacher to meet, it should be for learning activities that require more interaction with fellow learners as well as the instructor. That is, the class time should be when students can put their hypotheses to tests, having opportunities to actively use the language in varieties of contexts. Nonetheless, students need to have the opportunity to

3. This echoes the well-recognized and widely-advocated learner-centered or student-centered approach to language and general learning (see, among many others, Bain 2004, Lambert and McCombs 1998, Lieberman 1992, Mallinger 1998, Nunan 1988, Papalia 1976, Vermilye 1975, Weimer 2002). The professional organization of the US world language instruction, American Council on the Teaching of Foreign Languages (ACTFL) emphasizes the central role of learners (<http://www.actfl.org/about-the-american-council-the-teaching-foreign-languages/resources>). The US federal language program STARTALK takes facilitating learner-centered classrooms as one of its six guiding principles (<https://startalk.umd.edu/principles/>).

form hypotheses in their brains first. When students can begin the learning process before coming to class, they would be ready to practice using the language. Beginning the learning process before class meetings would help address the challenges facing the enlightened grammar and drill approach and the performance, content-focus approach. For the former, students would be able to go beyond guided practices and gain opportunities to test their hypotheses in their brains outside frames. For the latter, everyone would be better prepared to handle the tasks in classrooms and perform more comfortably and satisfactorily. The so-called non-learners can be better guided individually because of the flexibility in learning outside classrooms.

This amounts to saying that some form of flipped learning should be more effective.⁴ In most language programs, homework is required regularly. Homework does not have to be review of the materials having been taught in the class. It can be pre-view of the materials to be learned, or more precisely, the chance for students to work through the new materials and to form their hypotheses in their minds.⁵ In other words, every student can be a mini-linguist.⁶ They can work through well-structured data adapted for language learners. For instance, instead of students coming to class expecting teachers to teach from step 1, students will be given relevant well-structured materials so that their brains can begin to pay attention to, understand and process the forms or rules in question. To illustrate, consider the case when the objective of a lesson is to familiarize students with the position of time expressions. Concrete tasks include being able to negotiate with friends what day they are going to have lunch together or what

4. According to the definition provided by the Flipped Learning Network <http://flippedlearning.org>, Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.

5. For programs that do not have any homework, classes can begin with small group activities for students to see and discuss with each other well-structured materials to be learned. The main point is, instead of teachers feeding students rules about the language, students should have opportunities to form or process rules in their minds.

6. Many thanks to Hongyin Tao (personal communication) for drawing my attention to Chris Livaccari's "Teaching Students to be Linguists: How to recognize patterns" available at <http://asiasociety.org/china-learning-initiatives/teach-students-be-linguists-how-recognize-patterns>. According to him, the key outcomes of teaching students to be linguists are "(1) students saw the connection between what we were learning in class and the 'real' world; (2) students became more confident in their ability to master difficult or unfamiliar language; and (3) students were beginning to think like linguists and to develop cognitive skills that they could apply beyond the Chinese or Japanese language classroom."

day they are going to watch movies together (and other activities students are familiar with). Such a lesson can begin with a list of the major sentences and key lexical items that students will use in the said activities, such as those below (and other similar ones):

- (5) 你星期一在学校吗?
 nǐ xīngqí-yī zài xuéxiào ma?
 you week-one at school Q
 'Are you at school on Monday?'
- (6) 我星期二上中文课。
 wǒ xīngqí-èr shàng zhōngwén kè.
 I week-two attend Chinese class
 'I attend Chinese classes on Tuesdays.'
- (7) 你星期日有空吗
 nǐ xīngqí-rì yǒu kòng ma
 you week-day have time Q
 'Do you have time on Sunday?'
- (8) 我们星期六去看电影好吗
 wǒmen xīngqí-liù qù kàn diànyǐng hǎo ma
 we week-six go see movie good Q
 'Let's go see a movie on Saturday, OK?'

The list is followed by questions such as the following ones:

- (9) a. What words are new to you? Make a list of new words.
 b. Where do you put time words – the days of the week, in these examples? How is the placement different from how you use such time words in English?
 c. Can you make two more sentences with such time words?

It might be even more fruitful to list some unacceptable examples such as *我上中文课星期二 wǒ shàng zhōngwén kè xīngqí-èr 'I attend Chinese classes on Tuesdays', letting students know explicitly that such word order is not allowed in this language. After all, the system of rules for a language is to define boundaries between possible and impossible sentences in the language. Making unacceptable sentences explicit to L2 learners can help learners identify the working of the rule system. The key is to draw students' attention to the form. Of course, students' progress on the task should be monitored. Different options can be considered, depending on the resources available for individual programs. For instance, a possibility is for students to send their answers by email to the instructor and the instructor need only respond to those having difficulties. Another option is to set up an interactive learning and feedback system in the

course website or a convenient website (many easy-to-use websites are available free of charge). Other options can be made to meet individual programs' needs with the available resources. It takes time initially to create an auto learning and feedback online system. However, after it is established, it can be used repeatedly for years to come. Moreover, many freely available online programs are very well designed and can be adapted quickly to fit specific needs. There are also many free resources available online or supplementary materials produced by textbook publishers or teachers in the field. The bottom line is that students should be led to pay attention to the linguistic form, and to have the opportunity to establish and process relevant generalizations in their minds as preview homework. When classes meet, the teacher can begin with reviewing of the materials through guided practices or simple questions and answers about what the students should have studied before class. Then, the rest of the class time can be devoted to scaffolding activities designed specifically for students to use the language in varieties of contexts. Students should be given opportunities to generate utterances that fit relevant scenarios. Practices can end with students performing activities that require them to use the sum of what they have learned.

The various components of a language can be taught and learned in a similar manner, including sounds, word formation, sentence patterns, discourse etc. Just to illustrate with one more example. For multiple connected sentences in discourse, Chinese tends to drop its arguments in sentences such as understood subjects, objects, or possessors being empty lexically. The notion of topic-prominence is important (e.g., Tsao 1977, Li and Thompson 1981, among many others). To help students understand the concepts and learn to drop arguments appropriately, it probably would be less effective to keep telling students that Chinese allows argument-drop (especially when not every argument can be dropped) than helping students discover this characteristic. Therefore, samples like the following can be given to the students first, followed by questions such as *how do you translate this paragraph into idiomatic English? What differences do you see between the Chinese and English paragraphs?*

- (10) 李明是我的好朋友,
 Lǐ Míng shì wǒ de hǎo péngyǒu,
 现在是南加大一年级的学生,
 xiànzài shì nán jiā dà yī niánjí de xuéshēng,
 住学校宿舍,
 zhù xuéxiào sùshè,
 家里很有钱,
 jiā lǐ hěn yǒu qián,

爸爸是工程师,
bàba shì gōngchéngshī
妈妈是大学教授
māmā shì dàxué jiàoshòu

‘Li Ming is my good friend. (He) is a first year student at USC now. (He) lives in the school dorm. (His) family is rich. (His) father is an engineer. (His) mother is a university professor.’

The English version need not be the one appearing above. Students might produce other options using participial structures, etc. Regardless, the fact that students themselves have to work through the paragraph and compare it with the English counterpart would allow them to experience first-hand what it means to drop an argument and how to interpret the missing argument. They can also be given opportunities to create more pieces using similar strategies. Groups of students can discuss their works and identify, compare how strategies apply to make their creations “sound or read like Chinese”.

In brief, the key is to engage students as early as possible, give them as many opportunities as possible to use their brains to process and put learning materials to use. Attention can be directed to form explicitly. Homework can be preview preparation work, guided by teachers and appropriately designed, well-structured materials. The class time is when students put to use the hypothesis they have formed in their minds so that their hypothesis can be confirmed/revised and integrated into the system of rules in their minds – the essence of Flipped Learning. Learners are the focus of the learning process – their minds are in active use during the entire learning process. A potential objection to such a proposal is that some programs do not require homework at all or some students simply cannot complete the required homework in time. However, even in such programs, it still helps to follow the sequence, engage learners at every step of the learning process, make students active learners and use their brains throughout the learning process, so that they can establish the system of rules of the target language in their brains more effectively.

5. Linguistic research and universal grammar

The previous section focused more on the procedural considerations for effective learning. Section 3.1 very briefly mentioned the content matter: what to teach explicitly and what to learn implicitly. This section briefly elaborates on how the distinction in different types of content (what to teach) is important to language learning and the distinction is made on the basis of theoretical linguistic research and Universal Grammar.

The sequence and involvement of learners under the approach proposed in Section 4 should be applicable to teaching and learning all aspects of a language (procedure); however, the details of how relevant data are presented and rules “taught” may vary according to how transparent a certain form is to students or how clearly rules can be formulated (content). There are instances when certain phenomena cannot be easily and explicitly captured by clear, simple, and observationally adequate rules. A better option would be to simply provide as clear input as possible and just draw students’ attention to the constructions without much emphasis on the form – implicit learning. Teachers’ efforts should be on providing students with opportunities to discover, form hypotheses in their minds. The series of hypothesis testing, revision and confirmation by learners can continue for as long as successful learning requires. In light of the presence of properties that are shared by human languages (Universal Grammar) and parameter-setting through good quantities and qualities of input, learners should be able to learn successfully without explicit teaching from the instructor. Such learning might be even more effective and less confusing in the cases where rules are not transparent or straightforward to describe. To illustrate, let us consider a phenomenon in Chinese that is more challenging to form simple and adequate rules for – the use of non-canonical arguments. Chinese generally allows the same types of arguments for similar verbs as English. For instance, verbs like *kick* or *hit* generally have two arguments as subjects and objects – the person that does the action and the entity that receives the action. However, Chinese is more flexible in the types of arguments that are possible in subject and object positions. This is demonstrated by the use of locative, temporal and instrumental expressions as objects of the verb in the following examples.

- (11) a. 他(打球)喜欢打晚上。 - temporal expression as object
 tā (dǎqiú) xǐhuān dǎ wǎnshàng.
 he hit ball like hit evening
 ‘He likes to play (ball) in evenings.’
- b. 他(踢球)是踢右脚。 - instrument as object
 tā tī qiú shì tī yòujiǎo.
 he kick ball be kick right foot
 ‘He kicks (ball) with the right foot.’
- c. 他(画画儿)只画了一面墙。 - location as object
 tā huà huà'er zhǐ huà le yī-miàn qiáng
 he draw picture only draw one-Classifier wall
 ‘He only drew (pictures) on a wall.’

The objects in these sentences are not the canonical objects for the relevant verbs. The canonical objects in these cases are those with the first occurrence of the

verbs: ‘ball’ for ‘hit’ and ‘kick’, and ‘pictures’ for ‘draw.’ The translation indicates that these temporal, instrumental and locative expressions are like prepositional phrases (PP) in English. Indeed, it is also possible to use PPs to express similar meanings:

- (12) a. 他只喜欢在晚上打球。
 tā zhǐ xǐhuān zài wǎnshàng dǎqiú
 he only like at evening hit ball
 ‘He only likes to play ball in evenings.’
- b. 他用右脚踢球。
 tā yòng yòu jiǎo tī qiú
 he use right foot kick ball
 ‘He kicks ball with the right foot.’
- c. 他只在一面墙画了画儿。
 tā zhǐ zài yī-miàn qiáng huà le huà er
 he only at one-Classifier wall drew picture
 ‘He only drew pictures on a wall.’

As indicated by the translations for each of the examples, English generally uses PPs for such expressions. Thus, a preliminary observation seems to be that the preposition of a PP is dropped and the noun phrase of the PP becomes the object of the verb. That is, Chinese seems to have the flexibility of not using prepositions for such expressions and allowing relevant noun phrases to appear in the postverbal object position. Some rule like the following one might take shape: delete the preposition before a noun phrase and put the noun phrase in the object position. However, teaching students or leading students to form such a rule would create many wrong expressions, such as 他[在[图书馆/家里]]念书 Tā [zài [túshū guǎn/jiālǐ]] niànshū ‘He studies at the library/at home’ → *他念图书馆/家里 Tā niàn túshū guǎn/jiālǐ. These and many other unacceptable cases are due to pragmatic and grammatical constraints pertinent to this pattern. As demonstrated in Lin (2001), Zhang (2005), Li (2014), among others, the option of a non-canonical object is subject to the conventions of the speech community and the meaning of such non-canonical objects can be different from that of the PP counterpart.⁷ Moreover, Barrie and Li (2015a, b) show that the availability of non-canonical objects is not unique to Chinese. It is found in languages and constructions of specific types, such as English noun-verb compounding structures and noun-incorporation constructions in Northern Iroquoian languages. However,

7. For instance, as Zhang (2005) and others noted, 他不喜欢在食堂吃饭 Tā bù xǐhuān zài shítáng chīfàn ‘He does not like to eat at the canteen’ differs from 他不喜欢吃食堂 Tā bù xǐhuān chī chī shítáng ‘He does not like to eat canteen (food)’ in that the event in the former must take place at the canteen but the latter can be outside the canteen as long as the food is from the canteen.

the apparent flexibility is subject to restrictions not only pragmatically but also grammatically. All the relevant constructions in the languages mentioned generally do not allow comitative, benefactive, or goal-recipient expressions to occupy the object position and appear without prepositions (in English, generally *with* for comitatives, *for* for benefactives, and *to* for goal-recipients). Without going into theoretical discussions and analytic details, we can just state here the conclusion according to the research by Barrie and Li: the use of non-canonical objects is correlated with the properties of morphological cases in individual languages and constructions. That is, this is a possible parameter in UG. Accordingly, learning the construction containing non-canonical objects should not be difficult theoretically. Input of good quality and quantity should trigger the learning process.

The learning or teaching of the non-canonical object construction can be contrasted with that of time expressions mentioned above or relative clauses. The latter generally receive much clearer instruction and greater emphasis in language teaching materials and classrooms; whereas the former tend to be neglected. Nonetheless, examples for the non-canonical object construction can be found even in beginning language classes, such as *Nǐ zuò zhè-bǎ yǐzi* ‘you sit (on) this chair’, *Nǐ zhàn zhōngjiān* ‘you stand (in) the middle’. Differences in the attention to these constructions and the rules describing them can be understood in terms of rule transparency. The positioning of time expressions can be straightforwardly stated. Relative clauses in Chinese can be easily described by contrasting them with their English counterpart: *the apple that he ate* vs. ‘he ate *de* apple’, *the person that visited him* vs. ‘visited him *de* person’. However, it is more of a challenge to describe the complex pragmatic and grammatical constraints integral to non-canonical object constructions in simple and clear language comprehensible to various levels of learners. Linguistic research shows that the construction cannot be simply stated as dropping a preposition and placing the noun phrase in the postverbal object position. Factors involved are complex and not obvious. The relative complexity of the construction suggests that implicit learning would be preferred over explicit teaching, to avoid confusion and over-generation.

In brief, not all aspects about the rules of a language have the same degree of complexity. Indeed, not all have been equally understood.⁸ The results of linguistic research can inform teachers, authors for language learning materials, and curriculum designers on what can benefit from explicit teaching and what can be better learned implicitly.

8. The disposal *ba* construction is an example. Despite the massive literature on this construction, it would be presumptuous to say that this construction can now be clearly and adequately described.

6. Conclusion

There have been questions raised and responses made regarding the issue of whether generative linguistic studies have contributed to the field of language teaching. This paper adds to this line of discussion by approaching the issue from the theoretical and conceptual perspective. Methodologically, language teaching adopting the insight of generative grammar should focus on the important role of learners – it is in the learner’s mind that a linguistic system is processed and internalized. A teacher can facilitate and guide students’ learning but cannot learn on students’ behalf. The generative perspective also emphasizes the quantity and quality of input and opportunities for learners to use the language so that learners can more effectively form appropriate hypotheses, put them to test, and revise/confirm hypotheses. Such a learning process can benefit from teachers’ guidance through well-organized and well-structured input, as well as attention to the linguistic form. Given the limited class time in formal second language learning and the importance for learners to be able to put the hypotheses in their minds to test, homework as preparation for class activities (some form of flipped learning) can lay a solid foundation to overcome differences among individual students and help every student achieve success in classrooms. In addition to helping teachers make well-informed decisions on teaching methodologies, the theoretical research and the concept of Universal Grammar/parameter also help distinguish the parts of grammar that can benefit more from explicit teaching or implicit learning. These considerations will strengthen the argument by Slabakova et al. (2014, 2015) that the generative research has been and will continue contributing to language teaching. Moreover, it is clear that the language teaching field has also advocated for the major points derived from the generative theoretical and conceptual reasoning, such as attention to form, input of good quality and quantity, learners as center in the learning process, some form of flipped learning. Researchers and practitioners of different orientations can actually agree on much substance!

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