A FUNCTIONAL-STRATIFICATIONAL ANALYSIS OF *WHAT*-CLAUSES FOR PEDAGOGICAL GRAMMAR

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1. Introduction

Learning a foreign language takes much time and energy; learning it efficiently means something more than just a consumption of time and energy. For the same reasons, both linguistic theorists and language teachers have been trying hard for centuries to find some methods or techniques that would greatly facilitate language learning processes. Rapid philosophical and methodological shifts in the field of language teaching are a convincing manifestation of such attempts (Yang 1995). From the Direct Method to the Audio-Lingual Method, from the interest in structure to the emphasis on communicative competence, specialists in the field have been sensitive to all major changes in linguistics and psychology. As consumers of theory, language teachers do need to keep alert to any new development in relevant fields. On the other hand, it seems to be more helpful if we could develop an eclectic philosophy in our teaching and introduce what has been proven good into our classroom to make the task of language learning as least inhibitory as possible (Sweet 1926 [1964]; Palmer 1921 [1964]; Girard 1986; Prabhu 1990; Yang 1995). The need for sensitivity to new theories in linguistics and psychology, and the practicality of realizing the results of these developments in teaching activities seem to be two serious tasks for any language teacher to undertake (Yang 1997b). The demanding requirements of the profession, however, by no means stop here. As it is only too well known, languages are different in many aspects. Therefore, a third challenge comes from a full awareness of language-specific differences at different levels of language structure (i.e., phonology, syntax and semantics) and, perhaps more importantly, the

need to find efficient ways to help language learners overcome inhibitions produced by these differences.

Taking all these considerations together, the present study attempts to provide a functional-stratificational analysis of *what*-clauses for pedagogical grammar (cf. Ravem 1974; Brown 1968). The reasons for doing this are multifaceted. First, the cross-linguistic uniqueness of this structure and its difficulty for Chinese-speaking learners of English at different levels are observed. On the other hand, it is believed that different linguistic theories, though philosophically incompatible with each other, could be equally used to solve classroom problems, if handled carefully. More specifically, two linguistic models, namely, the concepts of meaning potential and verbal pivot from Functional Grammar (Halliday 1985) and X-Bar Theory from TG grammar (Chomsky 1970; cf. Newmeyer 1980) are employed and co-operated with a task-oriented functional-stratificational model to deal with the problem in question that otherwise cannot be dealt with satisfactorily. By attempting these goals, language teachers are also encouraged to consume "hard" linguistic theories in a productive way so that more innovative and effective classroom-based practices, as the "product" of this theoretic endeavor, will come out from their own "workshop".

The present paper is composed of five parts. As has been already shown, Part One gives some introductory remarks about the relationship between the theory of linguistics and psychology and its application in the language teaching field. Part Two attempts to provide an analysis of *what*-clauses from a stratificational perspective. For this purpose, two *what*-forms, isomorphic and dimorphic, are identified and redefined for classroom use. A functional-stratificational rule is developed from two major linguistic theories (i.e., TG Grammar and Functional Grammar) in Part Three for a global treatment of *what*-clauses. Following this, in Part Four, the rule is further expanded and used as a more generalized structural model to analyze English phrasal structures. Part Five reinforces the need for language teachers to consume all theories available, and calls for more attempts like this for the benefit of language learners.

2. A Stratificational Model

Structurally and semantically speaking, *what*-clauses in English can be conveniently divided into two sub-categories. For the purpose of the present study, one should be labeled as isomorphic *what*-clauses, the other as dimorphic *what*-clauses. Here are some example sentences to illustrate this intrinsic distinction:

(1) *What did she do?*
(2) *What he didn't know was rare.*

Upon a quick perusal, sentences (1) and (2) look similar. A careful analysis will, however, show that they are different in many respects. For instance, the *what*-form in sentence (1) is a direct product of employing a transformational rule called the *wh*-movement in TG Grammar, whereas this can not be said of its peer in sentence (2) (cf. Chomsky 1977; Ravem 1974; Brown 1968). The fact can be further illustrated if these sentences are represented at their deep structure:

(3) a. she past do *what*
     b. *he past not know *what* past be rare

By using the transformational rule of *wh*-movement, we can move *what* in sentence (3a) at the initial position and leave an empty trace (e) behind to indicate its original position, as shown by sentence (4) below:

(4) *what* she past do *e*

But sentence (3b), as indicated by the asterisk on the left, fails to undergo a *wh*-movement at the clausal level because the deep structure for sentence (2) differs from what sentence (3b) represents – the derived structure is OK, but the meaning obtained is different from that of the original one. Therefore, grammatically and semantically it is not considered as the underlying structure for sentence (2) above.

From the above discussion, we can see clearly that *wh*-forms as are found in sentence (2) form a group of their own. In the traditional grammar, this category of *what*-forms is treated as relative pronouns, while forms like *what* in sentence (1) are called interrogative pronouns. A semantic analysis of these two types of *wh*-forms will further reinforce the distinction observed here.

As far as meaning is concerned, an interrogative *what* also contrasts with a relative *what*. This is because the former takes up its literal or dictionary meaning and no more than that. On the contrary, the latter is embedded with a set of meanings, and hence, has a meaning complex to be decoded. In other words, there are two meanings being fused into a single *what*-form in the case of the relative *what*. That is why this type of *what* is sometimes termed as "blends" (Halliday, personal communication) and structurally and semantically analyzed as 'the thing(s) which'. For this reason, we label the interrogative *what*-form as isomorphic *what* (i.e., having a single literal meaning only) and the relative *what*-form as dimorphic *what* (i.e., having two meanings fused into a single linguistic entity). An advantage of making such a distinction lies in the fact that, beside the feasibility of categorization, each of them, as will be shown below, represents different degrees of structural and semantical complexity, and consequently will pose separate degrees of learnability for language learners whose

mother tongue, as in the case of Chinese, does not make such a distinction at deep structure. In our discussion below, we will follow this distinction throughout and put forward some techniques for facilitating possible impediments that face language learners at different stages of foreign language learning.

2.1. Isomorphic *what*-clauses

This type of *what*-clauses tends to give some trouble to English learners of Chinese when they begin to take up the language. This is because the structure of English and the structure of Chinese are so different in this respect that each has a highly individualized parameter-setting model (cf. Flynn 1987; Kenstowicz 1985; Bright 1992; Reinhart 1986; Lust – Clifford 1986). In Chinese, a sentence with an interrogative *what* at surface structure shown by (5b) looks more like its English peer at deep structure shown by (6a). Compare sentences (5) and (6) below:

(5)   *ta   chi   shenme?*
       Subj-he   Past-eat Obj-what
       a.   he past eat *what*
       b.   he ate *what*?
             'What did he eat?'
(6)   *What did he eat?*
       a.   he past eat *what*
       b.   *what* did he eat *e*
             ┏━━━━━━━━━━━━┛

Notice that though the Chinese sentence with a *wh*-form is roughly identical with its English peer at deep structure, as is shown by (6b) above, for the same sentence, however, English grammar imposes the obligatory rule of *wh*-movement to move this *what*-form to a sentence/clause-initial position (e.g., as Complementizer) (Chomsky 1970, 1977; Lightfoot 1992). That is why we more often than not hear native speakers of English say *What did he eat?* but less likely *He ate what?* in a formal setting, though the latter variation is possible in some casual speech.

   Noting this difference, we may suggest a rule like (7) below for Chinese-speaking learners of English at the outset of their English learning to monitor their performance concerning isomorphic *what*-clauses.

(7)   Rule for isomorphic *what*-clauses: If you want to produce an isomorphic *what*-clause but don't know where to put your *what*, you can first construe a sentence with the *what*-form in the same position as that in your native language and then move it to the clause-initial position.

Two caveats for Rule (7):

1)   If your want to construe a complex sentence with a *wh*-clause in it, remember to move your *what* to the initial position of the clause (not the complex sentence itself, of which, this *what*-clause is only a part);
2)   If you want to have an interrogative sentence embedded with an isomorphic *what*-form, then you have to first satisfy all other requirements needed for an English question before you can use Rule (7).

   It is assumed that if Rule (7) and its caveats are thoroughly followed out, the possibility for language learners to produce good *what*-sentences will be greatly increased. Rule (7), drawn from our past teaching experience, has been tested in the classroom for a few years and has proved to work quite well for beginners. This can be shown by a comparison of the following paired sentences, of which sentences in (a) are common mistakes made by English learners at the elementary level, while their correct English counterparts are rendered in sentences in (b). It must be pointed out that the original ungrammatical sentences produced by our students were not exactly like what will be given below. For the purpose of illustration, these example sentences have been systematized to some extent, but those features that are of concern to us here are left intact.

(8)   a. **He didn't know she loved **what**.*
       b. *He didn't know **what** she loved.*

(9)   a. *?Did you eat **what**?*
       b. ***What** did you eat?*

(10)   a. *?Will you buy **what**?*
       b. ***What** will you buy?*

(11)   a. **Did he buy it for **who(m)**?*
       b. ***Who(m)** did he buy it for?*

(12)   a. **She recalled the poet was **where** born.*
           (Or, **She recalled the poet was born **where**.*)
       b. *She recalled **where** the poet was born.*

(13)   a. **Will you **when** leave?*
       b. ***When** will you leave?*

(14)   a. **Is their school **where**?*
       b. ***Where** is their school?*

(15)   a. *?Do you want **which**?*
       b. ***Which** do you want?*

(16)   a. *?Did they see **which film**?*
       b. ***Which film** did they see?*

As these paired example sentences show, Rule (7) is general enough to be applied to all *wh*-clauses where *wh*-forms are used either as interrogative pronouns or as interrogative adverbials. For instance, all the problematic sentences in (a) above can be conveniently rewritten as their English counterparts in (b).

2.2. Dimorphic *what*-clauses

As has been stated above, a dimorphic *what*-form is in fact a formal linguistic entity into which two pieces of meanings are fused together. On the other hand, a dimorphic *what*-form always occurs in an embedded clause. More specifically, we may equally say that though it takes a single form and occupies one "slot" at surface structure, it has two deep structural functions to play. This parameter setting model, however, is completely absent from a Chinese *what*-clause. Consequently, these factors make the interpretation of embedded-dimorphic *what*-clauses extremely difficult for English learners of Chinese, not mention the ability to internalize the structure. For example, as sentence (17) below will show, the relative pronoun *what* serves both as the subject of the main clause and also as the object of the attributive clause. These dualistic features of an dimorphic *what*-form more often than not give rise to comprehension problems even for language learners at an intermediate or even advanced level.

(17)   ***What he wrote satisfied his friend.***

Structurally, sentence (17) roughly equals '*The thing(s) which* he wrote satisfied his friend,' and semantically, it can be further re-interpreted as 'The article(s)/book(s)/letter(s) he wrote satisfied his friend.' From the latter, as is indicated by the slashes for semantic interpretation of the *what*-form, we can see clearly that a correct conceptualization of embedded-dimorphic *what*-clauses is frequently highly context-dependent. This structural uniqueness and semantic complexity of the dimorphic *what*-form repeatedly tend to form an inhibition in the classroom for Chinese-speaking learners of English at the intermediate level. A common difficulty facing these language learners is that they often do not know how to structurally and semantically "deconstruct" the complexity of an embedded-dimorphic *what*-clause. This is especially the case when a *what*-clause in question is embedded in such complicated clause complexes as sentences (18) and (19) below indicate, e.g.,

(18)   *In **what** was called Sleeping Valley, there were a lot of fascinating legends.*

(19)   ***What** is checked in the pre-request is **what** is most likely to be the grounds for refusal ...* (Levinson 1983: 358).

An intensive survey of this issue which includes introspective reflections, diagnostic interviews, classroom observations, and problem-solving practices reveals that the difficulties in a correct interpretation of these sentences lie in the fact that

1)   In sentence (18), the *what*-form functions simultaneously both as the object of preposition *in* and as the subject in the attributive clause, which is used to modify its (structurally and semantically "embedded") first part. Structurally speaking, *in what* has the underlying structure of *in the thing(s) which*, and semantically speaking, it is contextually oriented and takes on the meaning of *in the place which*;

2)   In sentence (19), globally speaking, the two *what*-clauses, one as the subject clause, the other as a predicative clause, are merged by a linking verb *is* and both of these *what*-forms are embedded-dimorphic ones and take an underlying structure such as *the thing(s) which*, which needs to be further decoded according to the respective context.

For language learners who have a fundamental mastery of English structure but their proficiency in English has not yet been sophisticated enough to deal with more complex structures, sentences like (18) and (19) above do form a prohibition in their language learning process. Facing this difficult situation, a stratificational model has been developed from our language teaching experiences for Chinese-speaking learners of English to facilitate the process of their internalization of this special structure. The operation of this model, consisting of three successive analysis steps, can be summarized as (20) below:

(20)   A Stratificational Model

Step 1.   Formal Identification: If you have a *what*-form in a clause/sentence, first try to see if the *wh*-form is an isomorphic *what* or a dimorphic *what*. If it is the former, use Rule (7) above; if it is the latter, follow through all the procedures specified in this stratificational model. If you have identified your *wh*-clause as a dimorphic type, move on to Step 2;

Step 2.   Structural Decomposition: Since your *what*-form is dimorphic, you have to analyze it, either in the form of mental reasoning or in the form of paper-and-pencil work, as *the thing(s) which*. You can stop now and go back to your learning task, if you feel that you have already learned the exact meaning of the sentence; otherwise, move on to Step 3 for a contextually semantic re-interpretation;

Step 3. Semantic Re-interpretation: Try to re-interpret the derived structure *the thing(s) which* in the light of the context. In other words, more clues should be drawn from the context to pin down the reference to which the part of *the thing(s)* is contextually tied.

Consequently, a correct interpretation of a structure embedded with a dimorphic *what*-form is based on going through these three steps. For instance, sentence (18) can be analyzed in a way illustrated by (21) below:

(21)   Application of Stratificational Analysis:
        Task Sentence: *In **what** was called as Sleeping Valley, there were a lot of fascinating legends.*

Step 1. Formal Ident.: Grammatically, the *what*-form here occupies both an object position for the preposition *in* and a subject position in the string of *what was called*, therefore, it is an embedded-dimorphic *what*-form;

Step 2. Structural Decomp.: Structurally, an embedded-dimorphic *what*-form can be further analyzed as *the thing(s) which*. By these analyses, we have a rewritten structure as *In the thing(s) which was called as Sleeping Valley, there were ...*

Step 3. Semantic Re-interp.: Contextually and semantically, the *what*-form refers to a geographic location. Basing on this contextual clue, a further semantic analysis will lead to a re-interpretation of the sentence as *In the place which was called as Sleeping Valley, there were ...*

Retrospectively speaking, this stratificational model works pretty well for Chinese-speaking learners of English in general. Meanwhile, it is also felt that it can be further improved. Because one of the inconveniences felt is that, effective as the model is, if an embedded-dimorphic *what*-form occurs in a highly complicated structure, it is extremely difficult, if not impossible, for language learners to structurally see where a *what*-clause begins and where it ends. On the other hand, even if they succeed in working out the structural "puzzle", the whole procedure of decomposition may take much more time than it is needed for a natural processing of this linguistic item in any communicative sense. For instance, this lag in time subsequently forms a big problem in a fast reading task.

With all these problems being taken into account, the question now is not how to interpret an embedded-dimorphic *what*-clause, but rather, to provide a better pedagogical model so that it will be both general and flexible enough for language learners to deal more successfully with linearly or hierarchically complex structures. An integration of useful theoretical implications derived from two linguistic schools, namely, Functional Grammar (Halliday 1985; Butt et al.

1995) and X-Bar Theory in TG Grammar (Chomsky 1970), seems to provide some possibilities for a better solution to the issue. What follows is a manifestation of how the insights which are drawn from these theoretical frameworks can be productively co-operated into our original stratificational model to provide a better rule so that the learning inhibition experienced by Chinese-speaking learners of English in the structure of *what*-clauses will be further attenuated.

3. A Functional-Stratificational Model

As has been specified at the outset of this study, by an integration of two major linguistic theories, a functional-stratificational model is developed first to capture a generalization of the *wh*-form in question and then to facilitate the learning process of this linguistic item in a foreign language learning situation. Below follows a detailed discussion of how this attempt has been achieved.

A functional analysis of *what*-clauses is quite different from what we have already discussed. With some theoretical considerations such as meaning potential and verbal pivot taken into account, the uniqueness of its treatment lies in the fact that in this model an embedded-dimorphic *what*-clause can be regarded as a "functional chunk", rather than a string of separate constituents. As (22) below will show, Butt et al. (1995: 110-111) provide a nice illustration.

(22)   A functional analysis of dimorphic *what*-clauses:
        Task Sentence: [[What the committee has in mind for the next function]] was made plain[1]
        Analysis: Participant Process Attributive

Following this analysis, more example sentences will be given as follows:

(23)   [[What he did]] is [[what he said]]
        Participant Process: relational Participant

(24)   No one believed [[what he said]]
        Sensor Process: mental Phenomenon

Clearly, in Halliday's functional model, separate terms are employed to show semantic differences. For this reason, in sentence (22), Participant is regarded as a position kept for the subject of a clause which takes a verb whose Process is material, while in (23), it is regarded as an element which can either occupy a subject position or a predicative position if there is a relational Process of verb linking the two nominal elements in a structure. On the other hand, since the verb *believed* in (24) indicates a Process quite different both from what is indicated

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[1] Double brackets indicate an embedded clause.

by *was made* in (22), and from what is shown by *is* in (23), so we have Sensor to occupy the subject position and Phenomenon as the object of a mental verb like *believe*. In Functional Grammar, as indicated by sentences (22-24), verbs are further specified to show different processes such as doing, happening, being, and feeling (Halliday 1985; Hu – Zhu – Zhang 1989). Therefore, as is discussed above, if you use a verb to express a material/relational process, then your subject may be regarded as Actor/Participant and your object as Patient/Participant. On the other hand, if you have as your predicate a verb indicating some mental activities, then you will have Sensor to occupy the subject position and the object of the mental verb is called Phenomenon. The reason is that it is believed that different processes are involved in each of the two cases: material vs. mental. From this brief discussion it appears that verbs play an important part in the functional model. It is this fact and the concept of meaning potential that initiate in the present study the assumption that at a very abstract level a given sentence can be analyzed as a dichotomous relation of two linguistic meaning or functional "chunks" which can be manipulated around a pivot formed by the verb of the sentence. This concept underlies the functional part of the model that will soon be introduced below.

A generalization that can be obtained from the functional analysis of *what*-clauses is that in a given sentence there probably exists a more abstract structure which is verb-oriented and everything else is built around the verb pivot of the sentence/clause. More specifically, a highly formalized pattern can be hence developed at an abstract level and then be mapped on the functional analysis of clauses/sentences. This mapping mechanism can be shown as (25) below.

(25)   A Verb-Oriented Mapping-on Relationship:

A	+	B
Participant	Process	Participant
Actor		Patient
Sensor		Phenomenon

In this "A+B" formula, the symbol "+" plays a connective function that can merge any two structurally relevant functional "chunks" together. It must be noted that there are two reasons for us to adopt the term "functional". First, the basic idea behind the rule is inspired by Functional Grammar. Second, so far we have concerned ourselves with a structural and semantic description of *what*-clauses. In fact, an embedded-dimorphic *what*-clause also plays a very important functional role in language use. In its functional sense, a *what*-clause is a cleft-sentence (Levinson 1983: 182-183; Chomsky 1970; Halvorsen 1978). For

instance, sentence (26) below, functionally speaking, roughly equals one of the statements expressed by sentences (27-29) below:

(26)   ***What** he did was correct.*

(27)   *The very action he took was correct.*

(28)   *He did something and the action which he took in doing it was correct.*

(29)   *It was the thing which he did was correct.*

Clearly enough, the embedded-dimorphic type of *what*-clauses implies more than what its surface structure shows. Meaning potential for selection is realized by the speaker for the use of this pattern. Based on this observation, the abstract formula "A+B" can be drawn from sentence (25) above and used as an independent functional rule as (30) below.

(30)   A Functional Rule:
       A + B

In Rule (30), "A" and "B" stand respectively for any linguistic elements which can be, in the sense of structural hierarchy, either as maximal as a clause or as minimal as a phrase/word. As has been stated above, the symbol "+" in Rule (30) plays a very important role in our discussion and, hence, deserves further specification. The basic concept behind this symbol is its "connectiveness". This connective concept is used in such a broad way that it can be referred to different linguistic items which are structurally either overt- or covert-conditioned at different levels of analysis. At the sentential level, it can be used to stand for a conjunction; at the clausal level, it can be employed to refer to any element that may merge two phrases together to form a string of structure, either as a verb to merge the subject of a sentence with its own object (as in cases of transitive verbs), or to merge the subject of a sentence with the verb phrase itself (as in cases of intransitive verbs). An advantage of this rule is that, if necessary, it will be applicable to linguistic analysis at even finer levels. In other words, it is not confined only to a syntactic analysis, but can be expanded to a morphological or a phonological description as well, if necessary conditions are specified.

However, considering possible stylistic variations such as *He said **that** she would come* and *He said she would come* and other structurally covert constraints such as zero modifying positions which are possible for plural common nouns, we have to revise Rule (30) in such a way that its connective function could work more flexibly. For this reason, more is needed to be said about the connectiveness.

The strength for specifying the connective function as being structurally constrained is that it will make the rule more general, flexible and explanatory. For

instance, if the "+" part is structurally specified as obligatory, we can not delete it from a structure for no good reason. On the other hand, if the structure we choose does not need an overt connective of any kind, but only requires a covert connective in its underlying structure, then we must let it be so. Because in the former case, our structure does not need any formally overt connectiveness at all. To meet this requirement, as it will be shown in Rule (31) below, we can conveniently use the bracketing principle and develop a structurally constrained function out of the original connector "+". Here by "bracketing", as it is the case in Chomskyan tradition, we mean optionality. In other words, the element represented by the connector "+" is not always formally necessary, though it may be obligatory at deep structure, or rather, in its underlying sense. Consequently, its realization at surface structure is optional, depending on its conditioning environments such as stylistic variations for a relative pronoun *that* or relevant structural constraints such as zero modifiers for common nouns in plural. Moreover, it can stand for any grammatical element whose function is a kind of "connectiveness" in a very broad sense, namely, you can regard a relational verb as a connector, a transitive verb as another, a conjunction as a third, and an embedded-dimorphic *what*-form as a fourth. A case in point for this statement is that, as the paired sentences in (32) below will indicate, some connectors in English allow to be omitted as the result of register variations. Based on these considerations, it seems sensible if we further revise the functional Rule (30) as Rule (31) below.

(31)   A Revised Functional Rule: A (+) B

The Revised Rule (31) is now both general and flexible enough to stylistic variations and covert structural constraints. For example, in the following paired sentences, all (b)-type sentences in (32) below can be regarded as stylistic derivations of their (a)-type peer sentences because register variations in English allow the deletion of the conjunction *that* represented by "+" in Rule 31.

(32)   Application of Rule (31) for Stylistic Variations:

	A	+	B
a.	*He said*	***that***	*she would come back soon.*
	A	(+)	B
b.	*He said*		*she would come back soon.*

(33)   *She thought **that** he liked it.*

(34)   *She thought he liked it.*

    These paired sentences further justify the validity of Rule (31). Meanwhile, it is also noticed that either Rule (30) or Rule (31) only reveals a syntagmatical description, but not a hierarchical analysis (in the sense that it can not be

paradigmatically applied). If we consider the focus of this study, we will realize that this fact makes their application greatly limited. Because the cutting process suggested by Rule (30) or Rule (31) exists only on a linear dimension. A dilemma we face here is that in wrestling with an embedded-dimorphic *what*-clause we have to continue the binary cutting process on and on until we feel that the products of our analysis are both structurally and semantically clear enough to language learners. It is felt, however, that this problem can be conveniently removed by turning to X-Bar Theory in TG grammar put forward by Chomsky (1970). The basic idea expressed by this theory can be shown by the tree diagram in (35) below.

(35)   An illustration of X-Bar theory:
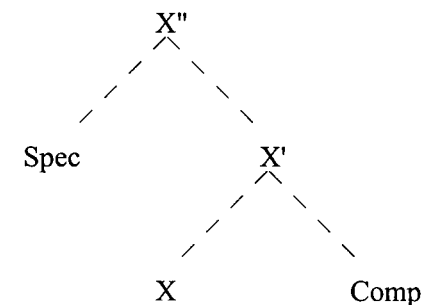
In this diagram, the X" stands for a structure which is hierarchically higher than what is specified at the level of Spec and X' which in turn form another dominant relationship over the structure X and Comp. Following this theory, Rule (31) can be further rewritten as a functional-stratificational rule like Rule (36) below.

(36)   A Functional-Stratificational Rule:
      A^n (+) B^n

The superscript "n" in Rule (36) indicates that, if necessary, this rule can be periodically, or more exactly, hierarchically applied at "n" levels of structural analyses, and that at each level there will be a potential "A (+) B" mapping-on operation which is dominated by the same mechanism just above the current level (e.g., either an operation at a higher level of "A' (+) B'" or an operation at an even more higher level of "A" (+) B"" and so on, depending on the complexity of a given structure). Clearly enough, the very fundamental advantage of this rule is that it will first help an language learner realize that English or any grammar works at two dimensions (linearly and hierarchically), and then enable them to carry on their analyses at these two dimensions. To illustrate this, now let us

have a more complicated example and show how the hierarchical aspect of a structure is predicted by Rule (36).

Since we are talking about embedded-dimorphic *what*-clauses, the complexity of this structure requires a rule that can hierarchically function at different levels of a certain structure, ranging from sentences and clauses to phrases. Considering these factors, we have turned to Chomsky's X Bar theory to rewrite Rule (31) as Rule (36) so that the model will be able to apply hierarchically. From the analysis below, it will be seen that the chunk function developed from Halliday's model is further correlated with the hierarchical concept drawn from the theory of X bar so that the original stratificational model we established in (20) above can be used in a more efficient way. In other words, Rule (36) will start with an analysis at the sentential level, then move on to a description at the clausal level, and finally reach a specification of a given structure at the phrasal level. For instance, the task sentence from Halliday (1985: 58) can be analyzed in the following way.

(37) Application of Rule (33) to Halliday's example:
Task S.: *What the duke gave to my aunt was that teapot.*

A	+	B
What the duke gave to my aunt	*was*	*that tea-pot*

What is here dimorphic and embedded, so it can be further stratificationally decomposed as:

1) At the sentential level the *what*-clause in question is the result projected by Rule (36) at the highest level and hence takes the form "A" + B""";

2) At the clause level this *what*-clause can be further analyzed at two lower levels, namely, at the clausal level and at the decompositional level. We will do the former first and consequently will have the structural form as "A' + B'";

3) At the decompositional level this embedded-dimorphic *what*-clause is further analyzed as 'the thing(s) which ...' and hence has the structure "A + B".

If we map these projected structures on the original sentence, we will have the following results:

At level 1:

A"	+	B"
What the duke gave to may aunt	*was*	*that tea-pot*

At level 2:

A'	+	B'
the thing	*which*	*the duke gave to my aunt was ...*

At level 3:

A	+	B
... which the duke gave		*e to my aunt*

Taking all these together and introducing the revised functional rule into the original stratificational model, we have a functional-stratificational model as Model (38) below to analyze embedded-dimorphic *what*-clauses.

(38) A Functional-Stratificational Model:
Step 1. Formal Identification;
Step 2. Functional Decomposition;
Step 3. Structural Decomposition;
Step 4. Semantic Re-interpretation.

Now let us apply Model (38) to some more sentences.

(39) Application of the Stratificational-Functional Model:
Task S.: ***What** is checked in the pre-request is **what** is most likely to be the grounds for refusal ...*
Step 1. Formal Ident.: Both *what*-elements are embedded-dimorphic, so we have to go on and move to Step 2;
Step 2. Funct. Decomp.: By using the model "A^n (+) B^n" at the sentential level, we have the following results:

1) At the sentential level:

A"	+	B"
What is checked in the pre-request	*is*	*what is most likely to be the grounds for refusal ...*

2) At the clausal level: As 1) above indicates, there are two clauses at this level. So we naturally have Clause (A) and Clause (B) respectively:

Clause A:	A'	+	B'
	what	*is checked in the pre-request*	*is*

Clause B:	A'	+	B'
	what	*is most likely*	*to be the grounds for refusal ...*

Step 3. Str. Decomp.: Since both of *what*-forms are embedded-dimorphic *what*, they can be further rephrased as 'the thing(s) which'

Following this reasoning, we can now replace each of *what*-forms with its structural equivalent.

Clause A:	A	(+)	B
	the thing(s)	*which is checked in the pre-request*	*is*[2]
Clause B:	A	+	B
	the thing(s)	*which is most likely*	*to be the grounds for reusal ...*

After finishing this rewriting task, we can now move to Step 4 for more semantic information:

Step 4. Sem. Re-interp.: The task sentence occurs in a text concerning a pragmatic discussion of meaning, so what is referred to here is most closely connected with the concept of "meaning" or "implicature". Following this contextual clue, *the thing(s)* in each of the rephrased clauses should be reinterpreted as 'the meaning' or 'the implicature'. Hence, the original sentence can be finally understood as:

The meaning/implicature which is checked in the pre-request is the meaning/implicature which is most likely to be the grounds for refusal ...

One more example. For saving space, we will provide a sketchy representation of analysis processes undertaken.

(40)   Task S.: *We eat* **what** *we can and can* **what** *we can not.*
      Step 1. Formal Ident.: Both *what*-forms are embedded-dimorphic;
      Step 2. Funct. Decomp.: By applying "A^n (+) B^n" Model, we will have the following results:

1) At the sentential level:

A"	+	B"
We eat what we can	*and*	*(we) can* **what** *we can not*

2) At the clausal level:
   Clause A:
     Sub-clause 1:

A'	+	B'
we	*eat*	*what we can*

Sub-clause 2:

A	+	B
what we	*can (eat)*	*e*

Clause B:
Sub-clause 1:

A'	+	B'
(we)	*can*	**what** *we can not*

Sub-clause 2:

A	+	B
what *we can not (eat)*		*e*

Step 3. Str. Decomp.: Since both of *what*-forms are embedded-dimorphic, each can be rewritten as *the thing(s) which*. Consequently, we have a decomposed structure as follows:

We eat the thing(s) which we can (eat) and (we) can/tin the thing(s) which we can not (eat).

The last thing for us to do is to put the rewritten sentence into the original context for a semantic re-interpretation. For this, we have to move to Step 4:

Step 4. Sem. Re-interp.: The original sentence is uttered by the owner of a farm in his orchard and the conversation is about how to handle the products of his apple harvest. In the light of these contextual clues, the rewritten sentence can be further semantically re-interpreted as:

We eat apples which we can (eat) and (we) can/tin apples which we can not (eat).

So far the functional-stratificational model seems to have worked pretty well for *what*-clauses. Or rather, it appears to be so at the sentential level of analysis. Next, we will move down and try it at some finer levels of analysis, say, at the phrasal level. Our purpose is to see if the model will be general enough to work at different levels of language analysis. If the model is also shown to be feasible at a lower level of analysis, a further assumption could be made to hypothesize a potential tendency that may exist between the "A^n (+) B^n" model and the general cognitive pattern of human beings. This is especially the case when we notice the fact that calls have been repeatedly made for more integrative work from linguistics and cognitive sciences (Miller 1990). And we will exam the question of how some basic cognitive relationships such as dichotomous categorization and hierarchical stratification are reflected in the feasibility of mapping the correspondent binary cutting process and the paradigmatical analysis on the language structure we have so far examined.

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[2] The sense of connectiveness is covertly implied by the action of selecting the which-clause as an attributive clause itself. Because being an attributive clause in English means that a postmodifying relationship has already been established between the modifier and the modified.

4. A Generalized Structural Model

Considering the focus of the present study, what we present above is only an extremely brief description of the functional and stratificational model of "A^n (+) B^n". But one can feel that the model is general and flexible enough to be applied to different structures as well. In other words, there is a potential for this model to be expanded to describe the structure of a given language as a whole. What follows is partially such an attempt. Let us consider English noun phrases. For this purpose we need to rename Rule (36) as the Generalized Structural Model (hereafter, GSM). Accordingly, this model, as an exact copy of Rule (36) above, is now expanded and used to describe different structures at different levels (hence, taking the name of GSM). A noun phrase in English can be expressed as (41) below.

(41)   NP $\longrightarrow$ A^n (+) B^n
                        x-element   Noun

In (41), an x-element refers to any co-occurrent element which is structurally possible for the head NP. And the symbol "(+)" stands for any necessary grammatical constraints for a given NP to be acceptable. If we have a common noun as part B, the connector "+" will select an element which will be both semantically and syntactically suitable for the determiner position (or, slot) and the result of this selection is realized as part A. More specifically, if we choose a noun in part B in its plural form, then as "(+)" indicates, we may have two choices for part A, namely, either a covert zero modifier or an overt attributive modifier. The role of "(+)" is to "watch" if in each selection necessary structural conditions are satisfied. Noticing these features, we may say that an English NP is regressively conditioned in the sense that the NP head itself determines what modifiers to be put before it, covertly or overtly.

It is also noted that an NP can be occasionally postmodified. In this situation, the head of the NP in question will take the position of "A" in Rule (41) and part B will be reserved for potential postmodifiers of any type, ranging from a phrasal postmodifier to a clausal postmodifier. This fact further validates the general dichotomous relationship existing between human cognition and language structure specified above. In other words, what is important in GSM is not the filled substance in each of these slots, but the entailed relationship of dichotomy.

Similarly, for an English verb phrase, we may have a structure like (42) below.

(42)   VP $\longrightarrow$ A^n (+) B^n
                        Verb   NP

As is well known, there are two types or usage of verbs in English, i.e. transitive and intransitive. If we have a verb in its intransitive usage, then the "(+)" part in (42) will suggest that part B should be dropped to guarantee a grammatical structure. Otherwise, as in the case of a transitive verb, we must have an NP to occupy part B, functioning as the object of the verb in question. In this sense, we regard the division of transitive and intransitive verbs as different usage rather than separate kinds (cf. Jespersen 1949; Erades 1975; Quirk et al. 1985; Yang 1996). Another fact we notice from such an analysis is that English VPs are progressively constrained and hence different from their NP peers, which, on the other hand, take an opposite directionality of governing mechanism.

For an English adjective phrase, we have a description like (43) below.

(43)   AP $\longrightarrow$ A^n (+) B^n
                        Intensifier   Adjective

In this structure, the connector "(+)" again serves as a "doorkeeper" to see if an adjective phrase will need any modifying element such as an intensifier or modifier to be structurally or semantically necessary and possible. In a sense, this selection of "(+)" is both a matter of structural choice and a matter of meaning selection. Like an NP, an AP is also regressively conditioned in English.
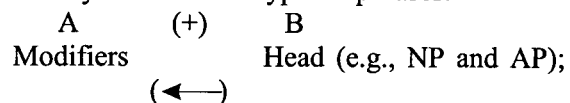
Lastly, for an English prepositional phrase, we have the following description like (44) below.

(44)   PP $\longrightarrow$ A^n + B^n
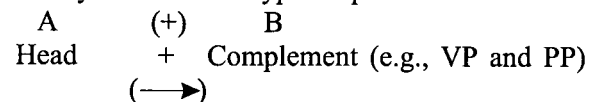   Preposition   NP

For a PP, the connective part is obligatory at deep structure to merge the preposition and its object. This connectiveness is, however, achieved by the underlying grammatical constraint of a PP in English, rather than by any overt formal element at all. And this structural condition, as we have seen in the case of a transitive verb, states that after a preposition we must have an NP as its object or complement. Directionally speaking, it can be also added that a PP in English follows the same pattern of a VP and is progressively conditioned.

From the above discussion, we observe some generalizational aspects of English phrase structures. According to the directionality of constraints, there are two major types of phrases in English: one is regressively conditioned (as in cases of NPs and APs), the other is progressively constrained (as in cases of VPs and PPs). This observation partially explains why it is usually claimed that a PP is more like VP, because beside other things, their constraint directionality is identical. And these generalizations can be described as (45) and (46) below.

(45) a regressively conditioned type of phrases:

       A   (+)   B
       Modifiers   Head (e.g., NP and AP);
                (◄——)

(46) a progressively conditioned type of phrases:

       A   (+)   B
       Head   +   Complement (e.g., VP and PP)
                (——►)

Needless to say, considering the focus of this study and the space limitation, what we have discussed in this part is only a partial demonstration of some possible derivations obtained from applying Rule (36) at the phrasal level. This, however, does not mean that this rule is only good for analyzing phrases. As partially illustrated above, it is also applicable at the syntactical level. And our discussion of *what*-clauses provides some evidence to the validity of this claim.

More importantly, it is felt that some very general cognitive mechanisms (e.g., dichotomization and hierarchicality) and their realization in language (e.g., the linearly dichotomous relationship between two relevant linguistic items and the underlying stratificational dominance at different levels) are revealed by the application of this rule (cf. Aitchison 1993). In addition, it is also believed that this analytic model will be applicable if it is used in morphological and phonological analyses. Because what buttresses the model is the fact that cognitively there exists a binary relationship between an object A and an object B and this relationship, if functioning linearly, may be regarded as the representation of the most basic and primary type of cognitive categorization. On the other hand, if it functions hierarchically, this relationship may indicate a selection from a constellation of more subtle and sophisticated variations in a given category. As far as language is concerned, these cognitive activities sometimes work relationally (e.g., in a linear way to show different relationships of linguistic forms available) and sometimes stratificationally (e.g., in a hierarchical way to indicate selections of linguistic structures and meanings available). In most cases, the functions at these two dimensions may be interwoven and take place simultaneously. A case in point is that when being applied to the analysis of language structure, as is shown by our discussion above, this meta-rule appears to reveal some very fundamental schema that may highly likely exist between the mechanism of our mental grammar and the structure of our language. The reason for this assumption, however, is far from clear and much more effort is needed to testify and validate this correlation (cf. Yang 1997a).

5. Conclusion

What has been presented above is an initial and tentative attempt to apply what has been gained from different linguistic theories to facilitate the process of language learning for Chinese-speaking learners of English. An underlying difficulty lies in the fact that linguistic theories are mostly incompatible with each other, philosophically or methodologically. However, as the present study shows, if the challenge is fully realized and reasonably handled, it is still worth trying (cf. Newmeyer 1982; Edge 1993; O'Neil 1987).

Meanwhile, it is also observed that the practitioners of the language teaching field have never stopped trying things theoretically innovative. The reason for this perseverance is only too explicit: in this domain, there has long been a tradition for practitioners to try everything that will do more good than harm to their students. This eclectic theory may trace back to some classic works published at the beginning of the century (Sweet 1926 [1964]; Palmer 1921 [1964]). And this philosophy has recently gained some new momentum (Girard 1986; Prabhu 1990; Yang 1995). Behind this attempt is a well-recognized dilemma: on the one hand, we know so little about language structures in different cultures and about learning behaviors of human beings, and on the other hand, foreign or second language learning itself is a particularly demanding subject.

Following this argument, the present study, can be regarded as a worthy attempt to encourage language teachers to "consume" linguistic theories available and take an eclectic position in their teaching activities. If these can be attained in a satisfactory way, it is not impossible for specialists of the field, as this study has shown, to take one more step further and to become an active producer of classroom-oriented theories. Or rather, as Cochran-Smith and Lytle rightly put it (1990: 6), "The unique feature of questions that prompt teacher research is that they emanate solely neither from theory nor from practice, but from the critical reflection on the intersection of the two" (quoted by Lensmire in his letter to Smith (1997: 292-293)). Needless to say, theories developed from the classroom may open a new avenue both for linguists and language teachers to learn more about linguistic structures of different languages and about learning behaviors in a universal sense.

REFERENCES

Aitchison, Jean
    1993   "Birds, bees, and switches: Psycholinguistic issues 1967-2107", *ELT Journal* 47, 2: 107-116.
Bright, William
    1992   *International encyclopedia of linguistics*. Oxford: OUP.
Brown, Roger
    1968   "The development of *wh*-questions in child speech", *Journal of Verbal Learning and Verbal Behavior* 7: 279-290.

Butt, David – Rhondda Fahey – Sue Spinks – Colin Yallop
    1995   *Using functional grammar: An explorer's guide.* Sydney: National Center for English Language Teaching and Research.
Chomsky, Noam
    1970   "Remarks on nominalization", in Roderick A. Jacobs – Peter S. Rosenbaum (eds.), 184-221.
    1977   "On *wh*-movement", in: Peter W. Culicover – Thomas Wasow – Adrian Akmajian (eds.), 71-132.
Cochran-Smith, Marilyn – Susan L. Lytle
    1990   "Research on teaching and teacher education: The issues that divide", *Educational Researcher* 19, 2: 2-11.
Culicover, Peter W. – Thomas Wasow – Adrian Akmajian (eds.)
    1977   *Formal syntax.* New York: Academic Press.
Edge, Julian
    1993   "The dance of Shiva and the linguistics of relativities", *Applied Linguistics* 14, 1: 43-55.
Erades, P. A.
    1975   *Points of Modern English syntax: Contributions to English studies.* (Edited by N. J. Robat.) Amsterdam: Swets & Zeitlinger.
Flynn, Suzanne
    1987   *Parameter setting model of L2 acquisition.* Dordrecht: D. Reidel.
Girard, Denis
    1986   "The eclectic way", *English Teaching Forum* 24, 3: 11-14.
Halliday, Michael A. K.
    1985   *An introduction to functional grammar.* London: Edward Arnold.
Halvorsen, Per-Kristian
    1978   *The syntax and semantics of cleft-construction.* (Texas Linguistic Forum 11.) Austin: University of Texas.
Hu, Zhuanglin – Zhu Yongshen – Zhang Delu (eds.)
    1989   *A survey of systemic-functional grammar.* Hunan: Hunan Educational Press.
Jacobs, Roderick A. – Peter S. Rosenbaum (eds.)
    1970   *Readings in English transformational grammar.* Walthem, Mass.: Ginn.
Jespersen, Otto
    1949   *A Modern English grammar.* London: George Allen & Unwin.
Kenstowicz, Michael
    1985   "The phonology and syntax of *wh*-expressions in Tangale", *Studies in the Linguistic Science* 15, 2: 79-92.
Levinson, Stephen C.
    1983   *Pragmatics.* London: CUP.
Lightfoot, David
    1992   "Government: The long and short of it", *Journal of Linguistics* 28, 1: 185-197.
Lust, Barbara (ed.)
    1986   *Studies in the acquisition of anaphora.* Vol. I. Dordrecht: D. Reidel.
Lust, Barbara – Terri Clifford
    1986   "The 3D study: Effects of depth, distance and directionality on children's acquisition of anaphora", in: Barbara Lust (ed.), 203-243.
Miller, George
    1990   "Linguists, psychologists, and the cognitive science", *Language* 66, 2: 317-322.
Newmeyer, Frederick J.
    1980   *Linguistic theory in America: The first quarter-century of transformational generative grammar.* New York: Academic Press.
    1982   "On the applicability of TG grammar", *Applied Linguistics* 2: 90-120.

O'Neil, Wayne
    1987   "Preface", in: Suzanne Flynn, xiii-xvii.
Palmer, Harold E.
    1921   *The principles of language study.* London: G. G. Harrap & Company.
    [1964] [Reprinted London: OUP.]
Prabhu, N.S.
    1990   "There is no best method – why?", *TESOL Quarterly* 24, 2: 161-176.
Quirk, Randolph – Sidney Greenbaum – Geoffrey Leech – Jan Svartvik
    1985   *A comprehensive grammar of the English language.* London: Longman.
Ravem, Roar
    1974   "The development of *wh*-questions in first and second language learners", in: Jack C. Richards (ed.), 134-155.
Reinhart, Tanya
    1986   "Center and periphery in the grammar of anaphora", in: Barbara Lust (ed.), 123-150.
Richards, Jack C. (ed.)
    1974   *Error analysis: Perspective on Second Language acquisition.* London: Longman.
Smith, Michael W. – Peter Smagorinsky
    1997   "Editors' introduction: Guidelines for contributors to *Research in the Teaching of English*", *Research in the Teaching of English* 31, 3: 285-294.
Sweet, Henry
    1926   *The practical study of languages: A guide for teachers and learners.* London: Dent.
    [1964] [Reprinted London: OUP.]
Yang, Yonglin
    1995   "Trends in the teaching of writing", *Language Learning Journal* 12: 71-74.
    1996   "A categorization of the transition of English verbs", *Journal of the Northwest Normal University (Social Science)* 33, 6: 85-90.
    1997a   "A formulation of metaphorical *in/out of* phrases", *Journal of English Linguistics* 25, 1: 50-58.
    1997b   An experimental research of the color codability of Chinese from a sociolinguistic perspective – with a particular reference to normal university English majors. [Unpublished Ph.D. dissertation, Peking University.]