研究論文

Subjects and Verbal Inflections in SLA: In Defence of "Full Transfer / Limited Access" Model [1)]

第二言語習得における主語と動詞屈折の分析：完全言語転移・*UG* アクセス制限説の擁護

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第二言語習得における普遍文法の役割に関する研究は、1995年にチョムスキーよってミニマリスト・プログラムが提唱されて以来、もっぱら機能範疇に属する素性の習得可能性に焦点を当てるようになった。その一例として、若林（1997, 2002a）の、日本人とスペイン人による、英語の時制節の主語に関わる素性の習得に関する研究があげられる。その中で、若林は、扱ったデータが完全言語転移説では説明がつかないとし、それに代わる説として語彙転移·語彙習得（Lexical Transfer / Lexical Learning）説を提案した。このモデルによれば、第二言語で必要な素性は、母語の心的辞書から第二言語のそれへの転移と、白紙状態から学習する二つのプロセスをとおして行われ、後者のプロセスにおいては、可視統語（overt syntax）レベルで併合される素性から習得が始められるということである。さらに、若林は、日本人が英語の主語を習得する場合では、母語からの転移は起こらず、比較的早期に学習可能であると主張した。

本研究では、英語習熟度の異なる日本人100人から収集した、英語の時制·非時制節に存在する主語と動詞屈折の習得データを分析した。この結果からは、若林が主張する習得順序パターンは認められなかった上、母語に存在するトピック構造の転移が観察された。これを基に、本研究は、Tsimpli らの提唱する完全言語転移· UG アクセス制限 (Full Transfer / Limited Access) 説を支持する。さらに、言語転移のメカニズムについて考察する。

キーワード

ミニマリストプログラム（Minimalist Program）、第二言語習得理論（Second Language Acquisition Theory）、言語転移（Transfer）、日本人英語学習者（Japanese Learners of English）、主語（Subject）

1. Introduction

Within the generative framework, various accounts have been proposed in order to give an explanation for grammatical phenomena in SLA. Amongst them are the 'Minimal Trees' hypothesis by

Vainikka & Young-Scholten（1994, 1996a, 1996b），the ‘Weak Transfer’ theory by Eubank（1993/94, 1994a, 1996），the ‘Full Transfer → Full Access’ model by Schwartz & Sprouse（1994, 1996），and the ‘Full Transfer / Limited Access’ account by Tsimpli & Roussou（1991）and Tsimpli & Smith（1991）. The validity of these models has been examined and questioned over the years. A recent criticism comes from Wakabayashi（2002a），which studies the acquisition of non-null subjects in English by Japanese and Spanish speakers, crucially relying on the Minimalist framework proposed by Chomsky（1995）. He argues that the data analysed in his study cannot be accounted for by any of the above theories, including the ‘Full Transfer / Limited Access’ model, which assumes that the initial state of L2 grammar consists of L1 syntactic properties, and that parameter-resetting is virtually impossible. The model regards SLA as a process where learners “misanalyse” a surface structure of a target language, by associating L1 features with L2 morphophonological forms, which implies that the syntactic representation built through this process is the same as that of their L1. Wakabayashi agrees with the view that transfer takes place in SLA but disagrees with the claim that no parameter-resetting takes place. He proposes a theory called the ‘Lexical Transfer / Lexical Learning’ model and argues that this is able to provide a plausible account for his interlanguage data. According to the model, SLA is carried out mainly by two processes: lexical feature learning triggered by PF/overt cues, and feature transfer from one lexicon to another.

The present paper, investigating the acquisition of features involving subjects in English by Japanese speakers, attempts to show that the research findings can be plausibly explained in terms of L1 transfer rather than acquisition of new features. The study also contributes to better understanding of the term, *transfer*.

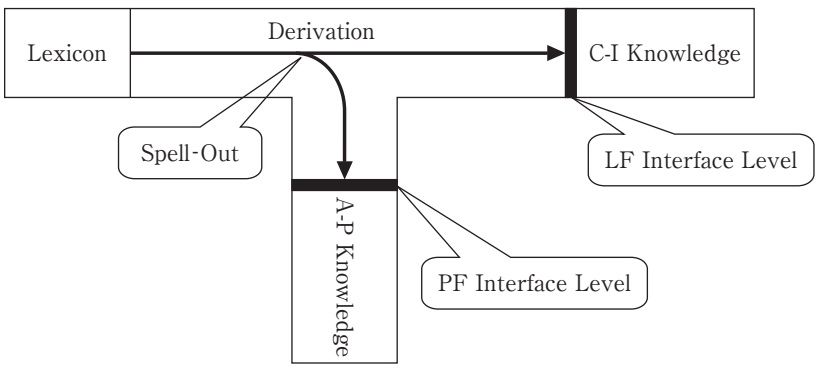
The organisation of the paper is as follows: In section 2, the relevant theoretical backgrounds are described. It begins with an outline of the syntactic framework proposed by Chomsky（1995）. This is followed by a description of the theory developed by Wakabayashi（1997, 2002a），which accounts for the parametric differences between English and Japanese, focusing on the derivation of subjects in the respective languages. Then, two acquisition models are introduced: Wakabayashi’s SLA theory called the ‘Lexical Transfer / Lexical Learning’ model, and Hoekstra et al.’s L1 acquisition theory, which offers an account for the acquisition pattern of relevant structures, observed in the data of L1 acquirers of English. The rationale behind taking L1 acquisition into consideration, as well as testing the validity of Wakabayashi’s SLA model, is to see whether our research data would show a consistent pattern with that of L1 acquisition, which is assumed to be carried out by acquiring a set of features required by the target language. It is possible that L2 acquisition still takes place via feature learning, conforming not to the model suggested by Wakabayashi but to the pattern observed in L1 acquisition. After the theoretical assumptions are introduced, our empirical study is presented in section 3. This includes the syntactic

theory we adopted, specific research questions, methodology, and results of the experiment. The results are discussed in section 4, and a conclusion is drawn in section 5. The paper is rounded off with some implications for a theory of transfer, with particular reference to Selinker（1992, 1996）.

2. Theoretical Background

2.1. The Minimalist Program（*Chomsky 1995*）

Wakabayashi（2002a）adopts the Minimalist Program（MP）as his theoretical framework. It regards linguistic knowledge as a computational system, and the system is strictly derivational. The derivation starts from the Lexicon and ends at LF, and somewhere in the process a syntactic object is sent to PF（*spell-out*）. In the lexicon, all the lexical items[2)] needed to form a syntactic object become associated with formal/grammatical features. Those features can be categorised into either [+ interpretable] or [− interpretable]. Then, those bundles of features are put into an array（*Numeration*）. The computational system takes this array of lexical items from the lexicon. These lexical items or syntactic categories merge together in a pair-wise fashion to form a larger constituent（*Merger*）. At the same time, the grammatical features give rise to a chain of mapping operations（*Checking*）, whose purpose is to eliminate all but the interpretable features in the PF- and LF- levels respectively. Feature checking may be carried out by overt / covert movement（*Move / Attract*）. All the strong features and phonological features, which trigger Move, are eliminated before the point of Spell-Out, and the syntactic object is sent to the PF level. On the other hand, the rest of the [− interpretable] features, i.e. features without semantic contents, are eliminated, and the configuration which only contains the [+ interpretable] features converges at the LF level. These operations are subject to the Principle of Procrastinate, which requires them to take place after Spell-Out unless there is such a feature that urges overt movement. These are schematically presented in figure 1 :



Note : A-P knowledge = articulatory-perceptual
C-I knowledge = conceptual-intentional

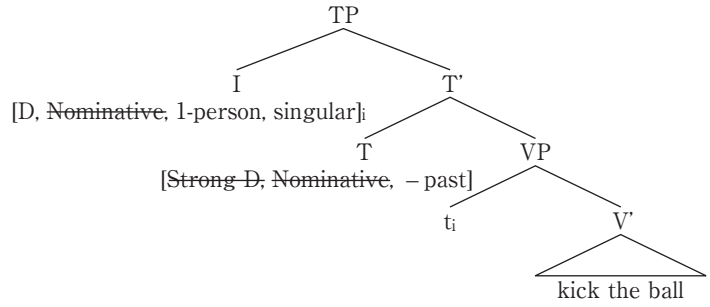
Figure 1. Mechanism of Syntactic Derivation

2.2. A Theory of Parametric Differences between English and Japanese Subjects (*Wakabayashi 1997, 2002a*)

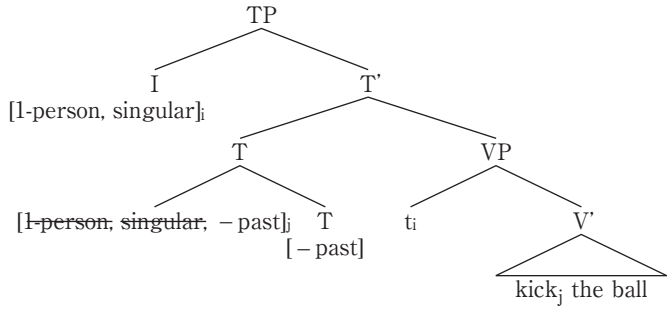
Based on the above framework, Wakabayashi proposes an account for parametric differences between English, Spanish and Japanese subjects; only the theories on English and Japanese are presented here. Assuming that derivation takes place in a bottom-up manner, VP is formed at some point, and then in English, T merges with VP. English T possesses the strong D feature and Nominative case, both of which are considered to be [− interpretable]. The [strong D] of T, which needs to be checked and deleted in overt syntax, attracts the categorial feature of DP in the [Spec VP]. This induces the movement of the whole constituent of [D, first-person, singular, Nominative] to the [Spec, TP]. Checking operations take place between T and its specifier DP, which result in the erasure of the [Strong D] feature of T, and the [Nominative] features of T and DP. In covert syntax, the tense and Φ - features of the verb are attracted to T. The Φ-features of V, being [− interpretable], are checked by those of the DP in [Spec, TP] and erased. The series of these processes are schematically presented below:

(1) a. *I kick the ball.*.

b. Operations in Overt Syntax



c. Operations in Covert Syntax

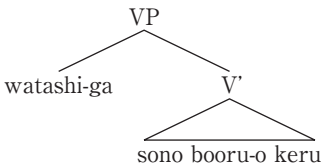


In Japanese, on the other hand, an over subject noun phrase, if it is selected from the lexicon, merges as the Spec of VP in overt syntax, and then T merges with VP in covert syntax. These processes are schematically presented below:

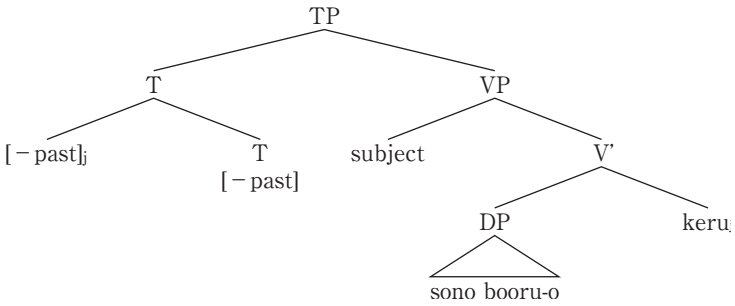
（2）a.（watashi-ga）sono booru-o keru.

（I）　　that　ball-acc kick-pres

b. Operations in Overt Syntax



c. Operations in Covert Syntax



Thus, the difference between English and Japanese subjects is explained in terms of whether T merges in overt syntax and whether it has a strong D feature: English T merges in overt syntax and has a strong D feature, whereas Japanese T neither merges in overt syntax nor has a strong D feature.

2.3. The 'Feature Transfer / Feature Learning' Model（*Wakabayashi 1997, 2000a*）

Assuming that cross-linguistic differences are attributed to the differences in feature specifications, Wakabayashi puts forward an SLA model where L2 learners use the same computational system available for their native language, but have to build a lexicon based on the input. The latter is carried out either by transferring features from their L1 lexicon or by learning new features from scratch. This process of feature learning is initiated by a PF-effect, by which Wakabayashi means the features that require the lexical item to merge in overt syntax are acquired earlier than those that require the lexical item to merge in covert syntax. Learners also have to learn which items to include in the numeration and which features to associate with which lexical items. This predicts that 'only when the lexical item is included in the numeration does L1 transfer emerge（p.99）'. This accounts for the fact that learners do not exhibit the properties of their L1 during the very early stage of SLA. Referring to the results of his study, he concludes that in the case of the acquisition of overt subjects in English by Japanese speakers, learning of the strong D feature of T takes place without L1 transfer.

2.4. L1 Acquisition Studies on Null Subjects and Finiteness

Null subjects are also a well-discussed issue in first language acquisition. It has been reported that there is a stage during which children omit determiners and subject pronouns. This also coincides with the omission of inflectional morphology. An explanation for this correlation between null subjects and root infinitives is offered, for example, by Hoekstra et al.（1995, 1999）. They suggest that the property which those two phenomena have in common is the semantic notion of ‘specificity’: verbal morphology expresses temporal specificity, whilst definite determiners and pronouns mark specific DPs.

However, there is a great deal of evidence that children have the knowledge of Spec-head agreement: Hoekstra et al. show, citing several studies, that children use agreeing forms of verbs with a high degree of accuracy, and that children produce the agreeing form of the same verb immediately after producing a root infinitive. They further present the results of Gerken & McIntosh（1993）, which indicates that children seem to know both the presence of a functional position preceding nouns and what the content of the position should be.

Taking the two observations together, Hoekstra et al. claim that what is lacking in children’s sentences is ‘finiteness’, the grammatical encoding of specificity. According to them, there is a temporal / deictic operator in the C domain that binds verb. They consider the morphosyntactic realization of the chain linking those two elements as finiteness. The same applies to D and noun. The morphosyntactic realization varies from a language to a language; in the case of English, it is Number that is realised. Hoekstra et al. claim that it is the underspecification of Number that makes the chain invisible; hence the lack of finiteness. This is reflected in early grammar as a correlation between null subjects（or determinerless nouns）and root infinitives.

3. Study

3.1. Syntactic Assumptions on English and Japanese Subjects and a Related Issue

Following Wakabayashi（2002a）and Fukui（1986/1995a, 1995b）, we assume that English possesses the strong D feature and Nominative Case in T, and Φ-features in V, whereas Japanese possesses none of them. Therefore, in English, an overt subject is raised from [Spec, VP] to [Spec, IP] in order to check off the strong D feature and Nominative case in T. Whereas in Japanese, an overt subject is placed in [Spec, VP] and is given the Nominative case marker -*ga*, as a result of merger with a V’. In the case of Japanese, however, a finite clause does not need to have an overt subject; the clause is allowed to have a null subject.

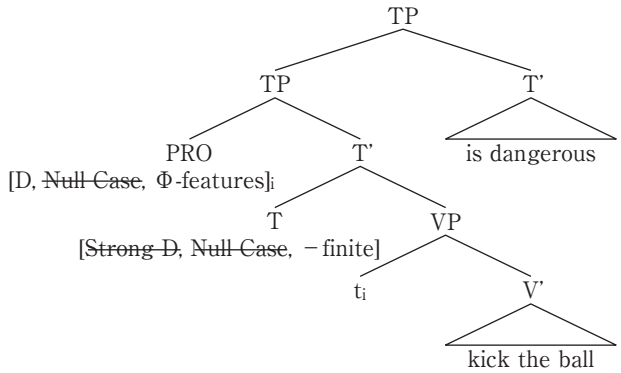
A clause without an overt subject can also be found in English. It is a non-finite clause with a null subject, PRO :

（3）a. [$_{IP}$ I kick the ball].

b. [$_{IP}$ PRO To kick the ball] is dangerous.

We assume, following Chomsky & Lasnik（1995），that PRO is D, and carries Null case and a set of Φ-features. Just like its overt counterpart, PRO is raised from [Spec, VP] to [Spec, TP] in order to check off the strong D feature of *to*-infinitive. The null case of PRO and that of the non-finite T are also checked off at this point.

（4）Operations in Overt Syntax



Thus, the syntactic differences between overt and null subjects in English are the type of structural case and the content of Φ-features. Following Chomsky（2000），we regard structural case as a single unidentifiable feature, treating Nominative and Null cases as variants of the same entity. We also understand that Φ-features are undifferentiated with respect to the value of the individual features of the Φ-set（e.g. [+/ −plural]），and can only be deleted as a unit. Manifestation of structural case is determined by the type of T, either finite or non-finite[3)] ; whilst manifestation of Φ-features on Verb depends on those of the subject.

In discussing the syntax of subjects in Japanese, we need to take a closer look at the phrases occurring at the left periphery of a sentence. It is well-known that in Japanese, more than one noun phrase can be base-generated before a predicate（Hoji 1985; Saito 1985; Tateishi 1991/1994），either being marked with the Nominative marker -*ga* or the topic marker -*wa*. Tateishi（1994）shows that strictly speaking, there are maximally two noun phrases that can be marked with -*ga*, the two closer to the predicate. They, however, differ in that only the one closest to the predicate is θ-marked; the other is non-θ-marked. Tateishi respectively calls them θ-marked subject and Major Subject. According to him, a sentence can have another non-θ-marked noun phrase, preceding Major Subject. It is called Pure Topic. Amongst other syntactic properties, a characteristic of Pure Topic is that it can only be marked with -*wa*,

which contrasts with the other two noun phrases, θ-marked subject and Major Subject, in that they can be marked either -*ga* or -*wa*.

（5）a. θ-marked subject

Taroo-**ga**/**-wa** hon-o　yomu.

Taro-nom/top book-acc read-pres

'Taro reads a book.'

b. Major Subject — θ-marked subject

Niigata-**ga**/**-wa** sake-**ga**　umai.

Nigata-nom/top sake-nom good

'It is Nigata where sake is good.'

c. Pure Topic — Major Subject — θ-marked subject

keizai-nyuusu-**wa**/***-ga**　Nikkei-**ga**　Yukijirushi-mondai-**ga**　daiichimen-ni　not-teiru.

Economy-news-top/*nom　Nikkei-nom Yukijirushi-problem-nom front page-dat　appear-prog

'As to business news, it is Nikkei where the problem involving Yukijirushi appears on the front page.'

Other phrases, apart from noun phrase, can be marked with -*wa*. When -*wa* is attached to a phrase other than noun phrase, it always requires the sentence to have a 'contrastive' reading. This type of sentence always involves movement（Hoji 1985; Ishii 1991; Saito 1985）.

（6）PP topic with a contrastive reading

London-**<u>ni</u>-wa**$_i$ Taroo-**ga** t_i it-ta.

London-to-top Taro-nom go-past

'To London, Taro went.（but to other place somebody else went）.'

To complicate matters, not all subjects or topics need to appear in a Japanese sentence.

（7）a. An example where only a Pure Topic appears

kore-**wa** bunryoo-wo machigae-ta-kana.

This-top quantity-acc mistake-past-seem

'Based on this, it seems that（we/I）put a wrong quantity.'

b. An example where only a PP topic appears

London-**de-wa** gogo-no koocha-o tanoshimi-mashi-ta.

London-in-top afternoon-gen tea-acc enjoy-polite-past

In London,（we/I）enjoyed afternoon tea.'

Unlike Japanese, English does not grammatically distinguish topic from subject, but possesses similar surface structures; a phrase in the subject position is normally the topic of a sentence（Shibatani 1991）. However, when another phrase becomes the topic, it is moved and placed at the sentence-initial position.

（8） a. Subject as a topic

We baked cake last night. **It** tasted better than our Mom's.

b. Other phrase as a topic

In London$_i$, we enjoyed afternoon tea **t**$_i$.

Some surface resemblances are observed between English and Japanese. The surface structures of（8a）and（8b）are similar to those of（5a）and（6）respectively. In（8a）and（5a），there is one subject which is θ-marked; In（8b）and（6），the sentence starts with a topicalised PP, which is followed by a θ-marked subject. However, there are some differences, too. A finite English sentence must have a（n overt）subject DP. In contrast, a Japanese sentence does not need to have a（n overt）subject; it may only have a Pure Topic or a topicalised phrase before a predicate, as we saw in（7）.

3.2. Research Issues

The aim of this research is to find out whether adult L2 learners process a structure of a target language as a result of learning relevant features, focusing on the acquisition of subjects by Japanese learners of English. We have identified that differences between English and Japanese subjects reside in the presence or absence of strong D feature and Nominative case in T, and Φ- features in V. Then we have reviewed two acquisition models. According to Wakabayashi, null subjects in interlanguage occur during the period where L2 learners have not yet learnt appropriate features or taken them into Numeration, and SLA starts with transferring and learning features that require the relevant lexical item to merge in overt syntax. He claims that in the case of Japanese speakers learning non-null subjects in English, transfer is not involved. According to Hoekstra et al., the phenomena of null subjects and root infinitives are due to the problem with grammatical encoding of 'specificity' caused by the underspecification of Number. The reason behind this is that there is a strong evidence that children have

the knowledge of Spec-head agreement. This is also reported in the survey on root infinitives by Prévost & White（2000）. Children use root infinitives instead of incorrect inflectional forms, until they identify correct forms. This speculation is based on the fact that children use correct agreement morphology if they produce them at all. Taking these into consideration, we have prepared the following constructions:

（9）a. ***Null Expletives**（*Null Exp）

In the Rocky Mountains ∅ is snowing at the moment.

b. ***DP Infinitive**（*DP Inf）

John to study law at Oxford University pleased his mother.

c. ***Agreement Errors**（*Agr Error）

In spite of much effort, **they** still **has**n't finished their work.

The constructions in (9) are ungrammatical either because a feature is lacking or because types of a feature do not match. In (9a), the finite Infl has Nominative case and the strong D feature, which are to be checked and erased in overt syntax against the features of the subject. However, the subject is either null or absent. In the former case, Nominative case cannot be checked off. In the latter case, neither Nominative case nor the strong D feature can be checked off. Hence the structure results in being ungrammatical in both cases. In (9b), Null case and the strong D feature in *to*-infinitive need to be checked and erased in overt syntax[4]. Whilst the strong D feature can be checked off against that of the overt subject, Null case cannot be. This makes the construction ungrammatical. In (9c), the specification of Number associated with V does not match with that of the subject DP. The Φ-feature cannot be checked and erased in covert syntax; hence the ungrammaticality of the construction. In short, the detection of ungrammaticality in both (9a) and (9b) requires the acquisition of the same feature(s), i.e. structural case (as well as the strong D feature); whereas, the recognition of ungrammaticality in (9c) involves the acquisition of the Number feature.

Recall that Wakabayashi claims that the features which merge in overt syntax would be acquired earlier than those which merge in covert syntax. We could then expect that learners would notice the ungrammaticality of *Null Exp and *DP Inf around the same time, and that the ungrammaticality of *Null Exp and *DP Inf would be noticed earlier than that of *Agr Error. This is because the same features which need to be checked in overt syntax are responsible for *Null Exp and *DP Inf [5], and because the Number feature, which merges in covert syntax, is liable for *Agr Error.

If, on the other hand, SLA is carried out in the same way as L1 acquisition, we would expect that learners notice the mismatch in the type of structural case in *Null Exp and *DP Inf around the same time as or soon after they notice the agreement mismatch in *Agr Error. This is based on what Hoekstra

et al. argue. In English, specification of Number is responsible for the visibility of subject DPs. In other words, we would be able to see a correlation between correct use of verbal inflections and that of subject DPs. Thus learners' performance is expected to show a particular pattern of a '*clustering effect*'[6].

3.3. Data Collection

As part of a larger study, a grammaticality judgement test was administered to 100 native speakers of English and 100 Japanese learners of English. They were asked to respond to 100 sentences by circling *OK, Not OK* or *?*. Those sentences included the three ungrammatical English constructions mentioned in the previous section, and each construction consisted of five sentences.（see Appendix A）.

3.4. Method of Analysis

Clustering is a fundamental concept in the UG parameter theory, which is understood as a phenomenon where underlyingly related grammatical properties emerge together in a language（Meisel 1995）. Within the MP framework, parametric difference is understood as the presence or absence of a particular feature, or the difference in its binary specification. We therefore assume that if a particular feature becomes available for adult learners, a clustering effect would be present, being manifested in our data as the following pattern: at first, learners' success rates stay at a low level or increase moderately with proficiency until a threshold level. At this point, success rates increase much more rapidly（a discontinuity effect）[7] and ultimately approach those of native-equivalent levels（an ultimate success effect）.[8] This will happen for all construction types associated with the feature around the same proficiency level（a clustering effect）. I illustrate this behaviour in Figure 2, renaming it as a *feature-acquisition effect*.

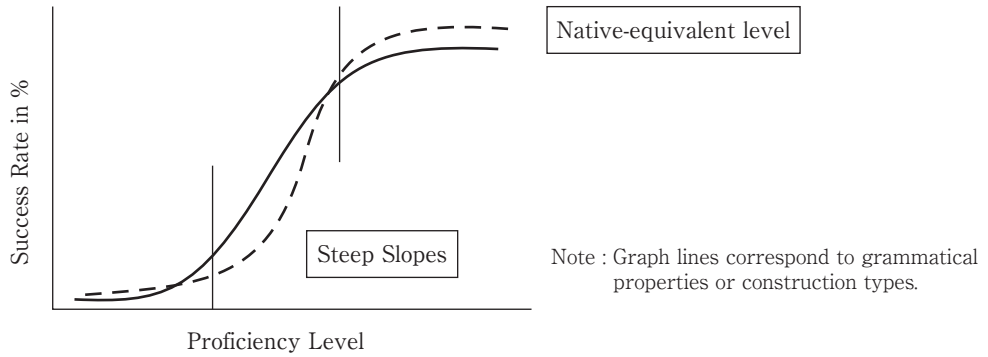


Figure 2. Feature-acquisition effect in the relationship between success rate and proficiency level

In order to examine whether the data exhibit such a pattern, we first divided the Japanese subjects into 10 proficiency groups with a 30-point interval :

Score	360-	390-	420-	450-	480-	510-	540-	570-	600-	630-
Number	9	16	10	7	6	10	13	9	8	12

Table 1. Proficiency bands based on the TOEFL test scores and the number of Japanese subjects in each band

For each proficiency group of the Japanese subjects and for the native speaker group, the number of responses classified into *correct, incorrect* and *undecided* were then totalled and calculated as percentages with respect to each sentence and construction type.

The presence of a feature-acquisition effect was also investigated using statistical procedures. The existence of a discontinuity effect in the data was tested by applying logistic regression analysis. In this analysis, the frequency data were first transformed into logistic values called *logits*,[9] and then two types of linear regression models, a simple regression model and a "broken-stick" regression model were fitted to the logit data for individual test constructions. Finally, an F-test was carried out for each construction to see whether the data fit a "broken-stick" regression model significantly better than a simple regression model. Subsequent to this, the presence of an ultimate success effect was investigated by examining whether the native speakers' success rates fell into the confidence intervals of the estimated models for the three constructions.

3.5. Results

Figure 3 and Table 2 offer the percentage correct scores on the three test constructions of the Japanese leaner groups and the native English group. First, let us look at how well learners performed on each construction type. The highest scores on the three test constructions have been achieved by the same proficiency band, 600-629. The score for *Null Exp is 88%, which is very close to the native speakers' rate, 91%. A native-like performance is also observed in another test construction, *DP *to*-Inf. The band's score is 96%, which is actually higher than the native speakers' score, 89%. The rate on *Agr Error is considerably lower than that of the native group.

A sharp rise in success rate seems to be present in all the constructions around the same proficiency bands: between 480-509 and 510-539 for *Null Exp, and between 450-479 and 480-509 for *DP *to*-Inf and *Agr Error. The differences in the success rates between those bands are 45% for *Null Exp, 33% for *DP *to*-Inf and 39% for *Agr Error respectively.

It appears as if the conditions required by the feature-acquisition are, not perfectly, but almost met. However, if we take both ultimate success effects and discontinuity effects together into consideration, we notice that the discontinuity effects observed in the three constructions have different characteristics. The sharp rise of the graph line of *DP *to*-Inf immediately leads to the native-equivalent rate, and this rate is maintained throughout the higher proficiency levels. On the other hand, the sharp increase in the

success rates of *Null Exp and *Agr Error does not lead to better than chance-level performance. The success rates on those two constructions continue to rise in a rather gradual manner, and eventually only one of them, i.e. *Null Exp, reaches a level comparable with native speakers.

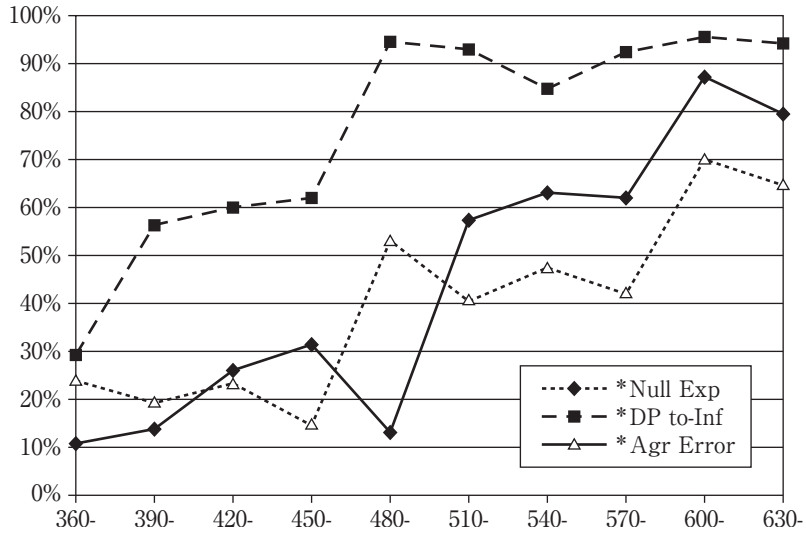


Figure 3. Japanese proficiency groups' percentage correct scores on each test construction

*Null Expletive	*DP *to*-Infinitive[10]	*Agreement Error
90.98%	89.33%	86.60%

Table 2. Native speakers' percentage correct scores on each test construction

In order to identify a possible discontinuity effect in the data, we have carried out a generalised regression analysis. The results are summarised in Table 3:

Construction	*Null Expletive	*DP *to*-Infinitive	*Agreement Error
Break Point	600-629	480-509	390-419
F-value	0.2367	1.90	0.6627

The 5% significance level for $F_{2,6} \geqq 5.14$
The 1% significance level for $F_{2,6} \geqq 10.98$

Table 3. F-values obtained from significance tests of a "broken-stick" regression model against a simple regression model for the three test constructions, and the positions of break points

The results show that none of the graph lines fits a "broken-stick" model significantly better than a simple regression model. The 5% significance level for $F_{2,6}$ is achieved by any value which is greater than or equal to 5.14. None of the F-values of the three test constructions meet this condition（For *Null Exp, $F_{2,6} = 0.2367$ at break point 600-629; For *DP *to*-Inf, $F_{2,6} = 1.90$ at break point 480-509; For *Agr

Error, $F_{2,6} = 0.6627$ at break point 390-419）.

Figure 4 shows the estimated success rates of the three constructions, which have been transformed back to the percentage measurement scale based on the results of the logistic regression analysis [11] :

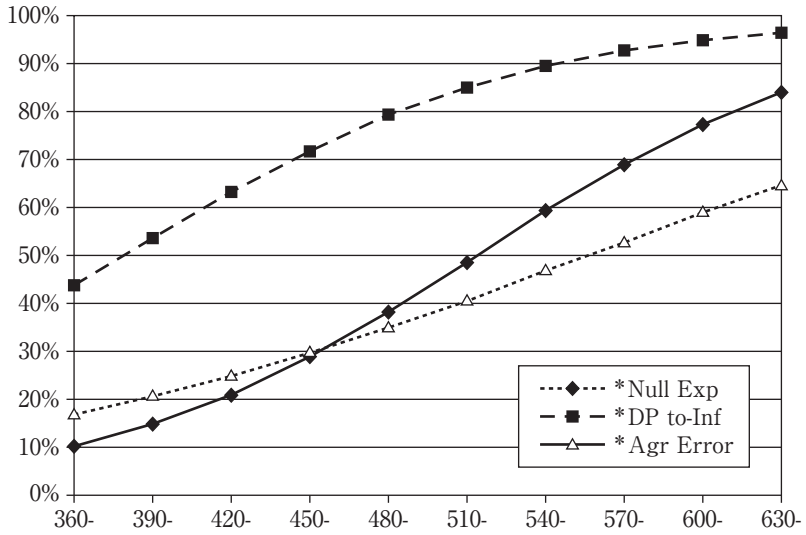


Figure 4. Predicted percentage correct scores on the three test constructions after regression modelling

It is apparent from the slopes of these graph lines that the learners have noticed the ungrammaticality of *DP *to*-Inf much earlier than that of the other constructions.

Using the estimated models, the learners' ultimate achievement is examined. The results are summarised in Table 4 :

Construction	Native Rates	Lower 95%μ	Upper 95%μ
*Null Expletive	2.31	(0.84	2.47)
*DP *to*-Infinitive	2.12	(2.47	4.41)
*Agreement Error	1.87	(－0.06	1.32)

Table 4. Native speakers' correct response rates and the 95% confidence intervals of the correct response rates of the most proficient Japanese group based on the estimated models for the three test constructions (logit)

It indicates that the native speakers' scores fall into the confidence intervals of the estimated success rates of the most proficient learners only in *Null Exp, but neither in *DP *to*-Inf, nor in *Agr Error. The learners' estimated score on *DP *to*-Inf is actually higher than that of the native speakers, whereas the learners' estimated score on *Agr Error is lower than that of the native speakers. These results can be interpreted as meaning that learners have reached the level of native speakers in two out of the three test

constructions.

To summarise the results with respect to a feature-learning effect, there is no discontinuity effect observed in the data of the three constructions, whilst the ultimate success effect is satisfied for two of the three.

4. Discussion

The patterns revealed by the graph lines of the three constructions are not consistent with the pattern expected from either of the feature-acquisition models described in previous sections（see 2.2. and 2.3.）. If SLA was carried out in the same way as L1 acquisition, the success rates of all three constructions would increase at more or less the same time, and reach the level of native speakers. If, on the other hand, SLA was carried out as Wakabayashi claims, the success rates of *Null Exp and *DP *to*-Inf would increase around the same time and earlier than the rate of *Agr Error. It would be certainly expected by neither of the models that only the success rate of *DP *to*-Inf would begin to rise sharply much earlier than the rates of the other constructions. Thus it is not likely that the learners have acquired their linguistic knowledge of their target language through learning new features, at least in such fashions as those models claim.

Assuming that no new features are available to adult L2 learners, let us now consider the questions of what mechanism is involved in SLA and how it can account for the patterns the Japanese learners have exhibited in responding to the respective test constructions. We argue that "L1 transfer" can offer an answer to these questions. We understand "L1 transfer" as the phenomenon where L2 learners associate lexical items or morphophonological materials of their target language with the features of their native language, as Tsimpli and colleagues argue. Further we claim that the association or mapping process is based on similarity in meaning and/or function between the lexical items of two languages（Kuribara 2000; cf. Keller-Cohen 1979; Kellerman 1977; Jordens & Kellerman 1978; Selinker 1996; Wode 1976, 1978, 1980）. We also claim that the process is automatic（Selinker 1996）, reflecting a property of modularity. In other words, learners produce and decode a second language, implementing the already existing properties in their linguistic module. Let us see how this theory accounts for our research data, focusing on the performance by low proficiency learners.

With respect to *Null Exp, all the test sentences require expletive *it* as subject in order to be grammatically correct. Our data show that the learners overwhelmingly accept *Null Exp. We suspect that this is due to the fact that subjects need not be projected in overt syntax in Japanese, due to lack of the strong D feature and Nominative case feature in T. Therefore, Japanese does not possess such an element as an expletive *it* or a functionally similar lexical item, hence also lacks a structure involving the

element. In addition, all the arguments or θ-marked phrases necessary for processes in L1 syntax are present in the test sentences. This has led the low proficiency learners to the acceptance of the ungrammatical construction, *Null Exp.

We suspect that the low proficiency learners' unsuccessful performance on *Null Exp is partly attributable to the existence of a topic phrase in front of a verb. This might have disguised the apparent lack of subject in the construction, which is too salient not to notice. We claim that the learners have misanalysed the [subject [predicate …]] structure of English as the [topic [predicate …] structure of Japanese. This is caused by the similarity between those two structures, described in section 3.1. The test sentences of *Null Exp contain the [topic [predicate …]] structure. Using the wrong analysis, the lower proficiency learners end up accepting the ungrammatical construction（cf. Sasaki 1990, Sawasaki 1996）.

A close look at the data supports this analysis, and reveals an interesting fact. Three out of the five test sentences contain a topicalised PP. There are 262 incorrect responses as a whole. Out of this, 58 responses have been categorised as incorrect although the sentences have been correctly rejected. This is because only the prepositions in the PP topic phrases are underlined and because this does not conform to the criteria set for the correct responses for *Null Exp（see Appendix B）. This implies that the learners even at the low proficiency level are aware that in English a clause normally has a phrase before a verb and that this phrase has to be a noun phrase. What they do not know, however, is that the noun phrase has to be an argument, if not an expletive, in English. This confirms our claim that the learners have not acquired a new feature such as the [strong D], which triggers the movement of a DP from [Spec, VP] to [Spec, TP].

The results on *Agr Error can also be accounted for straightforwardly by our theory. The low success rates produced by the low proficiency learners are explained again by the use of their L1 knowledge, which lacks morpheme encoding Φ-features such as Number. This implies that the learners cannot associate the verb in *Agr Error with the feature, but simply map the categorical feature V and the tense feature [+/− past] onto it.

The L1 transfer theory basically claims that if the learners' L1 possesses the same syntactic properties as their L2, the learners would exhibit high success rates, correctly judging the grammaticality of a particular structure. But high success rates are expected by the theory also in the condition where L1 syntactic knowledge coincidentally makes the same judgement as L2 syntactic knowledge does, even if the relevant syntactic properties of L1 are different from those of L2. This is what we observe from the results of *DP *to*-Inf:

（10）a. *To*-infinitive as a clausal subject

*John [to kill Mary] is unthinkable.

b. Mearii-o korosu-koto

Mary-acc kill-nomimaliser

（11）a. *To*-infinitive as a purpose clause

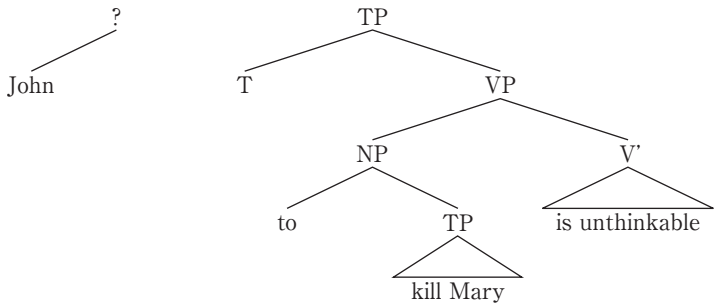
*Mary [to concentrate on her work], John kept quiet.

b. shuuchuushite shigoto-o suru -tame

concentrate work-acc do -nominaliser

(10a) and (11a) are ungrammatical sentences, having an overt DP in front of a non-finite clause. (10b) and (11b) are possible Japanese translations of the underlined parts of (10a) and (11a) respectively, where the infinitive *to* is understood as a nominaliser. It is unclear, even from L1 syntactic point of view, how those two nominals, *John and Mary,* can form a syntactic object with the rest of the clause.

（12）Interlanguage Analysis of ‘John to kill Mary is impossible.’



This is reflected in the Japanese learners’ successful performance even from the early period of the L2 acquisition process.

Nonetheless, it may still be argued why the success rate of the low proficiency learners on this construction is not as high as that of the native speakers if the learners’ native syntax regards the structure illicit. This can be explained if we assume, following the ‘Lexical Transfer’ part of Wakabayashi’s model, that there is a pre-functional stage during which learners are still looking for suitable matches between L2 lexical forms and L1 features（cf. Selinker 1996）.

5. Conclusion

Examining Japanese speakers' acquisition patterns of constructions involving subjects and verbal inflections in English, we have shown that low proficiency learners' data can be plausibly accounted for by a Full Transfer model rather than a Feature-Learning account. It has been found that the learners' success rates on the constructions do not cluster or reveal the patterns in the ways expected by feature-learning models, the model generally assumed by L1 acquisition and the model suggested by Wakabayashi（2002a）. In contrast, an automatic L1 feature-mapping theory has been able to offer an explanation for the fact that the learners notice the ungrammaticality of *DP *to*-Inf much earlier than that of *Null Exp and *Agr Error: the former structure tends to be rejected because it is also ungrammatical in L1, whilst the latter structures tend to be accepted because L1 does not possess features and lexical forms equivalent to an expletive or agreement morphology, and hence the learners do not notice the mismatch in feature specifications between subjects and verbs.

6. Implications for a Theory of Transfer: Selinker （1992, 1996）

Selinker（1992）, referring to Weinreich（1953）, suggests what he believes is a basic SLA learning strategy, which seems to serve as an underlying mechanism for the 'similarity' account suggested by Kellerman（1977）among others. This is called *interlingual identification.* The following passage explains *transfer* using the concept.

> *What language transfer is about is that learners take what they know from their NL [native language] and look, in the TL [target language] input, for categories that match. … These cognitive mechanisms which provide a means to identify which features of the TL input 'resembles' features of NL, appear to function automatically* （*Selinker 1996, p.102*）

This statement can only be understood in more concrete terms, if we take an approach of the Minimalist Program and the Modular Theory of the mind as we have suggested in this present study. This way of understanding *transfer* will provide us with answers to a series of questions raised by Selinker. Features are the unit of language that interlingual identification is concerned with. The property generic to the modular structure of the mind forces the identification process. Transferability is determined by the similarity of lexical items of two languages in terms of their meanings and functions that can be captured from the input. Thus, the structures that happened to be ungrammatical as a result of L1 mapping are to be correctly rejected or not to be produced. It also seems to be true that transferability is also influenced by cognitively salient aspects of structure, such as the existence of an overt noun

phrase before a predicate.

End Notes

1）The earlier version of this paper was presented at Second Language Research Forum 2002, organised by OISE, the University of Toronto. I would like to thank my audience, especially Tania Ionin, Miki Shibata, Shigenori Wakabayashi and Lydia White for their valuable comments. I am also grateful to Yoichi Miyamoto and Shigenori Wakabayashi for their insightful comments on the first draft of this paper. Last but not least, I would like to acknowledge gratefully that this research was financially supported by the Kansai University Grant-in-aid for the Faculty Joint Research programme 2002.

2）The term *lexical item* here means a bundle of features which only encode minimum information necessary for the computational system to yield the LF representation and for the phonological component to construct the PF representation. Thus, the information may be a phonological matrix, semantic properties, categorical feature and other idiosyncratic properties that are unpredictable from UG or other properties of the lexical entry.

3）Finite T possesses Nominative case; non-finite T possesses Null case. It should also be noted that within the VP-shell analysis where VPs have a complex structure consisting of an inner VP core and an outer vp shell, v, the head of vp, is a functional category and possesses Accusative case. All the three Cases are regarded as variants of a single feature in Chomsky（2000）.

4）Wakabayashi （personal communication） points out that PRO, without phonological features, may not be raised from [Spec, VP] to [Spec, IP] in overt syntax, and that the features such as null case may be checked and erased in covert syntax. We think, however, that if a structure is formed in a bottom-up fashion as Chomsky（1995）claims, PRO, or more precisely, the categorical feature of PRO needs to be raised to [Spec, IP] in order for the upper part of the syntactic object to be built. It is possible, though, for a feature like null case to be checked covertly, respecting the Principle of Procrastinate.

5）Wakabayashi (personal communication) argues that it is not plausible to predict that the two test constructions, *Null Exp and *DP Inf, would show a similar acquisition pattern, because of a difference in input relevant to those constructions. He says that in order to detect the ungrammaticality of *Null Exp, learners need to know that a null subject is not allowed in front of a finite verb; whereas in order to notice the ungrammaticality of *DP Inf, learners need to know that a proper noun requires a complementizer such as for which serves as a case checker. We would argue, however, that correctly rejecting *Null Exp requires learners to realise that not null but only overt subjects are allowed, and that in an exactly parallel fashion, correctly rejecting *DP Inf requires learners to realise that not overt but only null subjects are allowed. Therefore, we believe that there are logical grounds to expect that the two test constructions would show a similar acquisition pattern.

6）Wakabayashi (personal communication) argues based on his recent study (Wakabayashi 2002b) that the error rates on (9c) would be lower if there was no intervening element, such as *still*, between the subject and the verb, suggesting that lower success rates on (9c) in comparison with those in other constructions are attributable to a performance factor rather than the learners' knowledge. This is possible; however, it is unlikely that the learners' apparent low success rate on (9c) is a result of a significant amount of influence from

a performance factor. This is because the native speakers are also prone to a performance factor and actually known to make agreement errors in such a condition, but because even under this condition their success rates on the three constructions in (9) cluster at around the level of 90% (see Table 2).

7）Wakabayashi (2002a; personal communication) states that his SLA model predicts a gradual rather than sudden development because SLA involves learning individual lexical items. Nonetheless, it can be argued that once a relevant feature is acquired, the learning process would be accelerated

8）Schwartz & Sprouse（1994）claim that unlike the case of child L1 acquisition, adult L2 acquisition has the *determinacy problem* where the acquisition process is not deterministically driven. S&S speculate that the problem is caused by the fact that L2 learners start with L1 parameter values and that there may not be input which can force retraction from the pre-fixed parameter values or the parameter values which are set during the acquisition process. Once a parametric property is acquired, i.e. a parameter is set from [−] to [+], it is difficult to 'delearn' it, unless there is positive input which informs the learners that the setting is incorrect for the target language. According to S&S, this is the reason why L2 learners' success is usually incomplete or does not reach native speakers' level despite that L2 acquisition is guided by UG and learnability considerations in the same way as L1 acquisition. The logic seems to imply that it would be more difficult for the native speakers of an L1 which has many parameters set into the [+] values to learn an L2 which has few parameters set into the [+] values. This is because the learners would have to 'delearn' many parametric properties. In contrast, it would be easier for the native speakers of an L1 which has few parameters set into the [+] values to learn an L2 which has many parameters set into the [+] values, because the process of 'delearning' would not be involved. This may suggest that in the latter case, L2 acquisition will proceed just like L1 acquisition. The latter would be what is expected in their Turkish subject's acquisition of German. However, his acquisition process did not follow the route of native German acquisition. This has been shown by S&S's analysis of the data indicating that he seemed to have acquired（at least at one point of the developmental process）some parametric properties which do not exist in the target grammar, such as left-adjunction to CP and nominative case checked under incorporation. S&S（1994, p.350）attempt to explain the cause of this divergence from the native route in the following way:

> *[F]rom a computational perspective, the number of possibilities that would need to be computed in order to move straight from the L1 grammar to 'the' German grammar would seem to be enormous; in this sense, smaller adaptations made to the existing system can be seen as more highly valued, for the precise effects of small and/or localized, incremental changes can be more easily computed with respect to the incoming PLD [primary linguistic data].*

If this is the case, then the cause of the determinacy problem, i.e. the problem for L2 acquisition, ultimately lies in the computational burden which requires localised operations for the accommodation of the internal syntactic representation to the target input. With the assumption that L2 acquisition is led by the same mechanism as L1 acquisition, there is no necessary reason that L2 learners have to start off with transferring their L1 parametric options in the first place. It is unclear why only L2 learners would have to experience computational restriction and go through a series of unnecessarily complicated adjustments of L1 representation, if they were guided by the same mechanism as native acquirers. This casts doubt on S&S's model itself and their claim that adult L2 learners' achieving native speakers' level is not a necessary condition for parameter-setting.

9）The logistic transformation was carried out as part of a procedure for logistic regression analysis, using the statistical package, SAS. The formula for the transformation inputted in a SAS program is: Log（p/（1－p））where p= proportion.

10）It should be noted that two sentences out of the five *DP Inf construction contained gerundival clauses. About 30% of the time, they were often accepted by the native speaker group, and the overall success rate on the construction was 76.2%. We therefore decided to re-calculate the results of the construction for both subject groups by including only *to*-infinitives. We then re-labelled the construction as *DP *to*-Inf.

11）Logistic values obtained from the logistic regression were transformed to percentages. The formula which changes logits to percentages is $p=1/(1+e^{-z})$, where p = proportion, and z = logit. The calculation was done using Excel.

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Appendices

Appendix A: Test Sentences

Note: The number appearing next to the sentences corresponds to the sentence number in the test.

***Null Expletive:**

50. *In the Rocky Mountains ∅ is snowing at the moment.

7. *This time ∅ seems that he followed my advice.

77. *In the meeting ∅ was suggested that students should water the plants in turn.

91. *Last night ∅ annoyed me that the person next door was listening to loud music.

85. *At Christmas ∅ is extremely hot in Australia.

***DP Infinitive:**

64. *John to study law at Oxford university pleased his mother very much.

45. *Doctors to be able to earn a lot of money encourages many students to choose this career.

33. *Susan to arrive at the airport on time, her brother took her in his car.

3. *My friend having a bad cold, I brought her medicine and food.

22. *John liking music, I gave him 3 CDs on his birthday.

***Agr Error:**

21. *I must see a dentist soon because some teeth at the back is getting very painful.

69. *In spite of much effort, they still hasn't finished the work.

31. *Mathematics, I'm afraid, are really hated by the students in my class.

93. *When teachers asked for volunteers, every student in the class were willing to take part in the activity.

5. *Your trousers hung over the chair needs to be repaired.

Appendix B: Scoring criteria for responses to test sentences

A response was scored as 'correct' if a subject

***Null Expletive**

- indicated missing 'it' by using the carat mark ∧.
- underlined the finite verb and/or the space for 'it'.

***DP Infinitive**

- indicated a missing complementizer by using the carat mark ∧.
- underlined the non-finite verb and/or the subject noun phrase.

***Agr Error**

- underlined the (finite) verb and/or (the head of) the subject noun phrase.