FROM JAPANESE TO ENGLISH

AN ERROR PREDICTION BASED
ON
A TRANSFORMATIONAL TRANSFER GRAMMAR MODEL

by Wesley Richard

With the emergence of transformational generative grammar a new dimen-
sion in contrasting two languages has been added. Transformational grammar
permits generalizations about language processes which have become known as
"linguistic universals." This concept allows for the possibility that even though
two languages may be completely different in appearance, yet at some level there
may be similarities between them. Assuming the existence of universals at
some level of the language process, it is conceivable that in the process of learn-
ing a second language there may be transfer from the native language(NL) to the
target language(TL). Further, it may be possible to formulate rules which
describe or define this process. And if such rules can be formulated, then it may
be possible to use them as a measurement of complexity. The purpose of this
paper is to explore the possibility of the existence of a "transfer grammar"
which may underlie the process of learning a second language, specifically when
the NL is Japanese and the TL is English. Investigation will center around
the interrogative construction in particular, concluding with a complexity
measurement proposal.

A principle of interference in language learning has been assumed in many
linguistic studies. Lado[1], in a general statement, Fries[2] with respect to syntax,
and others in studies of phonology[3] have given evidence that the characteristics
of one's native language can transfer to his use of the target language.

> Interference can facilitate learning a foreign language when the particular elements
> transferred do not structure differently than the corresponding elements in the foreign

language- this is called positive interference. But when the transferred elements do not structure the same as the corresponding foreign elements... the transference is a hindrance- and we then have what is called *negative* interference.[4]

How negative interference affects a Japanese learner of English can be demonstrated by Ney's error analysis. Many errors were found in the omission of the plural morpheme.[5] This is understandable in light of the fact that no such morpheme exists with common nouns in Japanese.

Exactly how to give recognition to the principle of interference in determining pedagogical procedures is not immediately clear. Saporta suggests that "the optimal pedagogical grammar for a given target language is determined in part by the native language of the prospective learner.[6]

To what extent is a pedagogical grammar determined by the native language? Robert Stockwell, in his unpublished contrastive analysis of English and Tagalog, states that complete transformational grammars of the two languages would provide an "ideal basis" for preparing second language teaching materials. By comparing the components of each grammar, drills could be constructed "to help the student internalize each kernel type and each transformational rule that was not already familiar to him from his own language"[7]

Another proposal was outlined in a paper given at the annual meeting of the Linguistic Society of America by Borkowski and Micklesen. Here the authors state that two types of rules would be contained in a·contrastive generative grammar :(1) those common to the two... languages involved and (2) those peculiar to but one of the languages.[8]

There is yet another alternative called "syntactic translation" used in machine translation. Wayne Tosh delineates the three steps involved in this process:

Step 1. Recognition of text in the source language.

Step 2. Transference of the resulting structure into the target language.

Step 3. Synthesis of expressions in the target language.[9]

For purposes of this study, these steps will be interpreted as follows:

Step 1. Recognition. Kernel sentences in Japanese will be generated from

the Base Component rules.

Step 2. Transference. The items at the lexical level will be chosen from both Japanese and English lexicons according to the node specifications in the tree, thus setting up an "interlinguistic tree."

Step 3. Synthesis. Transform rules will provide the proper structure for the English sentence, thus completing the process of syntactic translation.

Machine translation works backwards from an existing string to its deep structure. The proposal in this study is that we work from a Base Component of Japanese to generate strings that can result 1) in kernel Japanese sentences if proper lexical and transformation rules are applied, or 2) in kernel English sentences by applying English lexical rules and the proper transformations.

The rules involved in Step 3 will of necessity be ordered to attain some degree of generality. Each rule will handle only one process, i. e. permutation and deletion will not occur in the same rule. This restriction will permit a more precise measurement of complexity. The number of rules it takes to perform Step 3 will indicate the degree of complexity, with respect to the native language, of the particular structure under consideration.

GRAMMAR

Japanese Base Component

Sketched below is a base component for Japanese, followed by explanatory notes.

* Sentence *

1. S ⟶ Subject + VP

2. Subjeect ⟶ NP + SM

3. VP ⟶ (Time) (Place) MV

4. MV ⟶ $\left\{ \begin{array}{c} CP \\ Vb \end{array} \right\}$ Mod

5. CP ⟶ Pred + Vc

6. Pred ⟶ $\left\{ \begin{array}{c} Adj \\ NP \end{array} \right\}$

7. $\text{Vb} \longrightarrow \left\{ \begin{array}{l} \text{Object} + \text{Vt} \\ \text{Vi} \end{array} \right\}$

8. $\text{Object} \longrightarrow \text{NP} + \text{OM}$

9. $\text{Aux} \longrightarrow (\text{Neg}) \, \text{Tns} \, (\text{QM})$

10. $\text{Place} \longrightarrow \text{NP} + \text{PM}$

11. $\text{Time} \longrightarrow \left\{ \begin{array}{l} \text{Tim} \\ \text{NP} + \text{TM} \end{array} \right\}$

12. $\text{NP} \longrightarrow \text{Det} \left\{ \begin{array}{l} \text{N} \\ \text{PRO} \end{array} \right\}$

13. $\text{Det} \longrightarrow (\text{wh-}) \left\{ \begin{array}{l} \text{Def} \\ \text{Indef} \end{array} \right\}$

14. $\text{Tns} \longrightarrow \left\{ \begin{array}{l} \text{Pres} \\ \text{Past} \end{array} \right\}$

Explanatory Notes

1. Reasons for positing a *Subject* node are given below (rule 2).

2. SM refers to the Subject Marker *wa* or *ga*. Special conditions, which need not concern us here, determine which is used.[10] Since SM is more clearly related to NP than to VP, the Subject node is introduced to show that relationship as well as to make manipulation of elements more convenient.[11] Not all Japanese sentences contain NP + SM but those that do not can be viewed as the result of a deletion transformation.

3. In the translation process, these elements will need to be permuted to align with English order. These constituents are expanded later in the rules.

4. CP refers to Copulative Phrase, which, for our purposes, means the "Be" verb. Vb is a node which dominates both transitive and intransitive phrases. *Mod* is a constituent patterned after the Fillmore model though not so complete because of the skeletal nature o f this base component.[12]

5. Vc will be supplied in a morphophonemic rule because of its dependence upon tense and degree of formality in Japanese and upon tense and number in English.

6. NP in the Predicate does not have a marker following it.

7. The Object constituent always precedes the verb in Japanese.

8. The motivation for an Object node is to indicate the relationship of NP to OM, a relationship analogous to that of NP to SM.

9. Neg is nearly always *nai*.

Tns will only be read as Pres in the examples. Past could easily be included but since its presence would not influence the results in any way, there is no point in complicating the data unnecessarily.

QM triggers the attachment of the *ka* particle to sentences to indicate that the sentence is a question.

10. Place is expressed in phrases with an attaching PM (Place Marker): *e*, *ni*, *de*. PM seems to attach logically to NP which is dominated by Place. The shape of PM can then be specified by a context rule.

11. Tim is used for constituents that do not have an attached Time Marker (*kyō* — today, *ima* — now). TM can be used in expressions of time: *kuji ni* (at nine o'clock).

12. Positing a PRO form provides explanation for certain indefinite expressions:

> *nanika*   (something)
> *dareka*   (someone)

The morphophonemic result is dependent upon determiner specification.

13. The status of the Japanese Determiner seems a bit unclear. There are at least definite determiners including demonstratives and numbers. If Determiner is a language universal as Fillmore suggests,[13] then indefinite determiners may perhaps bestbe represented as $\emptyset$. There is a particle *aru* (not the verb) that could be construed as an indefinite determiner:

> *kare wa sono hon o yomu*   (he reads that book)
> *kare wa aru hon o yomu*   (he reads a / some book)

But the precise qualities of this particle are not known. It may be possible to relate it to a PRO determiner in the sense of "some man" or "some people."

Wh- is aligned with the determiner. Choosing both QM and wh- results in a wh- question. QM without the wh- option results in a yes / no question. The cooice of wh- without the QM would result in a relative clause, but the necessary apparatus for that option is not included in this grammar.

The motivation for attaching wh- to the determiner node is that it fits the description outlined by Katz and Postal for English and it appears to work for Japanese as well.

> Wh- questions contain classes two distinguished by the difference between definite (the) and indefinite (a/some) articles. The single-word question forms who, what, where, when, why, how fall into the indefinite group.[14]

The single-word question determiner 'which' would fall into the definite category. The following inter-linguistic paradigm indicates some of these determiner relationships, based on the Katz and Postal scheme. The lower line in each case represents the English equivalent.

TABLE 1.

Inter-linguistic wh- relationships

nani : what	± QM		+ QM
Def + N	*sono hon* that book	wh- wh-	*sono hon* ⇨ *dono hon* that book ⇨ which book
Indef + N	⌀ *hon* some book	wh-	⌀ *hon* ⇨ *nanno hon* some book ⇨ what book
Def + PRO	*sono koto* that thing	wh-	*sono koto* ⇨ *dono koto* that thing ⇨ which thing
Indef + PRO	*nanika* something	wh-	*nanika* ⇨ *nani* something ⇨*what thing⇨ what

The same type of relationship obtains in the case of other wh- words as well :
dare (who), *doko* (where), and *itsu* (when).

14. Examples will be given in the Present tense although Past, of course, is an option. The copulative *da* is a bit troublesome as an example because of its social status. Formal speech would require *desu*. However, in order to be consistent, in that all verbs used here are informal, *da* will be used in CP constructions.

In the yes / no question (Copulative) informal usage deletes the copula.

kare wa sensei da ka   (Is he a teacher ?)

kare wa sensei ka   (Is he a teacher ?)

Thus in CP questions, *da* will be represented by ϕ.

English Base Component

An English base component has been included to point up the possibility that using a common base component for English and Japanese may not be unique at all.

It will be observed that the base rules for Japanese differ from those of English in only two respects. First, there is a difference in sequence of elements. This difference, however, is not very significant if the "common assumption" that Fillmore cites is valid:

> ... the universal base specifies the needed syntactic relations but the assignment of sequential order to the constituents of base structure is language specific.[15]

Rules for assigning sequential order are a necessary part of the grammar in any case for certain types of constructions, including interrogatives for English.

There are, secondly, two grammatical categories marked in Japanese structure which English does not have marked (Subject and Object). In English, except for prepositions, sentential relationships are shown by word order in surface structure.

The man ate rice.

But not: Rice ate the man.

But in Japanese "relations between words are often shown by... particles.[16]

otoko wa gohan o tabeta
man SM rice OM ate   (A man ate rice.)

gohan o otoko wa tabeta

There are, in English, some instances of an Object Marker influencing the shape of certain words:

he + OM = him.

The suggestion is, therefore, that at some level of structure these two languages may be very similar and, in fact, both could make use of the same base component.

This close correlation of Base Rules is important because of the current

interest in language universals. Perhaps Chomsky best states the broad implications of such a correlation.

> It seems to be true that the underlying deep structures vary, very slightly, at most, from language to language.[17]

It Chomsky is correct, then it is probably true that "close to the problem of language universals is that of transfer grammars because the more we know about language universals, the simpler our description of transfer grammars will be."[18]

A limited example such as we have here with Japanese and English may not go far in showing the universality of base rules, but their close correspondence is certainly not without significance. If they are as similar as this study suggests, the shape of kernel structures depends heavily upon transformation rules.

English Base Component Rules

1. $S \longrightarrow NP + VP$

2. $VP \longrightarrow MV \ (Place) \ (Time)$

3. $MV \longrightarrow Mod \ \left\{ \begin{array}{c} CP \\ Vb \end{array} \right\}$

4. $CP \longrightarrow Vc + Pred$

5. $Pred \longrightarrow \left\{ \begin{array}{c} Adj \\ NP \end{array} \right\}$

6. $Vb \longrightarrow \left\{ \begin{array}{c} Vt \\ Vi \end{array} \right\} + NP$

7. $Mod \longrightarrow (QM) \ (Neg) \ Tns$

8. $Place \longrightarrow PM + NP$

9. $Time \longrightarrow \left\{ \begin{array}{c} Tim \\ Tm + NP \end{array} \right\}$

10. $NP \longrightarrow Det \ \left\{ \begin{array}{c} N \\ PRO \end{array} \right\}$

11. $Det \longrightarrow (wh\text{-}) \ \left\{ \begin{array}{c} Def \\ Indef \end{array} \right\}$

12. $Tns \longrightarrow \left\{ \begin{array}{c} Pres \\ Past \end{array} \right\}$

Transformations

The transformation rules below are designed to transform the result of base component derivation into an English structure. Most of the rules are permutation rules. Some of these rules would apply for questions even if the English counterpart to the Japanese Base Component were used, e. g. Do attachment, wh- permutation. Others were necessary due to the sequential features specified in the Japanese component.

To produce a final string in Japanese from these rules, few transformations would be required. A QM transformation rule would insert *ka* for all questions. And a morphophonemic rule would specify the proper form for wh- questions:

T   Question: $X + QM \Rightarrow X + ka$

T   wh- :   wh- $+ Det + N \Rightarrow dono + N$

$$wh- \begin{bmatrix} nanika \\ dareka \\ dokoka \\ itsuka \end{bmatrix} \Rightarrow \begin{bmatrix} nani \\ dare \\ doko \\ itsu \end{bmatrix}$$

It is already evident that English questions are considerably more complex than Japanese questions from a transformational point of view. To get a more precise notion of the degree of complexity, it will be necessary to examine the transformation rules in detail.

Rules

T 1. *Place Permutation*

$$W - Place - Y \Rightarrow W + Y - Place$$

(Place $\not\Rightarrow$ wh-)

T 2. *Time Permutation*

$$W - Time - Y \Rightarrow W + Y - Time$$

(Time $\not\Rightarrow$ wh-)

T 3. *Neg Permutation*

$$W - Neg + Tns - Y \Rightarrow W - Tns + Neg - Y$$

T 4. *Pred, Object Permutation*

$$X \begin{bmatrix} \text{Object} \\ \text{Pred} \end{bmatrix} \begin{bmatrix} \text{Vt} \\ \text{Vc} \end{bmatrix} \text{Mod} + Z \Rightarrow X \begin{bmatrix} \text{Vt} \\ \text{Vc} \end{bmatrix} \text{Mod} \begin{bmatrix} \text{Object} \\ \text{Pred} \end{bmatrix} Z$$

(Object, Pred $\not\Rightarrow$ wh-)

T 5. *Do Attachment*

$$W - Vb + Tns \left\{ \begin{array}{c} QM \\ Neg \end{array} \right\} Y \Rightarrow W - Vb + Do + Tns \left\{ \begin{array}{c} QM \\ Neg \end{array} \right\} Y$$

$(S \neq [\text{wh-X} + SM - \underset{\text{Subject}}{Z} - Tns + QM])$

T 6. *Wh- Permutation*

$$W - \text{wh-X} - Y \Rightarrow \text{wh-X} \quad W + Y \left\{ \text{wh-X} = \begin{array}{c} \text{Pred} \\ \text{Time} \\ \text{Place} \\ \text{Object} \end{array} \right\}$$

T 7. *(Wh-) QM*

$$([\text{wh-X}]) Y - Ba + W - Z \Rightarrow ([\text{wh-X}]) Ba + W - Y - Z$$

$$\left(\text{wh-X} = \left\{ \begin{array}{l} \text{Object} \\ \text{Pred} \\ \text{Place} \\ \text{Time} \\ \text{Subject} \end{array} \right\} \right)$$

$(W = Tns(Neg)QM)$
$(Ba = Do, Vc)$
$(Y \neq \phi)$

T 8. *Mod Permutation*

Subject $+ Y + $ Mod $+ Z \Rightarrow$ Subject $+ $ Mod $+ Y + Z$

$(\text{Mod} = Do + Tns + Neg)$

T 9. *Marker Permutation*

A. $X - NP \left\{ \begin{array}{c} TM \\ PM \end{array} \right\} - Y \Rightarrow X \left\{ \begin{array}{c} TM \\ PM \end{array} \right\} NP - Y$

B. $X \begin{bmatrix} PM \\ TM \end{bmatrix} Y \Rightarrow X + Y \begin{bmatrix} (PM) \\ \phi \end{bmatrix}$ $(X = \text{wh- Indef} + PRO)$

T10. *Wh- Specification*

Refer to Table 1.

T 11. *Marker Deletion*

$$\phi + X \left\{ \begin{array}{c} SM \\ OM \\ QM \end{array} \right\} \Rightarrow X$$

T 12. *Tense Specification*

    A. $\left\{ \begin{array}{c} Vi \\ Vt \end{array} \right\} Pres \Rightarrow \left\{ \begin{array}{c} Vi \\ Vt \end{array} \right\} s$

    B. $Vc + Pres \Rightarrow is$

    C. $Do + Pres \Rightarrow does$

T 13. *Contraction*

    A. $does + not \Rightarrow doesn't$

    B. $is + not \Rightarrow isn't$

Explanatory Remarks

T 1. *Place Permutation.* Since *Place* is found after MV in English instead of before as in Japanese sequence, a rule is necessary to permute Place and MV. The restriction on membership is necessary because *where* will be positioned at the front of the sentence when it occurs.
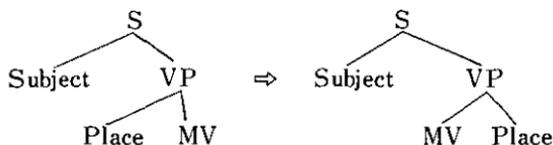
T 2. *Time Permutation.* In Japanese, Time precedes Place when both occur. Since Time follows Place in English, our rule must not only move Time and Place to the right of MV but also permute Time to the right of Place.

                      T 1.   *T 2.*
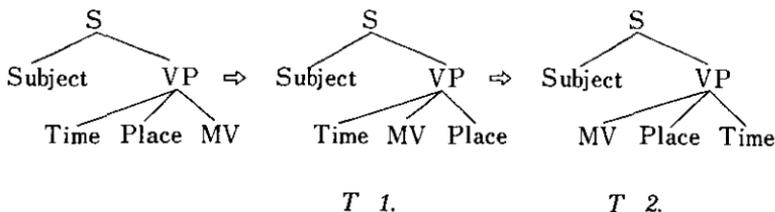
T 3. *Neg Permutation.* Tense is attached following Neg in Japanese. For English, then, Neg needs to be permuted beyond Tns because Tns attaches to the verb or to Do.
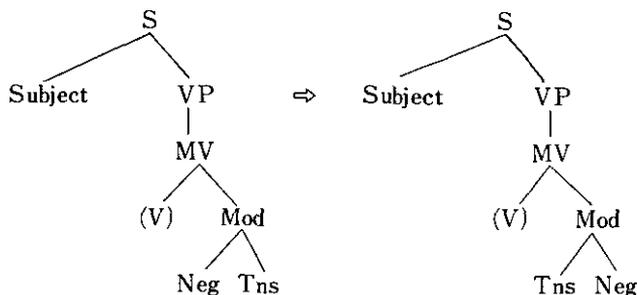
T 4. *Pred, Object Permutation.* Both the predicate and direct object precede the verb in Japanese. This rule permutes both. This rule does not apply if either the object or predicate is being questioned since a later rule brings the wh- phrase forward. The motivation for this restriction is to preserve as much of the structure of the native language as possible.

T 5. *Do Attachment.* Sentences with transitive and intransitive phrases (Vb) which contain the negative marker and / or QM have *Do* preceding Tns. There is no equivalent component in Japanese structure. This rule simply attaches *Do* to the Mod node.
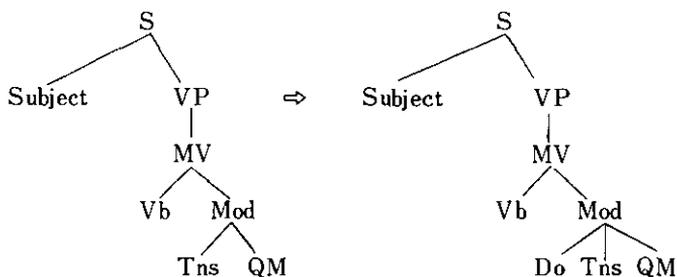
A peculiar condition is attached to this rule. The reason for it is that non-negative questions which have wh- as a constituent of Subject do not employ

Do.

Non-negative: Who eats lunch?

Negative: Who does not eat lunch?

If we were to remove this restriction, the string would later have to undergo a deletion transformation which would influence the complexity measurement unnecessarily.

T 6. *Wh- Permutation.* Wh- questions in Japanese retain the same sequential relationships as declaratives. The wh- phrase does not move to any other part of the sentence. In English, however, except for a questioned Subject, the wh- moves forward. The nodes Time, Place, and Object carry their accompanying markers with them. Pred has no marker.
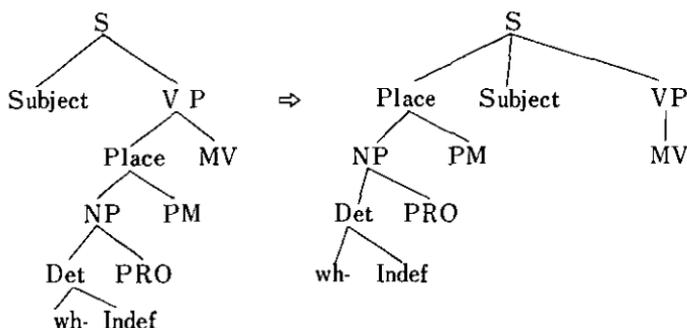
T 7. *Wh- QM Permutation.* All questions, except those with identical structure in Japanese, would need to go through this permutation. This rule provides for the placement of the *Ba Tns (Neg) QM* (where Ba = Base) segment of Mod immediately after the wh- phrase if it occurs, or if it does not occur, this segment permutes to the front of the sentence. If our corpus included modals and other auxiliaries, Ba(Base) would need to be expanded.

The following correlations indicate how this rule is to be applied. The wh- morphophonemic rule has not yet been applied but to facilitate the charting of these forms, they will be represented in their usual morphophonemic shape.

$$([wh\text{-}X]) \quad X - Ba + W - Z \Rightarrow ([wh\text{-}X]) \quad Ba + W - Y + Z$$

heSM isPresQM a boy	isPresQM heSM a boy

what   heSM isPresQM ϕ what   isPresQM heSM ϕ
         heSM doPresNotQM walk   doPresNotQM heSMwalk
whoSM   walk   doPresNotQM ϕ whoSM doPresNotQM walk ϕ
wherePM heSMwalk doPresQM ϕ wherePM doPresQM heSMwalk ϕ

T   8. *Mod Permutation.* All the sentence types under consideration have been provided for except the Negative Declarative sentence, which contains *do.* This rule places Mod immediately after the Subject. One could have an early general rule to permute Mod for all sentence types but a later affix-switching rule would then be necessary. In an attempt to preserve native language structure, therefore, Mod is shifted only in the case of negatives. If modals or other auxiliaries were included, those elements would be attached to this rule, too.

T   9. *Marker Permutation.* The particles in Place and Time construc-tions follow the NP with which they occur in Japanese. In English these particles precede a Place or Time NP. This inversion rule simply pre-positions the particle. If both Place and Time are present, this rule will need to apply twice.

Sub-rule B is necessary to take care and Place and Time particles in wh-questions (Indefinite type). In wh-Time questions the particle usually drops. Stylistic differences would have to be permitted in a broader context than this. Thus we get:

When does he eat?

but not: When does he eat at?

On the other hand, with wh-Place structures we get:

Where does he eat?

And in some dialects: Where does he eat at?

T 10. *Wh- Specification.* Because of the detail necessary for this rule it will not be formulated here. Its formulation is given in Table 1 (page 6) as a pattern. Other wh-words could well be a part of this rule including "whom" which would require the presence of Object Marker to specify its morpho-phonemic shape. The other markers, although present, would not influence the. shape of wh-.

T 11. *Marker Deletion.* This rule deletes all remaining markers which do not take a morphophonemic shape in English.

T 12. *Tense Specification.* The purpose of the tense rule is to indicate the morphophonemic shape of the Tense Marker. Actually this rule is over-simplified and serves only as a sample rule since Number in the Subject node is not included. All sentences are singular in this study. Any broader representation would need to account for the agreement of Tns and Number.

T 13. *Contraction.* Contraction of *Do* and *is* is necessary in most speech situations that do not contain emphatic stress.

Analysis

Using the procedures outlined above, an anylysis of a limited corpus was undertaken. Since a generative grammar permits only dec larative structures if obligatory rules are followed, it seemed appropriate to begin at that point. Furthermore, by beginning with declarative structures, it is possible to determine which complexities are inherent in a given structure type, thus providing a standard by which to compare interrogative constructions. Moving from the declarative constructions into interrogatives, a hierarchy of complexity was thus established. After demonstrating the basic methodology with reference to three simple types of constructions, the remainder of the paper will emphasize results rather than the process of analysis.

Copulative. Sketched below is an inter-linguistic tree of a simple copulative sentence. The tree is constructed from Japanese rules to the point where lexical items can be supplied. In parallel with the Japanese words are English equivalents to which transform rules will later be applied. At the application of the first rule, the Japanese lexicon is dropped.
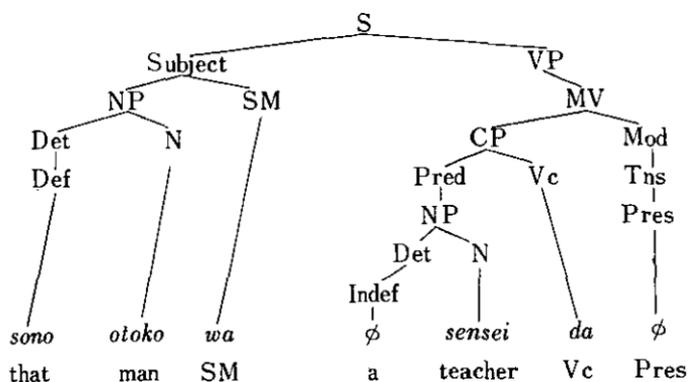
To transform this structure into an English one, the *Pred, Object Permutation*(T4) must be applied. Its application results in the following configuration.
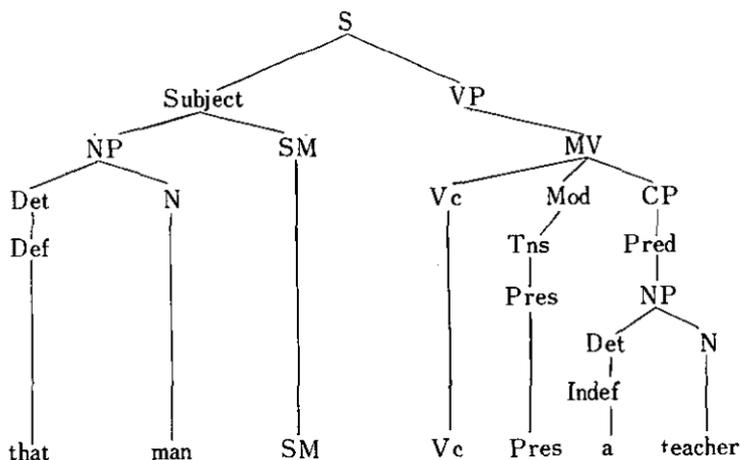
Only two other rules apply. One is the *Marker Deletion* rule (T11) resulting in:

      that   man   Vc   Pres   a   teacher.

The other rule is a morphophonemic one taking the properties of Vc and Tns (as well as number of the preceding NP in a more complete grammar) to produce *is* (T12). The string

that   man   is   a   teacher

is thus derived using three rules, two of which apply in every derivation.

Intransitive.   The least complex structure possible would be one in which only these last two rules apply. Such a structure can be found in sentences which employ intransitive verds.

dareka	*ga*	*aruku*	ϕ
PRO	SM	Vi	Tns
someone	ϕ	walk	s

This type of structure will obviously rate lowest in the hierarchy ofcomplexity since it correlates so well in its structure with the native language.

Transitive.   Transitive sentences have added structure because of the verb-object relationship.
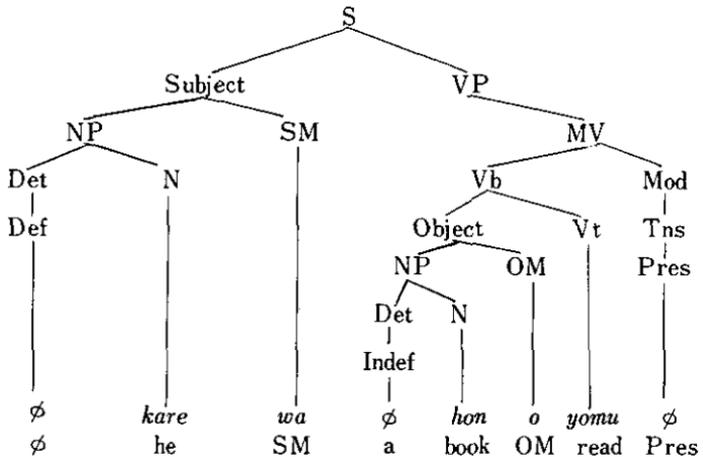
Applying the *Pred, Object Permutation* rule (T4) positions the object for English:

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                                    S
                    Subject                      VP
            NP              SM                        MV
        Det     N                           Vt    Mod      Vb
        Def                                       Tns    Object
                                                  Pres     NP      ON
                                                        Det   N
                                                        Indef
        φ       he          SM              read  Pres  a    book  OM
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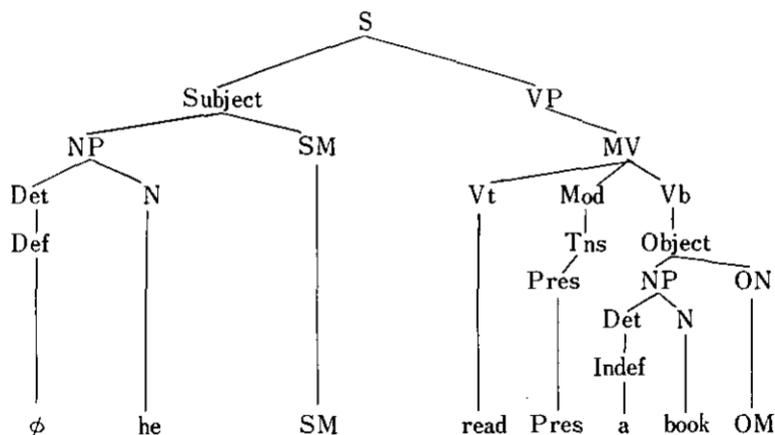
Applying the final two rules we get:

  T 11: he read Pres a book.

  T 12: he reads a book.

  Using these simple constructions as a basis, complex structures(Place and Time elements), Yes−No and Wh- Interrogatives, and Negative structures for all these constructions were investigated. The following chart summarizes the findings for all types of constructions investigated.

TABLE 2

Construction Complexity

		Copulative			Intransitive			Transitive		
		Simple	Place or Time	Place and Time	Simple	Place or Time	Place and Time	Simple	Place or Time	Place and Time
Declarative		3	5	7	2	4	6	3	5	7
Neg Declarative		5	7	9	6	8	10	7	9	11
yes / No		4	6	8	4	6	8	5	7	9
Neg Yes / No		6	8	10	6	8	10	7	9	11
Wh·	Subject	4	6	8	3	5	7	4	6	8
	Obj / Pred	5						6	8	10
	Time / Place		7			7			8	
Neg Wh·	Subject	6	8	10	7	9	11	8	10	12
	Obj / Pred	7						8	10	12
	Time / Place		9			9			10	

CONCLUSION

Having now analyzed two main types of interrogatives, Yes—No and Wh-, what conclusions can we draw concerning the complexity of these types in relation to non-native speakers of English in Japan? Following are some summary statements regarding the structures investigated in this study.

1. In general, declative constructions are less complex than their interrogative counterparts. It takes fewer rules to generate

He walks. (2 rules) than either:

Who walks ? (3 rules) or

Does he walk ? (4 rules).

2. The addition of a Place or Time constituent, except when that con-stituent has a wh- attached to it, always increases the complexity of a con-struction by the same number of rules(two).

He eats rice. (3 rules)

He eats rice at noon. (5 rules)

3. Constructions with Vt are always more complex than analogous struc-tures containing Vi, but the presence of Vc does not result in a clear pattern or comparison.

4. The presence of the Neg constituent does not complicate a structure in a uniform pattern but it does add considerable complexity to the construction. This complexity can be accounted for by the Do insertion rule in Vb construc-tions and the necessity of both a Tns-Neg permutation rule and a contraction rule for all negative construction

A negative yes / no question is more complex than a non-negative one.

Does he walk ? (4 rules)

Doesn't he walk ? (6 rules)

But a negative wh-question is, comparatively, even more complex than its non-negative counterpart.

Who walks ? (3 rules)

Who doesn't walk? (7 rules)

5. Wh- questions are not always more complex than yes / no questions. In fact, in some cases the complexity of yes / no questions exceed that of wh-questions.

Does he sleep ? (4 rules)

Who sleeps ? (3 rules)

6. The complexity of wh- questions is dependent upon which element in the construction is being questioned. A questioned Subject is the least complex wh- construction while a questioned Object or Predicate results in greater complexity.

The following hierarchial tree indicates the relationships of complexity

mentioned in the summary statements. Complexity is greatest at the upper level of the table. It does not account for sentences with both Time and Place as constituents. The symbols are those represented in the rules, e. g. P/T Vc indicates a copulative phrase with Place or Time constituents:S Vi means that the Subject of an intransitive phrase is questioned.   The numbers at the left indicate the number of rules necessary to translate the structure into English syntax.

Table 5. Hierarchical Tree of Complexity

	Declarative Non-neg	Declarative Neg	Yes/No Non-Neg	Yes/No Neg	Wh- Non-Neg	Wh- Neg
10						S P/T Vt O P/T Vt P/T Vt
9	P/T Vt		P/T Vt			P/T Vc P/T Vi
8	P/T Vi		P/T Vc P/T Vi		O P/T Vt P/T Vt	S P/T Vc S Vt O Vt
7		P/T Vc Vt	P/T Vt	Vt	P/T Vc P/T Vi	S Vi Pred Vc
6		Vi	P/T Vc P/T Vi	Vc Vi	S P/T Vc S P/T Vt O Vt	S Vc
5	P/T Vc P/T Vt	Vc	Vt		Pred Vc S P/T Vi	
4	P/T Vi		Vi Vc		S Vc S Vt	
3	Vt Vc				S Vi	
2	Vi					

KEY: Vc = Copulative Phrase
Vi = Intransitive Phrase
Vt = Transitive Phrase
P = Place constituent
T = Time constituent

S = Subject
O = Object
Pred = Predicate

Testing

The assumption in this analysis is that any given structure will be difficult for the Japanese learner of English to the degree that it is complex as represented by the hierarchical tree. This correlation of *complexity* with *difficulty* amounts to a prediction of error. Such a prediction not only identifies the structures where interference will likely occur, it also predicts, relatively, to what degree such interference will be present.

Thus a given structure can be rated on a scale between the poles of "positive interference" and "negative interference." The quantifier is the number of rules required to translate that construction. A high correlation can be expected between errors made and the number of rules required for a particular construction.

The predictive capacity of this type of contrastive analysis effectively eliminates the criticism that "contrastive studies themselves do not provide any means for quantifying the amount of difficulty encountered."[19] In addition, this type of analysis has ready explanations for the predicted degree of complexity.

But such predictions must, in some way, be verified to prove the credibliity of the theory. The results in this paper have not been tested. However, some guidelines for such testing will be proposed.

Verification for predictions of this nature can often be provided by error analysis. Error analyses, however, have two inherent weaknesses: 1) they cannot account for structures which are avoided because of their complexity, and 2) only certain types of constructions will appear for analysis. Thus error analyses of particular sentence types are difficult to obtain.

Predictions based on this study would need to be worked out in terms of multiples on a comparative basis. For example, using the two rule construction (the simplest possible) as a base, a construction that required four rules may be be found to be in error two times as often as that of a two rule construction, or some other progressive correlation may obtain.

The number used for comparison would need to be equalized by the ratio of frequency of occurrence. To compare two constructions (A and B) where A occurred five times and B ten times, one would need to multiply A by two in order to get a comparable score.

An error analysis of "gathered data" leaves too much to accidental utterance. Since it is difficult to obtain production in any systematic way, would it be feasible to test reception of particular constructions ? Such a test would consist of a set constructions of the types discussed in this paper. These sentences could be given to two groups of students who had the same amount of training in English. To group A the sentences would be given in written Japanese and the task would be to translate them into English. Group B would receive the sentences aurally and would be requested to write as much of the sentence as possible immediately after hearing it. Or if writing is judged too great a handicap, results could be received for both groups on a tape recording.

The rationale for having two groups with differing tasks is to make certain that errors are a result of the problem being tested rather than of the method.

If the number of errors is found to correlate with the degree of complexity as predicted in this study, we can safely conclude 1) that the methodology here proposed has validity, and 2) that the translation rules employed have been properly formulated. Error in the rule formulation would not disprove the validity of the method.

FOOTNOTES

1
Robert Lado, *Linguistics Across Cultures* (Ann Arbor, 1957).

2
Charles C. Fries and Agnes C. Fries, *Foundations for English Teaching* 11—12 (Tokyo, 1961).

3
John J. Nissel, *Analysis of the Predictable Patterns of Error in English among Native Speakers of Japanese* (Unpublished Georgetown University M. S. dissertation, Washington D. C., 1959).

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4

Andreas and Olympia Koutsoudas, "A Contrastive Analysis of the Segmental
Phonemes of Greek and English" *Language Learning* 12.212 (1962)

5

James Walter Ney, *A Morphological and Syntactic Analysis of English*
Compositions Written by Native Speakers of Japanese
(Ann Arbor, Ph. D. Thesis, 1963).

6

Sol Saporta, "Review of Robert Lado's *Language Teaching :*
A Scientific Approach," Language 41.549 (1965).

7

William Orr Dingwall,   "Transformational Generative Grammar and Contrastive
Analysis," *Language Learning* 14.147 (1964).

8

G. Borkowski and L. Micklesen, "A Contrastive Study of the Impersonal
Sentences of Polish and Russian," Paper presented at the Annual Meeting of the
Linguistic Society of America, 1963. Quoted in Dingwal 147.

9

Wayne Tosh, Syntactic Translation 9 (The Hague, 1965).

10

The function of the two particles *wa* and *ga* has been explained in various ways.
W. P. Lehman, *A Grammar of Formal Written Japanese* 78 (Cambridge,
Mass. 1951) sees *wa* as pointing out the "logical subject" and *ga* as indicating the
the grammatical subject.
Samuel E. Martin, *Essential Japanese* 44 (Rutland, Vermont 1954)
says "*wa* sets off the topic" of the sentence.   Charles Fillmore uses similar
terminology. *Wa* is assigned the status of "secondary topicalization" while *ga*
represents "primary topicalization." "The Case for Case" *Universals in*
Linguistic Theory 65 (New York 1968).

11

This is neither to confirm nor to deny Fillmore's contention that *Subject* is seen
as a surface-structure phenomnon but to simply point out that at some level this
relationship exists.

12

Op. Cit. Fillmore 23.

13

Ibid. 67.

14

Jerrold J. Katz and Paul M. Postal, *An Intergrated Theory of Linguistic*
Descriptions 91 (Cambridge, Mass. 1964).
Matsuo Soga's formulation of wh- concurs with mine. He states that WH forms

are "derived from" WH determiner" plus noun." *Some Syntactic Rules of Modern Colloquial Japanese Speech* 283 (Indiana University, 1966).

15

Op. Cit. Fillmore 1.

16

Op. Cit. Martin 44.

17

Noam Chomsky, " The General Properties of Languege," Brain *Mechanisms Underlying Speech and Language* 80 – 81, Frederic L. Darley, Editor (New York, 1967).

In *Aspects of the Theory of Syntax* 117, (Cambridge, Mass. 1965) Chomsky asserts that it is not "unlikely that... much of the structure of the base is common to all languages."

18

Irena Bellert, "Four Types of Nominalizations in an English-Polish Transfer Grammar," *Transformations and Discourse Analysis Papers* 62.1 (University of Pennsylvania, 1966).

19

Ney 2.

BIBLIOGRAPHY

Bellert, Irena. "Four Types of Nominalizations in an English-Polish Transfer Grammar," *Transformations and Discourse Analysis Papers,* University of Pennsylvania (1966).

Bolinger, Dwight L. "Interrogative Structures of American English," *American Dialect Society* 28, University of Alabama Press (1957).

Chomsky, Noam. *Aspects of the Theory of Syntax.* Cambridge, Massachusetts, The M. I. T. Press (1965).

—————————· "The General Properties of Language," *Brain Mechanisms Underlying Speech and Language.* Frederic L. Darley, Editor, 73—81, New York, Grune and Stratton, (1967).

Dingwall, Willam Orr. "Transformational Generative Grammar and Contrastive Analysis," *Language Learning* 14.147—160 (1964).

Fillmore, Charles. "The Case for Case," *Universals in Linguistic Theory.* Edited by Emmon Bach and Robert T. Harms, New York, Holt, Rinehart and Winston, Inc.(1968).

Fries, Charles C. and Agnes C. *Foundations for English Teaching.* Tokyo, Kenkyusha Ltd (1961).

Hashimoto, Mituo. *From Japanese to English: A Contrastive Analysis Based on a*

Transformational Model. Georgetown University Ph. D. Thesis, Washington D. C. (1965).

Isami, Y. "On NP wa NP ga Predicate Constructions in Japanese,"
Quarterly Progress Report 73.173—179 (1964).

Jinushi, Toshiko Susuki. "The Structure of Japanese." *Studies in Linguistics.*
Occasional Papers 11, George L. Trager, Editor, Dallas, Texas (1967).

Katz, Jerrold J. and Postal, Paul M. *An Interrated Theory of Linguistic
Descriptions.* Research Monograph No.26, Cambridge, Massachusetts, The
The M. I. T. Press (1964).

Klima, Edward. "Negation in English," *The Structure of Langguage : Readings in the
Philosophy of Language.* J. A. Fodor and J. J. Katz, Editors, 246—323.
Englewood Cliffs, New Jersey, Prentice-Hall, Inc. (1964).

Koutsoudas, Andreas and Olympia. "A Contrastive Analysis of the Segmental Phonemes of
Greek and English," *Language Learning* 12. 211—230 (1962).

Lado, Robert. *Language Teaching : A Scientific Approach.*
New York, McGraw-Hill, Inc. (1964).

Lehman, Winfred P. *A Grammar of Formal Written Japanese.*
Cambridge, Massachusetts, Harvard University Press (1951).

Martin, Samuel E. *Essential Japanese.*
Charles E. Tuttle Co., Rutland, Vermont (1954).

Miller, Roy Andrew. *The Japanese Language.*
Chicago, the University Of Chicago Press (1967).

Nagara, Susumu and Iseri, Naomi A. "A List of Publications in English and Other Western
Western Languages Specially designed for use by Students in Japanese Linguistics
and by Teachers of Japanese as a Second Language." Unpublished bibliography,
Ann Arbor, University of Michigan (August 1, 1967).

Ney, James Walter. *A Morphological and Syntactic Analysis of English
Compositions Written by Native Speakersof Japanese.*
University of Michigan Ph. D. Thesis (1963).

Nissel, John Joseph. *Analysis of the Predictable Patterns of Error in English
Among Native Speakers of Japanese.*
Unpublished Georgetown University M. S. dissertation, Washington D. C. (1959).

Saporta, Sol. Review of Lado, Robert. *Language Teaching : A Scientific Approach.*
Language 41. 547—51 (1965).

Smith, Richard E. *A Transformational Sketch of Japanese.*
University of Texas M. A. Thesis (1962).

Soga, Matsuo. *Some Syntactic Rules of Modern Colloquial Japanese.*

Indiana University Ph. D. Dissertation (1968).

Tosh, Wayne. *Syntactic Translation.*
    The Hague, Mouton and Co. (1965).

1. I want *him to go.*
2. I believe *him to be honest.*
3. I forced *him to go.*
4. I told *him to go.*

But they can be given different analyses in terms of their preceding verbs.

First, the author surveys the views on this problem of two traditional grammarians--- O. Jespersen and R. W. Zandvoort--- and a transformational-generative grammarian, P. S. Rosenbaum. Then, by assigning tentative different deep structures to these constructions, he tries to classify into four classes the verbs which can take accusative with infinitive constructions.

Prospero — his fatherly love
Shozo TAKAHASHI

This essay, as the second essay following the first essay 'Ariel and Caliban in *The Tempest*', aims to make clear Prospero's fatherly love toward his daughter Miranda. There are four aspects; Miranda as a treasure, Fair encounter and Prospero's test to Ferdinand, Prospero's ethic and warning about life, and Prospero's pathos as a father. Through thinking upon these aspects some imagination will occur in our minds that Shakespeare, as one who had two daughters, may have been such a father.

From Japanese to English: An Error Prediction Based on a Transformational Model.
Wesley RICHARD

The question of how to predict language interference in a second language learning situation has long been debated. With the emergence of transformational grammar it has become possible to formulate grammatical rules of the two languages in question in order to make comparisons. It appears to be possible to construct a base grammar, incidently common to both languages, from which transfer rules can be used to get from a Native Language Base to a Target Language surface structure. By calculating the number of rules required to get from a structure in the native language to a similar structure

in the target language, the complexity of that structure can be measured. In the case of English and Japanese, such an analysis of certain structures indicates that a negative sentence is more complex than a non-negative, that interrogatives are more complex than declaratives, and that the complexity of the WH- question form is dependent upon the element in the sentence being questioned.

The Social Work of Salvation Army in Japan and Gumpei Yamamuro

Akira MIYOSHI

It is known that Gumpei Yamamuro, an excellent organizer of Salvation Army in Japan, succeedingly adopted the new policies for social work in Japan. We can easily find that some of them could be carried out only by the Army. At the same time it should be worthy of notice that the fulfilment of the Army's social work was led by Yamamuro's love for mankind as well as his originality for the work.

Casework and Counselling (II)

Yoshihiro OHTA

- On Unification and Characteristics of Casework and Counselling -

In Casework and Counselling (I) I did mainly the comparative study of casework, counselling and psychotherapy. Here I try to point out the characteristics of casework with reference to Richmond's viewpoint as the background and its evaluation. The characteristcs of casework is studied through one actual case for the purpose of emphasizing this new viewpoint.