### Do L2 Grammars Go Beyond the L1 and L2 Input?

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#### 1. Introduction

Under normal circumstances, acquiring a first language, compared to acquiring a second or third language, seems to come naturally and successfully. This natural process of first language acquisition (henceforth L1A) appears to be illogical. This is because what first language learners (henceforth L1ers) attain (i.e. a grammar of adult native speakers of a given language) goes beyond the positive language stimuli to which they are exposed, and the positive language stimuli seem to be erratic and chaotic. In other words, the input underdetermines the mature grammar of a given language that they attain. The puzzle is how they manage to acquire the mature grammar with comparatively insufficient and impoverished input, which is the so-called logical problem in L1A. To account for the logical problem, an innate mechanism that constrains what is possible in human languages is suggested to guide L1A. This built-in mechanism reduces the burden of the acquisition task for L1ers, and L1ers thus can successfully and rapidly attain an adult grammar of a language with deficient input (poverty of the stimulus) (Cook 1991; Gregg 1996; White 1989). In other words, this mechanism, called Universal Grammar (henceforth UG), makes L1A possible.

In the 1980s, UG was characterized as the principles and parameters (e.g. Chomsky 1981, 1986); that is, UG consists of a set of principles, which are universal and invariant, and parameters with binary values, which account for cross-linguistic variations. Later, in the 1990s, the Minimalist program was developed. Accordingly, UG is argued to be composed of the lexicon, the two interpretive linguistic levels (i.e. articulatory-perceptual (PF) and conceptual-intentional (LF)), and the computational operations (i.e. Select, Merge and Move) (Chomsky 1995). A more recent Minimalism proposal (Chomsky 2001) reduces the computation system to Agree and Move. Nevertheless, Minimalism assumes that the computational operations are cross-linguistically invariant and differences between human languages reside in the morpholexicon (i.e. morphological components and lexical items). The morpholexical information is further elucidated by grammatical categories/features (i.e. functional and lexical) and represented structurally.

No matter how UG is formalized, what is more important in terms of L1A is that L1ers are arguably born with the universal built-in mechanism at the initial stage S0 of their L1A. Then with exposure to the primary linguistic data of a language, L1ers only have to set proper values of permissible variations (i.e. parameters or grammatical categories and features) made available by UG as invariant principles or the computational operations do not have to be learned. Chomsky regards this language acquisition process as "a function mapping experience (primary linguistic data, PLD) to a language" (Chomsky 1995: p.169). It can be conceptualized as "proceeding from a genetically determined initial state S0 to through a sequence of stages S1, S2..., finally arriving at a steady state Ss ," (Chomsky 1980: p.37). With the genetically built-in UG, across the board L1ers attain the mature grammar of a given language without much difficulty.

As discussed above, UG is believed to constitute the initial state of L1A and makes L1A possible. However, as far as second language acquisition (henceforth L2A) is concerned, whether UG works in the same fashion in L2A as in L1A is disputable. Unlike L1A, in which L1ers start out with a clean plate along with UG, what constructs the initial state in L2A gives rise to disputation (White 2000, and many others). It is because not only the availability of UG but also a fully developed adult grammar (i.e. L1 grammar) needs to be taken into consideration. Given the assumption of Minimalism that cross-linguistic variations are rooted in morpholexicon and that morphosyntactic properties are now formalized in terms of grammatical categories (lexical and functional) and their associated features, the

questions being asked now are whether the L2 initial stage consists of all the grammatical categories and associated features of second language learners' mother tongue, and whether second language learners (henceforth L2ers) still have access to UG for interlanguage (re)structuring (i.e. parametric options which are not instantiated in the L1 or L1 values which differ from the target grammar) in L2A. Studies in L2A hold different views on the role of native languages and the accessibility of UG in L2A<sup>1</sup>. To prove that L2ers still have the access to the full inventory of UG to guide L2A, the evidence has to show that L2ers have the abstract knowledge which is neither observable from the L2 input nor instantiated in their L1 grammar. In other words, the source of this abstract knowledge solely comes from UG. White (2003a) explicitly points out that to determine whether L2ers have full access to UG, ideally the data should fulfill the following two conditions:

- i. The phenomenon being investigated must be underdetermined by the L2 input. That is, it must not be something that could be acquired by observation of the L2 input, including statistical inferencing based on frequency of occurrence, on the basis of analogy, or on the basis of instruction;
- ii. The phenomenon should work differently in the L1 and the L2. That is, it must be underdetermined by the L1 grammar as well. In this way, transfer of surface properties can be ruled out as an explanation of any knowledge that L2 learners attain (White 2003a: p.23).

Few studies in the literature actually directly target on the logical problem in L2A. Kenno's (1997) study regarding OPC (overt pronoun constraint) in adult English learners' Japanese acquisition indicates that English learners of Japanese were able to restrict overt pronouns to the co-reference with quantified antecedents in their L2 Japanese grammars, and this knowledge is found to be from neither the L2 input nor their L1 English grammar. This supports the existence of the logical problem in L2A.

Such evidence for the existence of the logical problem in L2A can be also provided by a study of English L2ers' acquisition of Mandarin classifiers<sup>2</sup>. Mandarin classifiers are one of the syntactic properties that differentiate Mandarin from English. In Mandarin, a classifier is syntactically required when a numeral is used (e.g. yi zhi bi "one-classifier-pen"). Moreover, classifiers cannot be modified by adjectives, suffixed with the modification marker -de or followed by mass nouns (Cheng and Sybesma 1998, 1999). English, unlike Mandarin, licenses measure words, which are optional in numeral phrases. Additionally they can be modified by adjectives and require the preposition of to take mass or count nouns as complements. It is thus contended that the functional category CLP is projected with the feature [+count] in Mandarin, not in English where measure words are a lexical category. The distinction between classifiers and measure words is neither instructed in L2 classrooms nor observable in the input. If English L2ers can acquire CLP in their L2 Mandarin grammars, it cannot come from English, and this evidence meets the previously-stated criteria and makes a strong case of the operation of UG in interlanguage grammars. In the following, we will first discuss the parametric differences between Mandarin classifiers and English measure words in more details. Then we will argue how English learners' acquisition of Mandarin classifiers can provide some evidence that UG is still operative in L2A.

#### 2. Syntactic properties of classifiers and measure words

Mandarin is typologically regarded as one of the numeral classifier languages<sup>3</sup> for two reasons. One is that most nouns in Mandarin are classified according to the inherent characteristics of the entities to which they refer, and the other is that most nouns co-occur with the semantically-associated classifiers in

<sup>&</sup>lt;sup>1</sup> For a detailed discussion of the different positions regarding the role of native languages and availability of UG in L2A, see Gregg (1996), Hawkins (2001), and White (1990, 1996, 2000, 2003b).

<sup>&</sup>lt;sup>2</sup> In Mandarin, classifiers can be further divided into nominal classifiers and verbal classifiers. In the present study, we are only concerned with nominal classifiers. For verbal classifiers, please see Wu (2000, 2002). In the present study, 'classifiers' refers only to nominal classifiers unless otherwise specified.

<sup>&</sup>lt;sup>3</sup> See Allen (1977) for the details of the criteria a language should possess to be regarded as a classifier language, and for types of classifier languages.

numeric expressions. More specifically, Mandarin classifiers are realized by a set of specific morphological forms, and occur with nouns in accordance with the associated semantic domains (e.g. shape) in numeric expressions (Allan 1977; Chao 1968; Chen 1996; Dixon 1986; Li 1999b; Loke 1982, and many others). Classifiers are one of the most distinct syntactic properties that differentiate Mandarin from English. This study mainly concerns the syntactic aspects of Mandarin classifiers and how they are structurally represented in English learners' L2 Mandarin grammars.

In Mandarin nominal phrases (the linear word order), lexical NPs appear at the right end of nominal phrases and all other elements occur to the left of lexical NPs. The canonical internal word order of a Mandarin numeric expression is numeral-classifier-noun, and other prenominal elements, such as adjectives, can be placed between two elements in the sequence, as shown in (1a). In (1a), san 'three' precedes the classifier ben. ben selects shu 'book' as its complement, and the adjective meilide 'pretty' goes between the classifier ben and the lexical NP shu. On the surface, it seems that Mandarin classifiers are similar to English measure words, as shown in (1b). By looking into the nature of Mandarin classifiers and English measure words, four differences can be identified.

(1) a. san ben meilide shu three Cl beautiful book three beautiful books b. three boxes of beautiful books

The first difference is that a Mandarin classifier is obligatory in a nominal phrase containing a numeral; this, however, is not the case in English, as shown in (2). Moreover, Mandarin also licenses measure words like English does, as shown in (3).

(2) \*(ben) shu xiang pingguo san (3) yi three Cl book one box apple three books one box of apples

Another piece of evidence is that Mandarin classifiers cannot be modified by adjectives while English measure words can, as shown in (4). Moreover, the morpheme *de* is a marker of possession, relative clauses, and pre-nominal adjectives (Gao 1994; Simpson 2002; Tang 1993) and is known as a modification marker (MM). It is observed that *-de* cannot be suffixed to a classifier, as in shown (5). In contrast, the preposition *of* is syntactically required for English measure words to take complements.

(4) \*a. liang da (5) san (\*de) ba dao ben shu three two Cl knife Cl (book-like) MM book big three books two big knives b. two big pieces of bread

The final observed difference is that Mandarin classifiers can only take count nouns as complements, but English measure words can both count and mass nouns as complements, as shown in (6). In (6a), the classifier *ge* can only be applied to *pingguo* "apple", which comes as an inherent and discrete unit, but not to *shui* "water", as shown in (6b), because water does not occur as an inherent and discrete unit. Mandarin classifiers are thus argued to mark countability (Cheng and Sybesma 1998, 1999). In (6c), the English measure words *bucket* can take *apples* and *water*.

(6) a. yi ge pingguo b. \*b. yi ge shui c. a bucket of apples/water one Cl apple one Cl water one apple

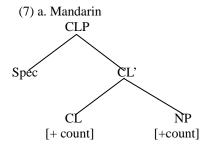
Mandarin not only licenses classifiers but also measure words. Mandarin measure words behave like their English counterparts, which are compatible with modification and mass nouns. Moreover, Mandarin measure words can be suffixed with -de. To recap, Mandarin classifiers differ from English

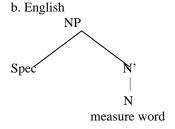
measure words in that the former are obligatory in numeral phrases, incompatible with modification, modification marker suffixation and mass nouns, as summarized in Table 1.

Table 1:The differences between	en Mandarin classifiers	and English measure words
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classifiers/measure words syntactic properties	Mandarin classifiers	English measure words				
obligatory use of classifiers in numeral phrases	yes	no				
modification	no	yes				
modification marker suffixation	no (-de suffixation)	of-insertion				
selecting only count nouns as complements	yes	no				

On the basis of the syntactic differences between Mandarin classifiers and English measure words, the following two structures are assumed for Mandarin numeral phrases (Li 1998, 1999a) and English numeral phrases, as shown in (7). Measure words in English and Mandarin are NPs and base-generated under N. We follow Doetjes' claim (1997) that countability is made visible in syntax through Mandarin classifiers. As shown in (7), the feature [+count] is thus posited under the classifier projection (CLP).





#### 3. Empirical study

#### 3.1. Subjects

The subjects recruited for this empirical study were 80 adult English-speaking learners of L2 Mandarin. They were mainly recruited in the Chinese language centers in Taiwan. A cloze test was employed in this study for classifying the subjects into four proficiency groups. According to the scores obtained from the cloze test, the subjects who scored 0-10 were placed in a beginner group (BE). Those who scored 11-20 were placed in a low intermediate group (LI), 21-29 in a high intermediate group (HI), and 30-40 in an advanced group (AD). Moreover, 20 Mandarin native speakers were recruited in Taiwan as controls (NC).

#### 3.2. Task

An acceptability judgment (AJ) task was employed for data collection. Four sentence types were used in the AJ task to ascertain the projection of CLP in L2 Mandarin grammars<sup>4</sup>. For seeking an assurance that judgments are made on the basis of aspects relevant to the purposes of this study, sentence types are designed in a pair-wise fashion to minimize differences between the test sentences to one, as shown in (8). Four test sentences were allocated to each sentence type.

# (8) (a) <u>obligatory use of Mandarin classifiers in numeral phrases</u> **Sentence Type 1**: a. numeral + classifier + noun \*b. numeral + noun

<sup>4</sup> The current study is part of the author's Ph.D work. Only relevant sentence types are reported here. The original AJ task consists of 95 test sentences, including 11 fillers.

(b) incompatibility of classifiers with modification

**Sentence Type 2**: a. numeral + classifier + adjective + noun

\*b. numeral + adjective + classifier + noun

(c) incompatibility of classifiers with –de suffixation

**Sentence Type 3**:a. numeral + classifier + noun

\*b. numeral + classifier + de + noun

(d) incompatibility of classifiers with mass nouns

**Sentence Type 4**: a. numeral + the general classifier *ge* + countable noun \*b. numeral+the general classifier *ge*+uncountable+noun

#### 3.3. Procedure

In the AJ task, the subjects were required to make judgments on whether the test sentences are acceptable or unacceptable with a five-point scale (from -2 to +2). A value of +2 indicates that a given test sentence is completely acceptable and that of -2 indicates that a given test sentence is completely unacceptable. All the data were collected in small groups or individually and in the presence of the researcher. Moreover, a training session was given to all subjects prior to the task to ensure that the task was done properly.

#### 4. Results

The obtained scores of four test sentences of each sentence type (control sentences and experimental sentences) were averaged for each group. The average score of +1 and above indicates acceptance of a given sentence pattern, and the average score of -1 and below suggests rejection. As White (2003b) explicitly argues, in an acceptability judgment task, it is not necessary for L2ers to perform to the same level as native speakers for an indication of the acquisition of a particular grammar. She also suggests that as long as there is evidence that L2ers can distinguish one structure from another in terms of acceptability, the property under investigation is present in L2 grammars. Results of the acceptability judgment task by the English L2ers of Mandarin in this study were analyzed accordingly. The results are shown in Table 2.

Table 2: Results of English L2ers' judgments in an acceptability judgment test

Group	English learners			Native	
test sentences <sup>a</sup>	BE	low-inter	high-inter	advanced	control
Con: Num+Cl+N;	1.3	1.63	1.76	1.85	2.00
*Ex: numeral+noun	-1.19	-1.33	-1.71	-1.9	-1.93
Con: Num+Cl+Adj+N;	0.89	0.91	1.28	1.66	1.99
*Ex: Num+Adj+Cl+N	-0.46	-0.94	-1.41	-1.66	-1.86
Con: Num+Cl+N	1.3	1.63	1.76	1.85	2.00
*Ex: Num+Cl-de+N	-0.54	-1.06	-1.31	-1.56	-1.28
Con: Num+Cl+Count-N	1.1	1.35	1.6	1.75	1.98
*Ex: Num+Cl+Mass-N	-0.16	-0.38	-1.11	-1.08	-1.68

a. Con: Control Sentences; Ex: experimental sentences; Num: numeral; Cl: classifier; N: noun;
 Adi: adjective: MW: measure words

Note that to ascertain the projection of CLP in English learners' L2 Mandarin grammars, L2ers should acquire the obligatory use of classifiers and the incompatibility of classifiers with modification and -de suffixation. CLP is specified with the feature [+count] when the incompatibility of classifiers with mass nouns is respected. As can be seen in Table 2, while accepting all the control sentences of the four sentence types, the BE group only correctly rejected the omission of classifiers in numeral phrases with a score of -1.19, but failed to reject classifiers modified by adjectives, suffixed by -de, and followed by mass nouns with scores of -0.46, -0.54 and -0.16 respectively. This failure seems to suggest that CLP is not projected yet at the BE stage of English learners' L2 Mandarin grammars.

With the increase of proficiency, the LI group, like the BE group, accepted all the control sentences

of the four sentence types with scores ranging from  $0.91^5$  to 1.63. In addition, the LI group successfully rejected not only the omission of classifiers in numeral phrases with a score of -1.33, but also classifiers modified by adjectives with a score of -0.94<sup>6</sup> and classifiers suffixed with -de with a score of -1.06. This suggests that CLP is projected at the LI stage of English learners' L2 Mandarin grammars. However, the LI group failed to reject classifiers followed by mass nouns, which indicates that the feature [+count] of CLP is still underspecified. In other words, at the LI stage, CLP is projected with the underspecified feature [+count].

With proficiency further improved, the HI and AD groups accepted all the control sentences of each sentence type with score ranging from 1.28 to 1.85. Moreover, with scores all passing the threshold of -1, they successfully rejected the omission of classifiers in numeral phrases, classifiers modified by adjectives, classifiers suffixed with -de, and classifiers followed by mass nouns. This suggests that CLP is projected with the feature [+count] at the HI and AD stages of English learners' L2 Mandarin grammars, as shown in (7a). In other words, Mandarin classifiers at the HI and AD stages converge on those of native Mandarin grammars.

#### 5. Discussion

Results of our AJ task suggest that new functional categories and features (i.e. CLP and the feature [+count]) can be acquired in English learners' L2 Mandarin grammars. A question may arise as to what triggers the projection of CLP and its feature [+count] at the HI and AD stages of English learners' L2 Mandarin grammars. This question can be approached two-fold: L2 Mandarin input and L2ers' native language (i.e. English).

Obviously, the positive evidence containing Mandarin nominal phrases like "numeral+Cl+count noun" is in abundance in L2 Mandarin input data. However, the positive evidence alone only tells L2ers what is grammatical or acceptable, and it does not inform L2ers what is ungrammatical or unacceptable (c.f. Trahey and White 1993). Specifically, Mandarin nominal phrases like "numeral+Cl+count noun" do not clearly notify English L2ers that Mandarin classifiers are obligatory in numeral phrases, and they cannot be modified by adjectives, suffixed with -de, or followed by mass nouns.

One may argue that absence of some syntactic structures in L2 input data indirectly inform L2ers that those structures are not grammatical or acceptable in the target language (i.e. indirect negative evidence) (e.g. Chomsky 1981; White 1989; Plough 1995). Recall that Mandarin licenses not only classifiers but also measure words, and that classifiers or measure words are syntactically obligatory in Mandarin when numerals are realized. Given that the positive evidence in L2 Mandarin input does not contain numeral phrases without classifiers or measure words (the indirect negative evidence), this may inform L2ers that classifiers or measure words are syntactically obligatory in Mandarin numeral phrases. This indirect negative evidence may trigger the projection of CIP in L2 Mandarin grammars. However, this indirect negative evidence is not absolutely straightforward or clear with respect to the other syntactic specifications of Mandarin classifiers (i.e. the incompatibility of classifiers with modification, -de suffixation and mass nouns). The syntactic distribution of measure words (i.e. numeral+measure word+mass/count noun) is superficially similar to that of classifiers (i.e. numeral+Cl+count noun). Moreover, Mandarin measure words can be modified by adjectives, suffixed with -de, and followed by mass and count nouns whereas Mandarin classifiers cannot. Although English L2ers do not come across the L2 Mandarin input containing classifiers modified by adjectives, suffixed with -de, or followed by mass nouns, they may come across measure words modified by adjectives, or suffixed with -de, or followed by mass nouns. Due to the fact that Mandarin measure words are superficially similar to Mandarin classifiers in terms of syntactic distribution, indirect negative evidence alone does not seem to clearly inform English L2ers that Mandarin classifiers cannot be modified by adjectives, suffixed with -de or followed by mass nouns. In other words, indirect negative evidence alone cannot be the

<sup>&</sup>lt;sup>5</sup> Even though the score of the control sentences of Sentence Type 2 (Num+Cl+Adj+N) is only 0.91 (below the threshold of +1), it indicates that the English LI group showed a great tendency to accept this control sentence.

<sup>&</sup>lt;sup>6</sup> The score of the experimental sentences of Sentence Type 2 (\*Num+Adj+Cl+N) obtained by the LI group is -0.94. It is only slightly above the threshold -1 and it is regarded that the LI group showed a great tendency to reject this experimental sentence.

trigger of the abstract knowledge that English L2ers at the HI and AD stage possess (i.e. the incompatibility of classifiers with modification, -de suffixation and mass nouns).

Moreover, direct negative evidence does not seem to be available to English L2ers, either. To the best of my knowledge, none of the Mandarin learning textbooks available on the market make a distinction between Mandarin classifiers and measure words, and Mandarin classifiers and measure words are treated the same and called *liangci* "measure word". In addition, most Mandarin instructors and native speakers are not consciously aware of the distinctions between Mandarin classifiers and measure words. Given this, Mandarin instructors do not explicitly teach their students that Mandarin classifiers cannot be modified by adjectives, suffixed with –de or followed by mass nouns although they may inform their students that *liangci* "measure word" is obligatory in Mandarin numeral phrases. Furthermore, although English L2ers may receive some corrective feedback when producing ill-formed patterns (e.g. classifiers suffixed with -de), corrective feedback is not reliable given that L2ers are not always corrected when they make mistakes. In addition, corrective feedback may only temporarily change L2er's language behavior, not L2ers' interlanguage representations (e.g. Carroll 1995; Schwartz 1993).

In brief, the positive evidence in L2 Mandarin input does not provide information about the ungrammaticality of the omission of classifiers in numeral phrases and classifiers modified by adjectives, suffixed with -de and followed by mass nouns. The indirect negative evidence and instruction that L2ers receive may inform L2ers that classifiers or measure words are obligatory in Mandarin numeral phrases However, indirect negative evidence or negative evidence is not readily available or reliable with respect to the syntactic specifications of Mandarin classifiers (i.e. the ungrammaticality of classifiers modified by adjectives, suffixed with -de and followed by mass nouns). All of these collectively suggest that L2 Mandarin input data underdetermine the syntactic specifications of CLP in English learners' L2 Mandarin grammars. Another source of L2A of CLP is L2ers' native languages. However, the resort to learners' native language cannot be the case for English L2ers due to the unavailability of classifiers in English.

As discussed earlier, to prove that L2ers still have the access to the full inventory of UG to guide L2A, the evidence has to show that L2ers have the abstract knowledge which is neither observable from the L2 input nor instantiated in their L1 grammar. Our results show that English L2ers at the HI and AD stages of Mandarin grammars possess the abstract knowledge of the syntactic specifications of Mandarin classifiers. This knowledge is not explicitly revealed (underdetermined) by L2 Mandarin input nor can be obtained through English L2ers' native language. In other words, our English L2ers' data with respect to CLP imply that English L2ers have full access to UG, and UG facilitates their acquisition of the syntactic specifications of CLP. This further implies that there exists a logical problem in L2A and UG is available to guide L2A.

#### 6. Conclusion

This study examined English learners' acquisition of Mandarin classifiers to explore whether L2ers still have access to the full inventory of UG in L2A. Our results from an AJ task demonstrated that English L2ers at the HI and AD stages successfully acquired the abstract knowledge of Mandarin classifiers (i.e. the ungrammaticality of classifiers modified by adjectives, suffixed with -de and followed by mass nouns), which suggests the projection of CLP and its feature [+count] in their L2 Mandarin grammars. This abstract knowledge is underdetermined by L2 Mandarin input data and unobtainable through their native language English. First, the knowledge is not explicitly taught since it is not in the textbooks, and instructors are not consciously aware of it. Second, the positive evidence alone (e.g. numeral+classifierl+count noun) does not inform English L2ers the ungrammaticality. Third, although indirect negative evidence might inform English L2ers the ungrammaticality, it is not straightforward due to the fact that the syntactic distribution of measure words is superficially similar to that of classifiers (i.e. numeral+measure word+mass/count noun). Fourth, although English L2ers may receive corrective feedback when ill-formed patterns are produced, it is not reliable and may only temporarily change English L2ers' language behavior, not their L2 Mandarin grammars. Finally, the knowledge cannot come from their L1 English due to the unavailability of classifiers. All of these collectively suggest that there exists a logical problem in English L2ers' acquisition of Mandarin classifiers. Our findings provide us evidence that UG is operative in L2 grammars.

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