
日本人英語学習者の関係代名詞節構文・疑問構文の
処理過程の解明に関する研究

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はしがき

本報告書は、平成17年度から平成19年度に科学研究費補助金（基盤研究（C））の助成を受けて行った研究の成果を報告するものである。研究課題は「日本人英語学習者の関係代名詞節構文・疑問構文の処理過程の解明に関する研究」であり、第二言語としての英語の習得過程において、成人日本人学習者はどのような処理（解析）方略を用いて文の理解を行っているのかを解明することである。特に、本研究では、日本語とは生成過程が大きく異なり、そのために学習が比較的困難であると言われている「関係代名詞節構文」と「wh 疑問構文」に焦点をあて、それらの構文を理解する反応時間を測定するオンライン（on-line）実験を用い、英語母語話者との比較を通して第二言語学習者の文処理（解析）過程を明らかにしようとしたものである。

報告者は、これまで成人日本人英語学習者の文法能力の発達過程を、関係代名詞構文と wh 疑問構文に焦点をあて、オフライン（off-line）タスクとして文法性判断テストを用いて調査・研究を行ってきた。結果として、日本人英語学習者は英語熟達度が high-intermediate レベルに達すると、関係代名詞節構文と wh 疑問構文を正しく理解し、英語母語話者と同じようなパフォーマンスを示すことが明らかになった。更に、その理解の過程において普遍文法（Universal Grammar: UG）の原理が働いていることが明らかになった。しかしながら、疑問点として、日本人英語学習者は英語母語話者と同じ言語処理方略を用いて、関係代名詞構文と wh 疑問構文を理解しているかが残された。また、Marinis (2003)は、文法的な困難さと処理的な困難さのどちらが、第二言語学習者が wh 移動を含む文の文法性を正しく判断することを困難にするかという課題に対して、オンライン実験による調査がその決定的な証拠を示すと述べている。

上記の疑問点を解決するために本研究を計画したが、実験において、オンラインタスクの設定や実験参加者の確保に関する問題が（次々と）生じ、当初期待した結果を得ることは出来なかった。特に、報告者がオンラインタスクの設定に必要以上に手間取り、うまく設定ができなかった。また、英語熟達度の上位者と非日本語母語話者の実験協力者を確保することにも困難が生じた。このように、予備実験の設定段階において多くの困難を抱えてしまい、研究期間内に第二言語習得研究や外国語教育研究（特に、日本人のための英語教育研究）に十分に貢献できるような成果を出すことは出来なかった。

従って、本報告書では、第1部において本研究のために新たにまとめたオフライン実験による成人日本人英語学習者の関係代名詞構文と wh 疑問構文の習得に関する成果を報告する。なぜなら、Marinis (2003)も述べているように、第二言語習得研究においてオンラインを用いた実験の必要性を正当化するためには、まず、オフラインによる実験に基づい

て、第二言語習得において（本研究が理論的枠組みとして用いる）UG が有効性であるか否かを調査した研究を正しく理解することが必要だからである。続いて、第2部では、第1部の実験結果が文処理におけるオンライン法を用いてどのように説明できるかを試みた実験を紹介する（実際には、先に述べたような不備のため、先行研究の概観と実験方法に留める）。

最後に、本研究では所期の目標を達成することが出来ず、またそこへたどり着くまでの実験も思ったように出来なかった。従って残された課題も多く、更に継続して実験参加者の確保と実験方法の精選をはかり、第二言語習得のメカニズムの解明を目指して確実な調査を続けていくことが必要であり、そのための研究計画を現在立て直しているところである。このような研究の成果は、必ずや日本の英語教育の発展に寄与すると思われる。更に精進していきたい。

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研究発表

（1）学術誌掲載論文

Ohba, H. (2007). The Acquisition of the Surface Morphological Properties of Relative Clauses and *Wh*-questions in English by Adult Japanese Speakers. *Proceedings of the 11th Pan-Pacific Association of Applied Linguistics*, 191-201.

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Ohba, H. (2006). The Acquisition of the surface morphological properties of relative clauses and *wh*-questions in English by adult Japanese speakers. The 11th International Conference of Pan-Pacific Association of Applied Linguistics, Kangwon University, Korea, 27th-29th July 2006.

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第 1 部

**The Acquisition of *Wh*-Movement in English information
Questions and Relative Clauses by Native Speakers of Japanese**

1 Introduction

1.1 Goals of Second Language Acquisition Research

Over the last two decades a considerable amount of research has been carried out to investigate whether or not Universal Grammar (UG) is still available to second language (L2) speakers. Current approaches to the study of L2 acquisition within a UG perspective need to explain the following two topics (Hawkins, 2001a:1):

- (1) How knowledge of syntax develops over time: why are some aspects acquired earlier than others, and why do some remain difficult even for advanced L2 learners?
- (2) What makes it possible for L2 learners to build mental grammars in the first place: what mechanisms or devices does the human brain make available for such task?

The former is referred to as the developmental problem, and the latter the logical problem (i.e., The Poverty-of-Stimulus) of L2 acquisition. Hawkins (2001b) further claims that in addition to the logical problem of L2 acquisition, we should shed as much light as possible on L2-L1 differences in order to form theories of L2 acquisition.

1.2 UG in L2 Acquisition

One of the important distinctions that has guided work on L2 acquisition from the perspective of generative grammar is that between 'universal' aspects of linguistic knowledge which derive from human genetic endowment, and 'language particular' aspects which have to be acquired on the basis of experience. In classical generative linguistics (Chomsky 1981, 1982, 1986, 1995), this distinction is captured through the notion of 'principles' (the part determined by genetic endowment) and 'parameters' (a set of limited options for variation between languages whose values are fixed by experience).

Consider an example to illustrate this contrast, and one that will form the focus of investigation: the representation of information questions and relative clauses in

Japanese and English. In focus-neutral Japanese information questions, a *wh*-phrase typically remains in the position in which it receives its theta role (in situ), while in English a *wh*-phrase must move to the front of the interrogative clause (movement to the specifier of the interrogative complementiser phrase):

- (3) a *Anata-wa* *nani-o* *tabete imasu ka?*
 You-Top what-Acc eating are Q
 b What are you eating?

In relative clauses in Japanese, a clause is simply predicated of a potential target of relativisation (i.e. a noun) without an overt relative complementiser, and typically without a gap in the clause corresponding to the relativised noun. In English, relative clauses have a relative complementiser, and there is an obligatory gap in the clause corresponding to the relativised noun:

- (4) a *anata-ga* *ka-tta* *hon*
 you-NOM bought-PAST book
 b a/the book which you bought

It appears that there is no difference in the way that information questions and relative clauses are interpreted in Japanese and English. This would follow if it is assumed that operations of semantic interpretation are universally invariant: every language has the same range of linguistically interpretable options. Japanese and English differ, however, in how the operations interpreting information questions and relative clause modification are realised in externalisable form as syntactic expressions. In English a constituent must move to the left periphery of a clause. In Japanese no such movement is required. The principles governing semantic interpretation are the same in both languages, but they have chosen different values of a parameter associated with the complementiser category.

In studies of L2 acquisition where a speaker's L1 has a different setting of a parameter from that found in the target L2, the question arises as to how successful L2 speakers are acquiring the different setting. Do they acquire such language-specific properties

uninfluenced by their L1? Does acquisition take place over time; are there stages on the route to acquiring the value of a parameter in the L2? How successful are L2 speakers ultimately in establishing the experience-determined settings of parameters?

Results in previous work have been mixed. Some studies have found that (post-childhood) L2 speakers fail to fully acquire the properties associated with particular parameters whose values differ between the L1 and L2 (Bley-Vroman, Felix and Ioup, 1988; Hawkins and Chan, 1997; Johnson and Newport, 1991; Schachter, 1989, 1990), while others have found that they do (Crawford, 2002; Li, 1998; Martohardjono, 1993; Shimizu, 1994; White and Juffs, 1998). Some studies have claimed that there is L1 influence, while others have claimed that there is not. Some studies have suggested that there are intermediate stages in development towards setting a target language parameter value, while others have claimed that although values are fixed early on, this may not be directly reflected in performance.

The present study will examine the acquisition of *wh*-fronting in English information questions and relative clauses by adult native speakers of Japanese at proficiency levels ranging from elementary to advanced. Of particular interest will be a proposed contrast between the structure of information questions and relative clauses in Japanese. In information questions, English has the features [+*wh*, +*Q*] in C, and they are both strong features which force *wh*-operator movement and subject-auxiliary inversion. A [*wh*] feature in Japanese, on the other hand, is not strong and hence it does not need *wh*-operator movement. However, in many analyses it is assumed that information questions involve operator movement, like English, with the difference that movement occurs at Logical Form (LF) and not in overt syntax (as in English). Takeda (1999) has argued that relative clauses have, however, a different structure. In English a relative complementiser has the feature [+*R*] (for 'relativised') which forces overt operator movement. In Japanese there is no [+*R*] feature and hence no operator movement. Relative clauses in Japanese are predicational constructions where a clause is predicated of a noun. An interesting question is whether this contrast plays any role in the acquisition of information questions and relative clauses in English by Japanese speakers.

2 Research Questions

Based on the results of the previous research and the linguistic background outlined above, the following research questions are addressed in this study:

- (1) Can adult Japanese L2 speakers with different English proficiencies acquire the surface morphological properties of *wh*-questions and relative clauses in English? If so, how does the surface morphological properties of *wh*-questions and relative clauses in English develop across the English proficiency levels, and at which level of English proficiency can adult Japanese L2 speakers overcome the difficulties and show the same understanding as English native speakers?
- (2) Are there any differences in the development of the surface morphological properties between *wh*-questions and relative clauses?
- (3) Can adult Japanese L2 speakers with different English proficiencies acquire feature-driven movement in English in their interlanguage mental grammars (i.e. are they sensitive to Subjacency violations), if they can acquire the surface morphological properties of *wh*-questions and relative clauses in English?
- (4) Is there any difference in sensitivity to Subjacency violations between *wh*-operators and relative operators in different kinds of island constructions?

3 The L2 Study

Prior to the main study, as a pilot, I conducted small-scale research with a small number of participants who were asked to perform grammaticality judgement tasks in order to check the reliability and practicality of the tasks.

3.1 Experimental Design

This study focuses on whether L2 speakers have access to UG in constructing grammars

for the target language. The purpose of the present study is to seek answers to the research questions listed in section 2. In order to answer these questions, I set out to collect empirical evidence that has a bearing on the acquisition of the complementiser system in interrogatives as well as relative clauses by L1 Japanese speakers of L2 English.

This section describes the design of the study. It reports on the participants and their backgrounds, the instrument used in the study, the procedure and the scoring system used for the study.

3.2 Participants

The experiment was undertaken with 287 adult native speakers of Japanese as participants for the study, who lived either in Japan or in the UK at the time of the experiment. 117 of the participants were male and 170 were female. The age that the participants started learning English was above 10, and their age range was from 18 to 47, with an average of 20.72. Their length of stay in English-speaking countries prior to the experiment varied from 0 to several years. All the participants had studied English in Japan for a period of at least 6 years, and were university students, 249 of whom were undergraduate and 38 postgraduate. 17 out of 38 postgraduate students lived in the UK and the rest of the postgraduate and undergraduate students lived in Japan at the time of the experiment. None of them was a linguistics student, although some of them had majored in Teaching English as a Second/Foreign Language (TESL/TEFL). Sixteen native speakers of English (British, American and Canadian), who worked at junior or senior high schools as assistant English teachers in Japan at the time of the study, were randomly selected for the experiment as a control group. Their ages ranged from 20 to 34, with an average of 26.88.

Participants were divided into five proficiency groups (elementary, low-intermediate, intermediate, high-intermediate and advanced) on the basis of performance on an independent measure of proficiency: the Oxford Placement Test (OPT) (Allan, 1992), a standardised proficiency test. Details of the number of participants, the average age, and the scores on the OPT in each group are summarised in Table 1. A one-way ANOVA

(analysis of variance) showed that there was a statistically significant difference among the five proficiency groups of native Japanese speakers ($F_{4, 282} = 1046.123, p < .001$). A *post hoc* comparison test (by Tukey's HSD test) indicated statistically significant differences between all the possible pairs ($p < .001$). This means that there is a completely developmental sequence in terms of the general English proficiency level, as the OPT predicted.

Table 1 Participant details

Group	N	Age	Oxford Placement Test				
			Range	Mean	SD	Min	Max
Elementary	104	19.11	105 - 119	112.72	4.462	105	119
Pre-intermediate	96	19.63	120 - 134	125.82	4.175	120	134
Intermediate	46	21.61	135 - 149	141.91	4.371	135	149
Post-intermediate	33	25.67	150 - 169	158.33	5.010	150	168
Advanced	8	29.50	170 - 200	175.50	4.598	170	184
Native control	16	26.88	-	-	-	-	-

3.3 Test Instrument

The test instrument was a written grammaticality judgement task with 71 items (See Appendix). The participants were asked to read sentences and rate the grammaticality of them on the 5-point scale indicated. The sentences fell into the following 3 groups:

- (1) Sentences which involve grammatical relative clauses with *wh*-operator (8 items), complementiser *that* (5 items) and null operator or complementiser (4 items), and ungrammatical ones with *who(m) that* or *which that* (5 items) and resumptive pronoun (5 items)
- (2) Sentences which display grammatical *wh*-questions (8 items) and ungrammatical ones with no subject- auxiliary inversion (8 items)
- (3) Sentences which violate Subjacency conditions in the following 5 construction types with relative clauses (2 items) *wh*-questions (2 items), and grammatical declarative

sentences from which the operators are extracted (2 items):

- (a) Extraction from a relative clause
- (b) Extraction from a sentential subject
- (c) Extraction from an adjunct
- (d) Extraction from a complex NP (DP)
- (e) Extraction from an embedded question (i.e. *wh*-island)

The participants were required to judge the grammaticality of each sentence by circling one of the numbers on the scale (-2 -1 0 1 2). They were told that +2 meant that the sentence was 'completely grammatical', -2 means that it was 'completely ungrammatical', and -1, 0 and +1 were gradations between the extremes to be used if they thought the sentence was more or less grammatical. Detailed instructions were given on the use of the scale prior to testing, and there were initial practice items for information before the test began. Participants were given ten seconds to judge each sentence.

3.4 Data Analysis Procedures

Individuals' scores for each sentence were summed and the means calculated. In the analysis process, we measured the distance of learners' judgments from the correct answers and converted their judgments to points (0 to 4). Therefore, on the sentences in the test which were presumed to be grammatical at the outset of the study, participants' responses were scored in the following way:

	Raw score	Converted Score
completely grammatical	+2	4
Probably grammatical	+1	3
Not sure	0	2
Probably ungrammatical	-1	1
completely ungrammatical	-2	0

On the sentences in the test which were presumed to be ungrammatical at the outset of

the study, participants' responses were scored in the following way:

	Raw score	Converted Score
completely grammatical	+2	0
Probably grammatical	+1	1
Not sure	0	2
Probably ungrammatical	-1	3
completely ungrammatical	-2	4

Comparisons were made between advanced Japanese L2 learner and native speaker responses for each item, and between relative clauses and *wh*-questions, using a one-way ANOVA.

3.5 Results and Discussion

The reliability coefficient (Cronbach's α) of the grammaticality judgement test used in this study was 0.825, which means that the test used is fairly reliable. In both grammatical and ungrammatical *wh*-questions, participants' mean scores should approach 4 (maximum score) if they judge correctly, and their mean scores should approach 0 (minimum score) if they judge incorrectly. Significant differences between Japanese and native speakers' responses on the basis of one-way ANOVAs with rating of grammaticality as the dependent variable and participants' L2 proficiency level as the independent variable are indicated by an asterisk.

3.5.1 Knowledge of the Surface Morphological Properties of *Wh*-questions

The results of the grammatical and ungrammatical *wh*-questions are presented in Tables 2 and 3, respectively. The results show that there are no significant differences in mean scores between the advanced group and natives in all the grammatical and ungrammatical *wh*-questions, meaning that adult Japanese L2 learners who have reached the advanced proficiency level perform within the range of native speakers of English in rating surface morphological properties of *wh*-questions.

Table 2 Grammatical *wh*-questions in English

Group	Mean	SD
Elementary	2.656*	0.495
Low-intermediate	2.871*	0.561
Intermediate	2.910*	0.554
High-intermediate	3.216*	0.550
Advanced	3.328	0.495
Native control	3.656	0.358

* = significantly different from native controls ($p < .01$ or $p < .05$)

Table 3 Ungrammatical *wh*-questions without subject-auxiliary inversion in English

Group	Mean	SD
Elementary	1.791*	0.609
Low-intermediate	1.967*	0.685
Intermediate	2.454*	0.836
High-intermediate	2.864*	0.872
Advanced	3.047	0.732
Native control	3.547	0.440

* = significantly different from native controls ($p < .01$ or $p < .05$)

3.5.2 Knowledge of the Surface Morphological Properties of Relative Clauses

The results of the grammatical relative clauses with *wh*-operator, complementiser *that* and null operator or complementiser are presented in Tables 4, 5 and 6, respectively. The results of the ungrammatical relative clauses with *who(m) that* or *which that* and resumptive pronoun are given in Tables 7 and 8, respectively. These tables compare the mean scores for six groups. The results show that there are no significant differences in mean scores between the high-intermediate group (taken as a whole) and natives and between advanced group and natives in all the grammatical and ungrammatical relative clauses. This means that adult Japanese L2 learners who have reached, at least, the high-intermediate proficiency level perform within the range of native speakers of

English in rating surface morphological properties of relative clauses.

Table 4 Grammatical relative clauses involving a *wh*-operator in English

Group	Mean	SD
Elementary	1.980*	0.577
Low-intermediate	2.316*	0.672
Intermediate	2.821*	0.753
High-intermediate	3.557	0.434
Advanced	3.594	0.452
Native control	3.648	0.414

* = significantly different from native controls ($p < .01$ or $p < .05$)

Table 5 Grammatical relative clauses involving *that* in English

Group	Mean	SD
Elementary	2.254*	0.682
Low-intermediate	2.377*	0.759
Intermediate	2.570*	0.734
High-intermediate	3.048	0.621
Advanced	2.950	0.805
Native control	3.575	0.326

* = significantly different from native controls ($p < .01$ or $p < .05$)

Table 6 Grammatical relative clauses involving a null operator and a null complementiser in English

Group	Mean	SD
Elementary	1.988*	0.675
Low-intermediate	2.247*	0.698
Intermediate	2.424*	0.691
High-intermediate	2.758	0.683
Advanced	2.656	0.611
Native control	3.422	0.546

* = significantly different from native controls ($p < .01$ or $p < .05$)

Table 7 Ungrammatical relative clauses involving a doubly-filled complementiser (*wh(m) that* or *which that*) in English

Group	Mean	SD
Elementary	2.402*	0.736
Low-intermediate	2.625*	0.791
Intermediate	2.765*	0.755
High-intermediate	3.382	0.780
Advanced	2.800	0.614
Native control	3.525	0.619

* = significantly different from native controls ($p < .01$ or $p < .05$)

Table 8 Ungrammatical relative clauses involving resumptive pronouns in English

Group	Mean	SD
Elementary	1.875*	0.652
Low-intermediate	2.019*	0.840
Intermediate	2.852*	0.759
High-intermediate	3.406	0.670
Advanced	3.550	0.791
Native control	3.538	0.460

* = significantly different from native controls ($p < .01$ or $p < .05$)

3.5.3 Knowledge of *Wh*-movement in Subjacency Violations

Results of Subjacency violations rated by Japanese L2 speakers of English and natives are presented in Tables 9 to 13. These tables crucially show that there are no significant differences in mean scores between the advanced group and the native control group in grammatical and ungrammatical (both relative and *wh*-question) cases, with the exception of *wh*-movement out of an embedded question (*wh*-island) in relative clauses.

Table 9 *Wh*-movement out of a relative clause in English

Group	Ungrammatical			
	Relative clause		<i>Wh</i> -movement	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Elementary	1.827	0.999	1.529	0.794
Low-intermediate	1.958	1.132	1.755	0.951
Intermediate	2.554	0.950	2.359	1.026
High-intermediate	2.909	1.107	2.788	1.031
Advanced	3.375	0.518	3.375	0.582
Native controls	3.844	0.301	3.969	0.125

Table 10 *Wh*-movement out of a sentential subject (subject island) in English

Group	Grammatical		Ungrammatical			
	<i>Mean</i>	<i>SD</i>	Relative clause		<i>Wh</i> -question	
			<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Elementary	1.788	1.061	1.697	0.966	1.577	0.980
Low-intermediate	2.057	0.951	2.135	1.050	2.099	0.959
Intermediate	2.109	0.983	2.837	0.907	2.663	0.995
High-intermediate	2.515	1.272	3.091	0.972	2.833	1.123
Advanced	3.125	1.356	3.313	0.704	3.375	0.641
Native controls	3.031	0.741	3.219	1.016	3.406	0.800

Table 11 *Wh*-movement out of an adjunct island in English

Group	Grammatical		Ungrammatical			
	<i>Mean</i>	<i>SD</i>	Relative clause		<i>Wh</i> -question	
			<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Elementary	3.106	0.861	1.327	0.932	1.697	0.994
Low-intermediate	3.339	0.826	1.568	0.986	1.839	1.058
Intermediate	3.109	0.930	2.196	1.030	2.109	1.080
High-intermediate	3.591	0.723	2.591	1.247	3.136	0.929
Advanced	3.313	1.387	2.063	0.776	3.063	0.943
Native controls	3.375	0.806	3.063	0.873	3.906	0.202

Table 12 *Wh*-movement out of an embedded question (*wh*-island) in English

Group	Grammatical		Ungrammatical			
	<i>Mean</i>	<i>SD</i>	Relative clause		<i>Wh</i> -question	
			<i>Mean</i>	<i>SD</i>	<i>Man</i>	<i>SD</i>
Elementary	2.543	0.963	1.601	1.018	2.288	0.803
Low-intermediate	2.474	1.047	1.505	1.040	1.995	1.030
Intermediate	2.880	1.146	1.489	1.240	2.130	1.035
High-intermediate	3.652	0.619	1.621	1.104	2.606	0.899
Advanced	3.313	1.361	1.625	1.157	2.813	0.704
Native controls	3.750	0.483	3.813	0.250	3.938	0.171

Table 13 *Wh*-movement out of a complex NP in English

Group	Grammatical		Ungrammatical			
	<i>Mean</i>	<i>SD</i>	Relative clause		<i>Wh</i> -question	
			<i>Mean</i>	<i>SD</i>	<i>Man</i>	<i>SD</i>
Elementary	2.841	0.909	1.683	0.842	1.668	0.967
Low-intermediate	3.000	0.852	1.651	0.960	1.755	1.078
Intermediate	3.174	0.851	2.283	1.009	2.000	1.006
High-intermediate	3.394	0.974	2.379	1.244	2.636	1.214
Advanced	3.250	1.035	2.438	1.016	3.188	1.033
Native controls	3.813	0.403	3.625	0.532	3.719	0.364

It appears, then, that on the basis of their judgements of the grammaticality and ungrammaticality of sentences involving long-distance operator movement, 'advanced' Japanese learners of English have acquired feature-driven movement. In other words, they have acquired a feature [+R] as well as functional category C in order to construct information questions and relative clauses in English. Their accurate interpretations of English relative clauses and questions increased in accordance with development in overall English proficiency, and when their overall English proficiency develops to the advanced level, they seem to have the same underlying representation as native speakers of English in constructing information questions and relative clauses even if they do not have a feature [+R] in their L1, i.e., Japanese. This is against the 'representational

deficit hypothesis' proposed by Hawkins (1998, 2000, 2003) and Hawkins and Chan (1997).

4 Conclusion

The finding of this study is that there was a proficiency-related increase in possible correct judgement. Adult Japanese EFL learners showed the same understanding of relative clauses as native speakers when they reached the post-intermediate level and the same understanding of *wh*-questions as native speakers when they arrived at the advanced level. There is a difference in their rating of the surface morphological properties between relative clause and *wh*-questions, both of which utilise *wh*-movement. However, further research is needed to explain this difference. The results also support the Minimal Trees Hypothesis, advocated by Vainikka and Young-Scholten (1994, 1996a, 1996b, 1998a, 1998b, 2002), which proposes that, like L1 learners, adult L2 learners gradually build up syntactic structure from lexical to functional projections.

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Appendix: Sentences used in the (off-line) Grammaticality Judgement Test

(1) Grammatical relative clauses involving a *wh*-operator

1. The young man who always helped us was named George. (S)
2. The boy who(m) I kicked yesterday broke the window. (O)
3. The girl for whom I have bought a computer is my sister. (IO)
4. The woman from whom I received a present is in London. (OBL/Pied-piping)
5. The box which they kept their money in has been stolen. (OBL/Stranding)
6. The man whose feet are very big has bought new shoes. (GEN/S)
7. The woman whose son you met last night is a good actress. (GEN/O)

8. The man whom Paul runs faster than is a baseball player. (OCOMP)

(2) Grammatical relative clauses involving *that*

9. The student that wrote this letter must be very crazy. (S)

10. The young lady that I employed last month works hard. (O)

11. The woman that Charles gave a gift to looked very happy. (IO)

12. The picture that you are looking at was painted by Picasso. (OBL)

13. The friend that I am taller than does not play basketball. (OCOMP)

(3) Grammatical relative clauses involving a null operator and a null complementiser

14. The house you can see over there was built ten years ago. (S)

15. The friend they lent money to bought a very big house. (D)

16. The magazine we got the information from is useful. (OBL)

17. The girl I sing better than has decided to study abroad. (OCOMP)

(4) Ungrammatical relative clauses involving *who/whom/which that*

18. *The woman who that is singing on the stage is my wife. (S)

19. *The mirror which that Judy broke was very expensive. (O)

20. *The cats which that I gave the milk to were very small. (IO)

21. *The woman whom that we talked with was our teacher. (OBL)

22. *The boy whom that I studied harder than passed the exam. (OCOMP)

(5) Ungrammatical relative clauses involving resumptive pronouns

23. *The building that it stands near the lake is our hotel. (S)

24. *The classmate that you don't like him is very unkind. (O)

25. *The student that I lent the book to her studied hard. (IO)

26. *The city that my uncle came from it is far from here. (OBL)

27. *The trees that you are shorter than them are falling down. (OCOMP)

(6) Grammatical *Wh*-questions

28. Who came to see you last night?

29. What did the woman decide to do for her daughter?

30. What did your girlfriend want to talk about?
31. Whose shoes are you going to borrow today?
32. When did your son go to Paris to study French?
33. Why was Andy surprised to receive the letter from Tom?
34. Who(m) does the woman know that Janet loved?
35. What language is it necessary for Bob to learn?

(7) Ungrammatical *Wh*-questions without subject-auxiliary inversion

36. *Who your favorite baseball player is?
37. *What the woman and her husband wanted to do?
38. *What your grandfather complained about?
39. *Whose house Sandy's father is going to build?
40. *Why the mother was worried about her son?
41. *Where Catherine got such a great idea?
42. *Which medal it was possible for Mark to win?
43. *Which country you believe that Japan attacked?

(8) *Wh*-movement out of a relative clause

44. *This is the lady who(m) Steve wrote the book which describes. (O)
45. *This is the bicycle which the police caught the man who stole. (O)
46. *What did the reporters interview the politician who criticized? (O)
47. *What did your parents visit a restaurant which served? (O)

(9) *Wh*-movement out of a sentential subject (subject island)

48. To discover that Frank has cancer was no surprise to his father.
49. That Tom goes to college is a heavy burden for his parents.
50. *This is the ghost which a picture of frightened the children. (OBL)
51. *This is the meeting which for Bill to attend shocked his parents. (O)
52. *What did a serious discussion of occur during the meeting? (OBL)
53. *Who(m) did that my sister went out with make John angry? (OBL)

(10) *Wh*-movement out of an adjunct island

54. Many houses were damaged by the storm while I visited England.

- 55. You have to be prepared for the exam before watching TV.
- 56. *This is the homework which Lucy went to school without doing. (O)
- 57. *This is the girl who(m) the bell rang while I was thinking of. (OBL)
- 58. *Which car did the child cross the street when the driver stopped? (O)
- 59. *Who(m) did an earthquake occur while you were talking with? (OBL)

(11) *Wh*-movement out of an embedded question (*wh*-island)

- 60. Sally watched how Mrs(.) Southgate made sandwiches.
- 61. William asked me who had caused the car accident.
- 62. *This is the girl who(m) Mike told me when he visited. (O)
- 63. *This is the CD which Peter knows where Tom bought. (O)
- 64. *Which car did Mary ask John when he bought? (O)
- 65. *What did Rebecca wonder who would believe? (O)

(12) *Wh*-movement out of a complex NP

- 66. Susie questioned the decision that we should sell the land.
- 67. Peter heard the news that his best friend would get married.
- 68. *This is the house which we heard the news that Dick bought. (O)
- 69. *This is the boy who(m) Jack described the way that Bill hit. (O)
- 70. *Which book did the teacher believe the claim that Jim stole? (O)
- 71. *Who(m) did Thomas know the fact that David killed? (O)

第2部

日本人英語学習者の関係代名詞節構文・疑問構文の 処理過程の解明に関する研究

1 はじめに

第1部では、日本語母語話者の英語の習得において普遍文法の原理が有効であるかを、wh疑問構文と関係代名詞節構文を対象として調査した結果を報告した。実験はオフライン（文法性判断テスト）法を用いて行われ、日本語母語話者は英語熟達度が上級レベルに達すると、wh疑問構文と関係代名詞節構文を英語母語話者と同様の過程を用いて理解していることが明らかになった。つまりwh移動を用いてそれらの構文を理解している（従って、普遍文法が有効であると言える）。これは文法的な文を正しく判断できただけでなく、普遍文法（Universal Grammar: UG）の原理（principle）である下接の条件（Subjacency）に違反した文を（母語話者と同じように）正しく排除していたことによる。これはまた、下接の条件（Subjacency）はwh移動に関わる制約であり、関係代名詞節構文とwh疑問構文においてwh移動を可能にしている（母語の日本語には存在していない）形式素性（formal feature）を習得できたことを意味している。

しかしながら、Marinis (2003)が指摘するように、学習者が第二言語をどのようにオンラインで（on-line）処理するかは、あまり知られていないようである。言語処理とは、学習者がリアルタイム（real time）で語や文を読んだり聞いたりしている間に含まれる心的処理（mental process）であり、「解析」（parsing）とも言われている。

Marinis (2003)は第二言語習得研究におけるオンライン実験の必要性および重要性を以下のように述べている。すなわち、これまでに多くの研究が、オンライン法を用いて、母語話者がどのようにリアルタイムで文を処理するかを調査し、十分成熟した読み手はあらゆる言語において同じような処理方略を用いているわけではないことが明らかになってきた。言語間の相違は、言語の文法システムだけでなく、言語処理メカニズムにも及んでいるのである。母語（第一言語）に関するこのような調査結果が意味することは、第二言語学習者は単に第二言語の文法を習得すればよいということではなく、学習している第二言語の処理方略（processing strategy）が、学習者が母語において発達させてきたものとは異なっている場合、その第二言語独自の処理方略を発見しなければならないということである。従って、第一言語学習者と第二言語学習者の間の言語熟達度の相違や第二言語学習者が母語話者の言語能力に届かないのは、第二言語学習者の目標言語の処理方略の習得に失敗した結果であり、第二言語の文法を習得することが出来なかったためではないかもしれない。

この問題に関して、Marinis (2003)は、文法的な困難さと処理的な困難さのどちらが、第二

言語学習者が *wh* 移動を含む文の文法性を正しく判断することを困難にするかという課題に対して、オンライン実験による調査がその決定的な証拠を示すと述べている。しかしながら、このような視点から行われた研究は極めて少ないのが現状である (Juffs and Harrington, 1995, 1996 など)。

2 先行研究の概観

前述の通り、第二言語習得における UG の有効性を研究の背景として、オンライン実験を用いて文法的な困難さと処理的な困難さを調査した第二言語習得研究は極めて少ない。その中でも、本研究に特に関連しているものに Juffs and Harrington (1995, 1996)がある。以下で詳しく観ていきたい。

Juffs and Harrington (1995, 1996)は、まず、これまで行われてきた第二言語習得における普遍文法の原理 (ここでは下接の条件 (Subjacency)) の有効性に関する研究を概観し、これらの研究の問題点をまとめている。本研究に関係することとしては、これまでの研究で用いられてきたオフラインによる文法性判断テストにおいて、第二言語学習者のある文法構造におけるパフォーマンスが母語話者に比べて劣っているのは、文法能力の欠如と言語処理上の困難さのどちらを反映しているのか分からないということである。当然ながら、彼らは、前提として処理 (解析) と文法は原則的には独立しているものと見なしている。

上記のことに基づき、Juffs and Harrington (1995, 1996)は25人の中国人英語学習者 (アメリカに住む上級レベル) と25人英語母語話者 (全て大学生) を対象に、長距離 (long-distance) の主語抽出 (subject extraction) と目的語抽出 (object extraction) を含む文法のおよび非文法的 (下接の条件 (Subjacency) の違反) な疑問文のリーディングタイム (reading time) を測定した。実験は、例えば(1)のような不定詞構文から主語を抽出した文法的な文を逐次単語を提示 (word-by-word reading) する方法 (実験参加者のペース読み: self-paced reading) であった。これは「移動窓の提示法」(moving window display technique) と呼ばれるものである (詳細は後述)。(2)は他に用いられた文法的 (5種類) および非文法的 (*で示されている4種類) な文である。刺激文は各タイプに6文ずつ、合計で54文であった (ダミー文を合わせると全部で114文)。

(1) *Who_i does Tome expect *t_i* to fire the manager? (infinitival, subject extraction)*

- (2) *Who does Sam deny the story that he kissed ___? (complex noun phrase island)
 *What did Sam see the man who stole ___? (relative clause island)
 *Who did you meet Tom after you saw ___? (adjunct island)
 *Who did a story by ___ please the children? (subject island)
 Who did Ann say ___ likes her friend? (finite, subject extraction)
 Which man did Jane say her friend likes ___? (finite, object extraction)
 Which man did Jane say that her friend likes ___? (finite, object extraction with *that*)
 Who does Tom expect to fire ___? (infinite, object extraction)

研究課題は、(1) 成人中国人英語学習者（上級）は文法性の判断において英語母語話者と同様のパフォーマンスを示すか、および(2) 文法性の判断において解析に基づく困難性への証拠があるか、であった。

結果として、例えば(1)では、英語母語話者は不定詞の **to fire** の後のリーディングタイムが増したが、中国人英語学習者においては逆に減少した。リーディングタイムの増加は、その部分で再分析 (reanalysis) することを示している。従って、中国人英語学習者は **to fire** の部分で再分析の過程を経ないことになる。すなわち、統語における **wh** 移動を持たない言語（この場合は中国語）を母語とする第二言語学習者の（文法性判断の）正確さの低さは、言語能力の低さにあるのではなく、処理の困難さにある。なぜなら、下接の条件に違反した文の正確な判断は英語母語話者と違いはなかったからである。

今後の課題として、Juffs and Harrington (1995, 1996)は次の2点を挙げている。1点目は日本語や韓国語のように完全に **wh** 移動が存在しない、かつ **SVO** の語順の言語を第1言語とする英語学習者を実験参加者とする。また、比較として、英語と同様な特徴を持った言語を第1言語とする英語学習者を実験参加者とする。2点目は、(3)や(4)に示すように、刺激文を修正する必要があること。特に(3)のように **wh** 語句が移動してきた後の空所の後ろに語彙的要素を付け加えることによって、構文からその空所が目的格の位置であることを容易に推測することを避けることができる。

(3) Who does Tom expect to fire ___ next week after the audit?

(4) Who did John persuade to go to the party?

このように、オンライン実験による文処理の測定は、UG を理論的枠組みとして用いる第二

言語習得研究において心的表示 (mental representation) に関する主張を調査するための重要な実験方法である。

以上が Juffs and Harrington (1995, 1996)の研究の概要であるが、更に、Juffs (2005) は Juffs and Harrington (1995, 1996)で述べられた課題を解決するための実験を行った。実験参加者は英語を第二言語として学んでいる中国語話者 (30人)、日本語話者 (28人)、そしてスペイン語話者 (46人)であった。実験参加者はいずれも上級英語学習者であり (ただし、日本語話者は中国語話者とスペイン語話者より若干劣る)、Juffs and Harrington (1995, 1996)で用いられた実験と同様な方法 (word-by-word, self-paced moving window technique) で調査された。

結果は Juffs and Harrington (1995, 1996)の結果とある程度同じであった。すなわち、実験参加者は文法的な wh 抽出を含む文と非文法的な wh 抽出を含む文の違いに敏感に反応していた。この点においては、英語母語話者の反応と似ている。しかしながら、第二言語における wh 移動のオンライン処理がうまくいくか否かは、実験参加者の第一言語によるところもあることが示された。課題として、ワーキングメモリーの問題をどのように扱うか、などが残された。

上記の研究の他にも、Dussias (2003)や Papadopoulou and Clahsen (2003)などが、上級英語学習者が曖昧な関係代名詞節構文 (例えば、*Peter fell in love with the daughter of the psychologist who studied in California*のように、*who studied in California* が *daughter* と *psychologist* のどちらを修飾しているか曖昧な文) をどのように理解するのかを調査するためにオンライン実験を用いている。当然ながら、これらの研究は第1言語における研究がその基盤となっている。第1言語においては、英語 (Carreiras and Clifton, 1999; Cuetos and Mitchell, 1988; Frazier, 1978; Frazier and Clifton, 1996; Gibson, Pearlmutter, Canseco-Gonzalez, and Hickock, 1996; Kimball, 1973) のみならず、スペイン語 (Cuetos and Mitchell, 1988)、ドイツ語 (Hemforth, Koneicznny, and Scheepers, 2000; Hemforth, Koneicznny, Scheepers, and Strube, 1997)、オランダ語 (Brysbaert and Mitchell, 1996)、および日本語 (Kamide and Mitchell, 1997) で実験が行われてきた (本研究とは直接関係しないため、それらの概観については省略する)。

また、第二言語習得における心理的実存性 (psychological reality) の問題を取り扱った研究においてもオンライン実験が用いられてきた。心理的実存性とは、我われが実際に言語を

話したり聞いたりする時、我われの心（脳）の中で心理的（抽象的）に言語が存在するものと考えられることである。これは、「怒り」や「悲しみ」のように、物理的に示すことはできなくても、確かに心の中に「在る」としか言いようのないものがある（郡司・坂本，1999）。このような心理的実存性を我われが持つかどうか、痕跡（trace）に関して議論されてきた。第1言語としての英語（の受動文）において、Bever and McElree (1988)が、語句が移動した後に残った痕跡にはある種の実存性があると報告している（Love and Swinney, 1996; Nicol and Swinney, 1989）。第二言語における同様の問題に関しては、Marinis, Robert, Felser and Clahsen (2003, 2005) がある（ここでも、本研究とは直接関係しないため、それらの概観については省略する）。

Clahsen and Felser (2006a, 2006b)は、第二言語学習者の文法処理に関する研究の包括的な概観を行っている。彼らは、言語インプットをリアルタイムで処理する能力は言語習得の成功にきわめて重要であるが、言語学習者がどのようにリアルタイムで言語を理解・産出するかはほとんど知られていないと述べている。このような状況の中で彼らは心理言語学的な実験方法を用いて第一言語と第二言語における文法処理やその処理の比較に関する調査をきめ細かく行ってきた。結果として、成人第二言語学習者の処理において、母語話者との決定的な相違が文処理の領域において観察されたことを報告している。すなわち、成人第二言語学習者は母語話者と同じように言語処理において語彙・意味の手がかり（lexico-semantic cue）に導かれているが、統語的情報（syntactic information）においてはほとんど導かれていないことが明らかになった。Clahsen and Felser (2006a, 2006b)は、このような第1言語と第二言語の相違は、成人第二言語学習者が言語理解の際に計算する統語的表示（syntactic representation）が母語話者のものより浅く、より簡潔になっているからであると仮定すると説明ができると述べている。従って、成人第二言語学習者が持つ統語的表示は母語話者のものとは異なっていることになる。このことは、第1部で示した、成人日本人英語学習者は上級レベルになると母語話者の統語的表示を習得できるという見解に反するものであり、Hawkins (1998, 2000, 2003) and Hawkins and Chan (1997) が提案した representational deficit hypothesis を支持するものである。

2 実験方法

第1部で述べたように、日本語母語話者は英語熟達度が上級レベルに達すると、wh 疑問構文と関係代名詞節構文における文法的な文を正しく判断できただけでなく、UGの原理で

ある下接の条件 (Subjacency) に違反した文を (母語話者と同じように) 正しく排除することができ、英語母語話者と同様、wh 移動を用いて wh 疑問構文と関係代名詞節構文を理解していることが明らかになった。

本実験の目的は、日本語とは生成過程が大きく異なり、そのために学習が比較的困難であると言われている「関係代名詞節構文」と「wh 疑問構文」に焦点をあて、それらの構文を理解する反応時間を測定するオンライン (on-line) 実験を用い、英語母語話者との比較を通して第二言語学習者の文処理 (解析) 過程を明らかにすることである。

これまで、言語心理学の分野では、パソコンの画面などに視覚 (文字) 提示された刺激に対する反応時間 (reaction/response time) や正解率等を指標とする実験が数多く行われてきた。郡司・坂本 (1999) によれば、これらの実験は、「被験者ペース読み」(self-paced reading) と「実験者ペース読み」(experimenter-paced reading) に大きく分けられる。

本実験で用いる「被験者ペース読み」は、実験参加者がボタンやキーを押すと、刺激 (文、文節、語句、形態素など) が次々とあらわれるという方式である (郡司・坂本, 1999)。これは、その要素ごとの読みの時間を計測して、どの要素を読んだときに遅延が生じるのかを調べるものである。多くの場合、刺激を提示した後に、実験参加者が読んだ文の内容理解に関する Yes/No 疑問などを与える。

例えば、下の文(1)は、who(m)が employ の後から移動した文法的な文であるが、この文を正しく理解するためには、employ の後に who(m) (あるいは the lady) が (見えない形で) 存在していること (心理的実存性) を再分析 (reanalysis) しなければならない。文(2)は、which が bought の後から長距離移動することが許されないため、非文法的な文である。しかしながら、英語母語話者は bought の後に which (あるいは the house) が存在できるか再分析を行って確認するはずである。

(1) The lady who(m) I employed ____ last month works hard.

(2) This is the house which we heard the news that Dick bought _____.

従って、第二言語学習者が文(1)のような構文を正しく文法的であると判断し、文(2)のような構文を正しく排除できたことが wh 語の移動の制約を正しく理解し、英語母語話者と同じような wh 語の移動を用いて関係代名詞構文と wh 疑問構文を理解している証拠にはならな

い。なぜなら、文(2)のような構文では、文が複雑なゆえに理解が難しく、そのことによって非文法的と判断している可能性があるからである。

2. 1 実験文

実験に用いられる刺激文は、第1部で用いられたものと同じタイプの文である（全体で71問）。この理由は、オフライン実験で得られた結果がオンライン実験のおいても支持されるかを見るためである。ただし、オンライン実験では、修飾語句などをあまり使わないようにする。これは実験の目的以外のところで（例えば語彙的なもの）実験参加者の理解を妨げることを避けるためである。

実験に用いられる関係代名詞節構文は、主格 (subject: S), 直接目的格 (direct object: O), 間接目的格 (indirect object: IO), 前置詞の目的格 (object of preposition: OBL), 所有格 (genitive: GEN) および比較の目的格 (object of comparison: OCOMP) の6種類である。また、wh 疑問構文は、主格 (subject: S), 直接目的格 (direct object: O), 前置詞の目的格 (object of preposition: OBL), 所有格 (genitive: GEN), 場所 (where), 理由 (why), 時 (when) および長距離移動 (long-distance) の8種類である。提示される関係代名詞節構文と wh 疑問構文は次のような構造（および例題）である（*は非文法的であることを示す）。

- (1) wh 演算子 (wh-operator) を含む文法的な関係代名詞節構文 (8問)

The man who helped you was named Hiroshi.

The man who(m) you kicked broke the window.

- (2) 補文標識 that を含む文法的な関係代名詞節構文 (5問)

The man that wrote this letter must be crazy.

The lady that I employed last month works hard.

- (3) 空演算子/空補文標識 (null operator or complementiser) を含む文法的な関係代名詞節構文 (4問)

The house you can see over there was built last year.

The man they lent money to bought a big house.

(4) who(m) that あるいは which that を含む非文法的な関係代名詞節構文 (5 問)

*The woman who that is singing my sister.

*The mirror which that Hiroshi broke was expensive.

(5) 再叙代名詞 (resumptive pronoun) を含む非文法的な関係代名詞節構文 (5 問)

*The building that it stands near the river is our hotel.

*The man that you don't like him is very unkind.

(6) 文法的な wh 疑問構文 (8 問)

Who came to see you last night?

What did Hiroshi decide to do for his son?

What did Junko want to talk about?

(7) 主語と助動詞の倒置 (subject-object inversion) が行なわれていない非文法的な wh 疑問構文 (8 問)

*Who your favorite baseball player is?

*What Junko and Hiroshi wanted to do?

*What Hiroshi complained about?

(8) 次の5つのタイプの構造において下接の条件 (Subjacency) に違反した文。関係代名詞節構文 (2 問), wh 疑問構文 (2 問), および演算詞が抽出された文法的な平叙文 (2 問)。

・関係節 (relative clause) からの wh 移動

*This is the lady who(m) Junko wrote the book which describes.

*What did Junko interview the man who criticized?

・文主語 (sentential subject) からの wh 移動

To discover that Hiroshi has cancer was no surprise to her.

*This is the ghost which a picture of frightened the children.

*What did a serious discussion of occur during the meeting?

・付加部 (adjunct island) からの wh 移動

Many houses were damaged by the storm while I visited Niigata.

*This is the homework which Junko went to school without doing.

*Which car did Junko cross the street when Hiroshi stopped?

・埋め込み疑問 (embedded question) からの wh 移動

Junko watched how Tomoko made sandwiches.

*This is the girl who(m) Hiroshi told me when he visited.

*Which car did Hiroshi ask Junko when he bought?

・複合名詞句 (complex NP) からの wh 移動

Junko questioned the decision that we should sell the car.

*This is the house which we heard the news that Junko bought.

*Which car did Junko believe the claim that Hiroshi stole?

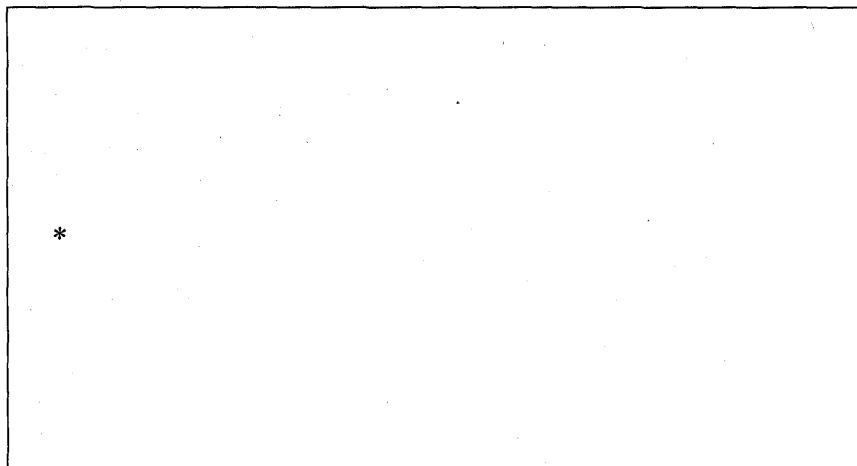
なお、実験で使われる全ての文および実験の指示文は Appendix に示してある。

2. 2 実験手順

本研究では、第二言語習得における文法発達過程の調査を、これまで一般的に用いられてきた文法判断テストではなく、コンピューターを用いたオンライン実験によって理解の反応時間を測定し、その反応時間の相違に基づいた言語処理過程の説明を行う。

実験は、実験参加者のペース読み (self-paced reading) による手法を用いる。この手法は、実験参加者がボタンを押すごとに、例えば、This / is / the car / which / the police / caught the man / who / stole とスラッシュで区切られた語 (句) が順番にコンピューターの画面に提示され (ボタンを押すと前の語 (句) は消える)、それぞれの語 (句) を理解するのに要した時間が反応時間として測定されるものである。語句が現れる位置は文中の本来の位置であるため、実験参加者からは、1文全体を左から右へと次々に開いては閉じていく窓を眺めているように見える (郡司・坂本, 1999)。この手法 (moving window reading technique) によって、the man who stole を理解する場合は which (あるいは the car) を再分析する必要があるため、(wh 語の移動を用いて理解している場合) ボタンを押すのが他の語 (句) を理解する場合より遅くなると予想される。

以下に実際の例を示す。実験参加者がコンピューターの前に座り、まず最初にキーを押すとスクリーンに * が現れ、これから文が始まることを知らせる。次にキーを押すと * は消え語句が現れる。もう一度キーを押すまでこの語句はスクリーン上に出ている。次にキーを押すことによって前の語句が消え次の語句と入れ替わる。最後に文の終わりを示すために再度 * が現れる。そして、実験参加者は読んだ文が文法的であるか非文法的であるか判断する。実験は SuperLab を用いて行われる。



This

is

the car

which

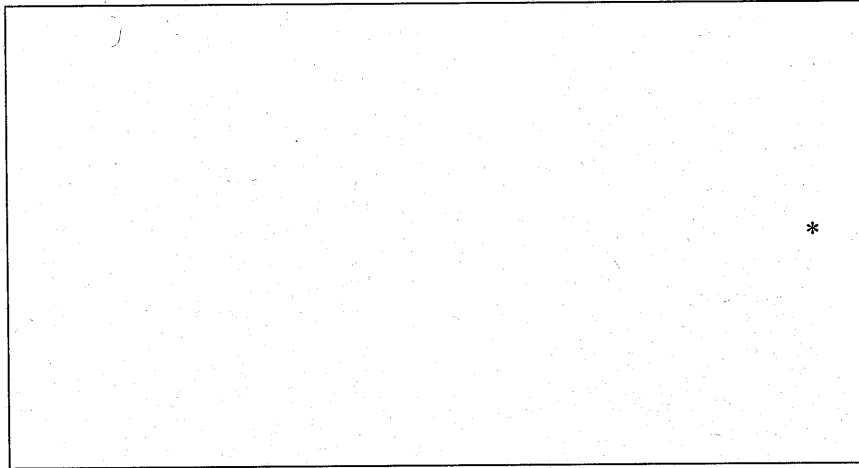
the police

caught

the man

who

stole



最後の文法性を判断させる質問や文の内容に関する yes/no 質問を行うのは、実験参加者に、それぞれの語句や文の内容に注意を払わせ、注意力を持続させるためである。

実験はテスト・セッションの前に練習セッションを設定し、実験参加者が実験方法を理解したかを確認する。また、出来るだけ実験後にフォローアップ・インタビューを行う。これは、実験参加者に意味の分からなかった単語はなかったか等の問題を確認するためである。

2. 3 今後の課題

有効かつ信頼できるデータを十分集めることができず、結果を一般化するには至らなかった。実験においては、wh 移動の部分の再分析以外の箇所でも反応時間が随分かかることが予想される。特に、初級や中級英語学習者の場合、一語（句）一語（句）に随分と時間をかけて理解しようとするため、反応時間の測定実験には難しいと思われる。

実際の実験では、「はしがき」でも述べたように、報告者の機器への不慣れさから、刺激文の設定に時間がかかってしまい、予備実験の段階で報告書をまとめなければならなくなった。また、特に大きな問題となったのは実験参加者の確保であった。実験参加者の英語熟達度を Oxford Placement Test (OPT) (Allan, 1992)を用いて測定する予定であったが、上級英語学習と思われる学習者を見つけることが困難であった。また、いろいろな制約（手続きや実験時間などの問題）から、韓国語母語話者や中国語母語話者、そして統制群としての英語母語話者の実験参加者を確保するにも困難を要した。

このように、予備実験の設定段階において多くの困難を抱えてしまい、研究期間内に第二言語習得研究や外国語教育研究（特に、日本人のための英語教育研究）に十分に貢献できるような成果を出すことはできなかった。本研究では所期の目標を達成することが出来ず、またそこへたどり着くまでの実験も思ったように出来なかった。従って、残された課題も多く、更に継続して実験参加者の確保と実験方法の精選をはかり、第二言語習得のメカニズムの解明を目指して確実な調査を続けていくことが必要であり、そのための研究計画を現在立て直しているところである。このような研究の成果は、必ずや日本の英語教育の発展に寄与すると思われる。更に精進していきたい。

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Appendix: Instruction and Stimuli

Instructions

Speakers of a language seem to develop a 'feel' for what is a possible sentences, even in the cases where they have never been taught any particular rules. For example, in English, you might feel that sentence (a) and (c) sound like possible sentences, whereas (b) and (d) do not.

- a. Junko is likely to win the race.
- b. Junko is probable to win the race.
- c. It seems that Hiroshi is late.
- d. Hiroshi seems that he is late.

In this experiment, you will read sentences word by word (or phrase by phrase) on a computer screen. Concentrate on how you feel about these sentences. Native speakers of English often have different intuitions about such sentences, and there are no right or wrong answers. Tell us for each one whether you think it sounds possible or impossible in English.

Stimuli

(1) Grammatical relative clauses involving a *wh*-operator

1. The man who helped you was named Hiroshi. (S)
2. The man who(m) you kicked broke the window. (O)
3. The lady for whom I have bought a book is my sister. (IO)
4. The lady from whom I received a letter is in Tokyo. (OBL/Pied-piping)
5. The bag which I kept my money in has been stolen. (OBL/Stranding)
6. The man whose feet are big has bought new shoes. (GEN/S)
7. The man whose son you met last night is a doctor. (GEN/O)
8. The man whom you run faster than is a teacher. (OCOMP)

(2) Grammatical relative clauses involving *that*

9. The man that wrote this letter must be crazy. (S)
10. The lady that I employed last month works hard. (O)
11. The lady that I gave a gift to looked happy. (IO)
12. The picture that I am looking at was painted by Junko. (OBL)
13. The man that I am taller than doesn't play basketball. (OCOMP)

(3) Grammatical relative clauses involving a null operator and a null complementiser

14. The house you can see over there was built last year. (S)
15. The man they lent money to bought a big house. (D)
16. The book we got the information from is useful. (OBL)
17. The girl I sing better than has decided to study hard. (OCOMP)

(4) Ungrammatical relative clauses involving *who/whom/which that*

18. *The woman who that is singing my sister. (S)
19. *The mirror which that Hiroshi broke was expensive. (O)
20. *The cats which that I gave the milk to were small. (IO)
21. *The man whom that we talked with was our teacher. (OBL)
22. *The boy whom that I studied harder than passed the exam. (OCOMP)

(5) Ungrammatical relative clauses involving resumptive pronouns

23. *The building that it stands near the river is our hotel. (S)
24. *The man that you don't like him is very unkind. (O)
25. *The girl that I lent the book to her studied hard. (IO)
26. *The town that my uncle came from it is far from here. (OBL)
27. *The trees that you are shorter than them are falling down. (OCOMP)

(6) Grammatical *Wh*-questions

28. Who came to see you last night?
29. What did Hiroshi decide to do for his son?
30. What did Junko want to talk about?
31. Whose shoes are you going to borrow today?

32. When did Junko go to Paris to study French?
33. Why was Junko surprised to receive the letter from me?
34. Who(m) does the woman know that Junko loved?
35. What language is it necessary for Hiroshi to learn?

(7) Ungrammatical *Wh*-questions without subject-auxiliary inversion

36. *Who your favorite baseball player is?
37. *What Junko and Hiroshi wanted to do?
38. *What Hiroshi complained about?
39. *Whose house Hiroshi is going to build?
40. *Why Junko was worried about her son?
41. *Where Junko got such a great idea?
42. *Which prize it was possible for Junko to win?
43. *Which country you believe that Japan attacked?

(8) *Wh*-movement out of a relative clause

44. *This is the lady who(m) Junko wrote the book which describes. (O)
45. *This is the car which the police caught the man who stole. (O)
46. *What did Junko interview the man who criticized? (O)
47. *What did Hiroshi visit a restaurant which served? (O)

(9) *Wh*-movement out of a sentential subject (subject island)

48. To discover that Hiroshi has cancer was no surprise to her.
49. That Hiroshi goes to college is a heavy burden for his parents.
50. *This is the ghost which a picture of frightened the children. (OBL)
51. *This is the meeting which for Hiroshi to attend shocked her. (O)
52. *What did a serious discussion of occur during the meeting? (OBL)
53. *Who(m) did that Junko went out with make Hiroshi angry? (OBL)

(10) *Wh*-movement out of an adjunct island

54. Many houses were damaged by the storm while I visited Niigata.
55. You have to be prepared for the exam before watching TV.
56. *This is the homework which Junko went to school without doing. (O)

57. *This is the girl who(m) the bell rang while I was thinking of. (OBL)
58. *Which car did Junko cross the street when Hiroshi stopped? (O)
59. *Who(m) did an earthquake occur while you were talking with? (OBL)

(11) *Wh*-movement out of an embedded question (*wh*-island)

60. Junko watched how Tomoko made sandwiches.
61. Hiroshi asked me who had caused the car accident.
62. *This is the girl who(m) Hiroshi told me when he visited. (O)
63. *This is the CD which Hiroshi knows where I bought. (O)
64. *Which car did Hiroshi ask Junko when he bought? (O)
65. *What did Junko wonder who would believe? (O)

(12) *Wh*-movement out of a complex NP

66. Junko questioned the decision that we should sell the car.
67. Hiroshi heard the news that Junko would get married.
68. *This is the house which we heard the news that Junko bought. (O)
69. *This is the boy who(m) Junko described the way that Hiroshi hit. (O)
70. *Which car did Junko believe the claim that Hiroshi stole? (O)
71. *Who(m) did Junko know the fact that Hiroshi liked? (O)