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Wei-Shen Tao

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**A CRITIQUE OF RESEARCH ON THE CRITICAL PERIOD
IN SECOND LANGUAGE ACQUISITION**

By

Wei-Shen Tao

A THESIS

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ABSTRACT

A CRITIQUE OF RESEARCH ON THE CRITICAL PERIOD IN SECOND LANGUAGE ACQUISITION

By

Wei-Shen Tao

Within the framework of Chomsky's linguistic theory, the underlying assumption of language acquisition is that a child will not be able to attain the linguistic competence of the adult from the input data alone. Because of this 'projection problem' in child language acquisition, the hypothesis of innate Universal Grammar has been proposed to account for how linguistic knowledge is acquired by the child. Furthermore, the hypothesis of a Critical Period for language acquisition has been proposed to account for the observed inadequacies of second language acquisition after about age 12.

In this thesis, we argue that two influential research studies on second language acquisition which support the hypotheses, Schachter (1990) and Johnson & Newport (1991), are inadequate to rule out the role of universal grammar in second language acquisition. We discuss some crucial problems regarding the subjects, test sentences, and data analyses in both studies, and accordingly argue that both studies are problematic for their claim of the inaccessibility of Universal Grammar in second language acquisition.

**Dedicated to
my father Shu-Hsiang Tao (陶樹香)**

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INTRODUCTION

Within the framework of Chomsky's linguistic theory, the underlying assumption of language acquisition is that a child will not be able to attain the linguistic competence of the adult from the input data alone. Because of this 'projection problem' in child language acquisition, the innate Universal Grammar (UG) is then taken to account for how linguistic knowledge is acquired by the child. In this paper, we argue that some research data on second language acquisition are inadequate to rule out the role of UG. Our criticism will mainly focus on two noticeable studies, Schachter (1990) and Johnson & Newport (1991). We argue that both studies are problematic for their claim of UG's inaccessibility in SLA.

It is important to mention that we do not intend to address directly what the role of UG is in Second Language Acquisition although arguments of both sides are reviewed in this paper. Before we discuss these two articles, we first briefly review some relevant theories and arguments about the age effects on language acquisition.

Background

Recent studies in child language already argue that a child cannot acquire certain complex properties of language only on the basis of input data; therefore, properties of UG must be built in. During the past decades, one of the essential problems that linguists argue most is the question of whether or not second language acquisition (SLA) is also guided and controlled by UG (e.g., Birdsong 1992, Bley-Vroman 1989, Coppieters 1987, Eubank 1991, Flynn 1993, Flynn and Manuel 1991, Long 1990, Martohardjono and Gair

1993, Newport 1990, and White 1989). The controversial discussion in SLA focuses on the following question: do L1 and L2 learners share the same learning module to acquire linguistic knowledge of the target language? To address this question, research refers to the issue of Lenneberg's critical period hypothesis.

Lenneberg (1967) proposes that there exists a critical period, between age 2 and puberty, for primary language acquisition. His hypothesis is that this critical period corresponds with the establishment of cerebral lateralization. He cites surveys of the relevant clinical study and then provides support for the critical period and equipotentiality hypothesis from evidence of the effects of early cerebral damage on language acquisition. He claims that only children can transfer language functions completely to the right hemisphere after an operation for an injured left hemisphere. He concludes that interhemispheric reorganization of language functions is possible only before puberty, and he links relevant time limitations for language learning to the lack of plasticity of the human brain. According to Lenneberg's proposal, first language learning turns out to be impossible after puberty. However, Lenneberg's theory has been challenged by later research. For example, Krashen (1973) reanalyzes the data cited by Lenneberg and finds that the timetable for language acquisition proposed by Lenneberg is irrelevant. Krashen argues that lateralization must be completed by around age 5 rather than up to puberty.

Taking a similar line, many researchers in SLA propose a weak version of Lenneberg's critical period hypothesis, namely a sensitive period hypothesis (e.g., Johnson 1992a, Johnson and Newport 1989 & 1991, Oyama 1982, and Patkowski 1980 etc). According to this hypothesis, changes in sensitivity for language acquisition show gradual increases and declines, instead of an absolute and abrupt onset and offset. Generally

speaking, for phonology, the acquisition of native-like pronunciation is complete at age six; and for morphology and syntax, the age limit for native-like attainment is before 15. If a learner's age of acquisition is before this timetable, he/she will be able to attain native-like L2 competence. According to the notion of the sensitive period hypothesis, language learning is still possible after the above age limits. However, the capacity for language learning declines with age due to the maturational constraints, so older learners' native-like attainment is not guaranteed.

Results of above studies indicate no correlation between age of acquisition and ultimate attainment of L2 acquisition. Most researchers support the likelihood that younger learners are better learners. Accordingly, researchers of this party argue that first language acquisition and second language acquisition may be dominated by different learning modules. Younger learners, who are still within the critical (or sensitive) period, are dominated by the same learning module as for their L1 acquisition, namely UG. That is the reason why success of younger learners' L2 acquisition is guaranteed. However, older learners' L2 acquisition turns out generally to be a failure, for the innate learning faculty UG is no longer or not completely available for their L2 acquisition. Therefore, it is assumed that older L2 learners apply some other learning modules, like general problem-solving, which cannot fully replace the functions of UG.

However, researchers of another party propose that UG still plays an important role in second language acquisition (e.g., Felix 1985 and 1988; and White 1992a, 1990, and 1988). These studies on L2 learners' interlanguage argue that learners' immature language performance of L2 also reveals sophisticated and complex linguistic properties. So these features of L2 learners' interlanguage also cannot be induced directly from the

L1 knowledge or the input data. These researchers claim that there is also a mismatch between the input data and L2 learners' ultimate attainment. As White (1989: 38) points out, "we potentially have the same projection problem as in L1 acquisition, namely that knowledge is attained which goes beyond the input and which could not be acquired on the basis of general learning strategies or problem-solving." As motivated for L1 acquisition, principles of UG must also mediate L2 acquisition because an L2 learner shares the similar logical problem of language acquisition as L1 learners.

In order to examine whether or not UG is still available in SLA, recent L2 research has examined some properties of UG, such as the principle of Subjacency, the Empty Category Principle (ECP), or the Projection Principle, as evidenced by the L2 learner. One of the crucial independent variables in these studies is "age of acquisition". Researchers usually compare the performance of different age groups or simply study the older learners' L2 acquisition. The hypothesis is that older subjects' worse performance, compared with the native speakers and younger learners, indicates the absence of UG (e.g., Long 1990, Newport 1990, Johnson and Newport 1989 & 1991, and Schachter 1989 & 1990).

Their general findings show that there are age-related effects on second language proficiency. The younger learners usually outperform the older ones in the long run, and this phenomenon seems to support the notion of a sensitive period for L2 acquisition. Nevertheless, we will argue that two important studies' claims against availability of UG in SLA are problematic due to the failure of their methodology: Schachter 1990 and Johnson & Newport 1991. Before any discussion on this topic, we briefly review three theoretical aspects generally applied in the study on second language acquisition: the

general notion of Universal Grammar, the measure of L2 competence, and the Subjacency Principle.

Universal grammar and language acquisition

Chomsky proposed the theory of Universal Grammar (UG) to account for how a child can possibly achieve the linguistic knowledge possessed by adults. A theory of grammars, UG is composed of the abstract principles which are believed to generally underlie all human languages. As Chomsky (1975: 29) argues, UG provides “a system of principles, conditions, and rules that are elements or properties of all human languages, not merely by accident, but by necessity”. Further, he proposes that these essential linguistic properties of UG are purely innate.

Researchers in child L1 acquisition support Chomsky’s hypothesis that some linguistic principles have to be built in. The principles and parameters of UG theory provide a significant basis for a child’s L1 acquisition. One main fundamental issue that researchers argue most is the so-called “projection (or logical) problem” in language acquisition. That is, children cannot possibly obtain the linguistic knowledge of adults solely based on the input which they are exposed to. White (1989) provides a detailed discussion about three main projection (or input) problems.

According to White’s argument, the first problem is underdetermination, which is “by far the most serious one, providing the best motivation for innate, specifically linguistic structure” (p. 5). She mainly argues that there is not a corresponding pattern between the environmental input and the linguistic knowledge actually attained. Instead, the grammar of the target language is far beyond the available input. Therefore, in order

to account for how a child can arrive at the adults' linguistic competence even though there is no available input to trigger the overt principles of the target language, the innate linguistic faculty "UG" must be involved.

The second problem is concerned with the degeneracy of input to a learner. The language that a child hears may be ungrammatical or fragmentary sometimes. Logically speaking, a child should have problems to come up with the correct grammar when confronting both grammatical input and ungrammatical (or incomplete) input. Without knowledge of UG, the child will possibly generalize either correct or incorrect rules, and he/she has insufficient basis for knowing which is which. Therefore, it must be innate knowledge "UG" that guides the child to generalize the grammar of the target language, despite the degenerate input. A child will know in advance that certain kinds of hypotheses are impossible because of UG constraints.

The third problem is so-called "negative evidence". When a child learns a language, he/she may not get the negative input or make the relevant sorts of errors to learn what are ungrammatical and impossible sentences in the target language. In other words, a child may not have a chance to experience certain sorts of ungrammatical sentences, or if experiencing them, to find out they are ungrammatical. However, with the innate linguistic knowledge UG, he/she still attains the ultimate linguistic competence which enables him/her to tell what sentences are possible and impossible in the target language.

Theoretically speaking, UG contains a finite set of principles and parameters which underlie possible grammars for a natural language. Because these properties of UG are innately programmed, language acquisition can be achieved despite the fact that there

exists a projection (or logical) problem. Guided by the constraints of UG, a child can come up with what are possible and impossible grammars in the target language ultimately. Following UG theory as an account of L1 acquisition, researchers on L2 acquisition then consider whether or not this innate linguistic faculty still functions. In the latter discussion section of this paper, I will argue that UG must also be available to second language learners.

Measure of L2 competence: grammaticality judgment tasks

In order to investigate whether or not non-primary language (L2) acquisition is also constrained by the principles of UG, researchers apply different methods to tap a learner's linguistic knowledge of L2. The most common technique is the solicitation of grammaticality judgments. A grammaticality judgment task can involve sentences which violate constraints of UG, so that a researcher can determine whether or not the learner observes those constraints. In most of the research, the operation of UG is assumed only if the learner performs accurately in both correct and incorrect test sentences. However, there exist two main problems with this kind of tapping of linguistic competence.

The first problem is that grammaticality judgment tasks may not represent a whole picture of the underlying competence of an L2 learner. Linguistic competence is an abstract notion which cannot necessarily be measured directly by any task. Grammaticality judgment tasks may more likely test a learner's L2 performance than competence. If a study involves a measure of subjects' performance, a researcher may need to take into consideration some variables related to testing behavior. These variables are crucial to the results of a study. For example, as White (1989: 59) points out, the subjects may "show a

tendency to accept all sentences, regardless of their grammaticality”. Or, the subjects will reject long sentences because of the lack of metalinguistic skills or the parsing difficulty. They may guess if they are not sure, instead of trying hard to access available knowledge. They may lose patience if the test is too long, or they may expect that there is a balance between tested sentences. Studies involving grammaticality judgment tasks should consider such relevant variables.

The other problem is whether or not the study has validity. If some variables are not controlled, the results of a study may reflect a false issue as in Schachter’s or Johnson & Newport’s articles discussed later. Most recent studies in second language acquisition are cross-sectional. Within the framework of this kind of study, one variable in particular should be controlled: subjects’ L2 proficiency level. When a researcher claims to test certain properties of UG, he/she has to make sure that subjects have already reached the appropriate acquisition level to recognize those tested properties of UG in an L2.

In other words, if a learner’s L2 acquisition is still one step behind some principle, a research cannot claim that this principle of UG does not operate when the subjects’ judgments show violation of the principle. To avoid this probability, researchers usually set up control sentences which are less advanced but structurally similar to the ungrammatical ones (e.g., Bley-Vroman et al. 1988, Johnson & Newport 1991, and White 1988a). Before the test, a researcher first has to make sure that the subjects have no problems with the control sentences; otherwise, the results of the study are then not significant simply because the researcher has not tested what he/she claims to test. Accordingly, research containing this problem is unable to argue whether or not UG is in operation in L2 acquisition.

The grammaticality judgment task ideally is a satisfactory method to investigate a learner's L2 knowledge. However, if the above two discussed problems exist, it still possibly fails to truly measure a learner's L2 knowledge and to provide evidence as to claim whether or not UG is still active. My later critique on Schachter's and Johnson & Newport's articles will show that the results of their studies are derived from questionable grammaticality judgment tasks in some such respects. Therefore, I argue that their claims against UG's role in SLA are not significant. Because both studies test Subjacency in English wh-movement, a brief introduction to the Subjacency Principle is given below.

The Subjacency Principle

In order to investigate whether or not UG is active in L2 acquisition, researchers employ different properties of UG to test the learner's L2 knowledge. One of the principles applied in a number of L2 acquisition research is the Subjacency Principle (e.g., Bley-Vroman et al. 1988, Johnson & Newport 1991, Schachter 1989 & 1990, and White 1988). According to Haegeman (1991: 365), Subjacency stipulates that "movement cannot cross more than one bounding node, where bounding nodes are IP and NP". The presentation below focuses on Subjacency in English wh-movement, for most studies deal with English L2 acquisition.

Generally speaking, there may be either a short or a long movement for wh-elements in English. The distance is not subject to grammaticality. For example, both (1), which involves a short movement, and (2), which involves a long movement, are grammatical.

- (1) Whom did the instructor give the credits?

(2) Whom did you believe that the instructor gave the credits?

In Sentence (1), *whom* is moved within the main clause and crosses only one IP; therefore the movement is grammatical. However, in sentence (2), *whom* is moved from a lower clause to a higher clause and seems to cross two IPs in question. The linguistic assumption is that [Spec, CP] is the landing site of wh-movement. When a long wh-movement occurs, there should be one or more intermediate [Spec, CP] positions available for a wh-trace's landing. Otherwise, the movement is ungrammatical because of crossing two bounding nodes at a time. Accordingly, sentence (2) can be represented as sentence (2)a.

(2)a [CP Whomi did [IP you believe [CP t'i that [IP the instructor gave ti the credits]]]]?

In sentence (2)a *whom* is first moved to [Spec, CP] of the embedded clause and then to the [Spec, CP] of the main clause. Both movements cross only one IP and thus are grammatical. Sentence (3) is an example of a Subjacency violation.

(3) *[CP Whomi did [IP you believe [CP whenj [IP the instructor gave ti the credits tj]]]]?

In sentence (3) there are two wh-elements. At first, the adjunct *when* has to be moved to [Spec, CP] of the embedded clause to avoid the violation of the cyclic condition, and this movement is okay. Because the intermediate landing site is already occupied by *when*, *whom* then has to move to [Spec, CP] of the main clause directly and crosses two IPs at a time. This step violates Subjacency and therefore this sentence is ungrammatical. In a similar manner, sentence (4) shows a Subjacency violation according to which the

intermediate t'i crosses two bounding nodes, IP and NP, at a time. Thus, the sentence is ungrammatical.

- (4) *[CP Whomi did [IP the instructor make [NP the claim [CP t'i
that [IP he gave ti the credits]]]]]?]

In SLA, some research investigates the availability of Subjacency by studying the acquisition of English by subjects with different L1 backgrounds. The hypothesis is that the Subjacency Principle does not operate in the subjects' L1 and so UG must play an active role if the subjects observe the Subjacency violations in English.

In order to evaluate L2 learners' performance on the Subjacency Principle, a researcher needs to make sure that his/her subjects are highly advanced L2 learners. As the examples that we gave above suggest, Subjacency only occurs when a wh-element moves across those complex sentence structures with at least one or more embedded structures within. Because of the complex sentence structures involved, we therefore suggest that the research on Subjacency requires L2 learners at a relatively advanced proficiency level, subjects who may reasonably be supposed to have little or no difficulty with aspects of language which make up the Subjacency phenomenon.

PURPOSE OF THIS THESIS

The purpose of this thesis is to propose that arguments of some extant research results, which rule out the role of UG by studying the Subjacency Principle, are questionable. We will review and criticize two important articles, Schachter 1990 and Johnson and Newport 1991, which examine the L2 acquisition of Subjacency in English. Our critique will focus on theories of UG and research methods applied in these two studies. In the third section of this paper, we will first give a summary of Schachter 1990 and then discuss the problems found in the study. In the fourth section, we will discuss Johnson & Newport 1991 in a similar manner. Then, in the discussion section, we will first discuss the similarity of the crucial problems found in these two studies and claim that both research data of these studies are inadequate to rule out the role of UG in SLA. At last, we raise an issue that no current theory fully demonstrates the phenomena in second language acquisition at present, and we are looking forward to a better understanding when the debates between UG and not-UG move on.

SCHACHTER (1990)

Schachter's study investigates whether or not L2 learners acquire the principles of Subjacency and ECP in English. She proposes that L2 learners show little or no evidence of observing Subjacency in English if their L1 does not include the similar syntactic phenomena. According to her results, she claims that "this experiment provides strong evidence that the Incompleteness Hypothesis is the correct hypothesis for adult L2 acquisition as well, and therefore that completeness in second language acquisition past puberty is likely to be an impossibility" (p. 118). However, there are some potential problems, which are either theoretical or methodological ones, revealed in Schachter's study. Consequently, her claim about UG's inaccessibility is questionable.

A brief summary of Schachter's study

Schachter studies the acquisition of Subjacency in English by four L2 groups with different L1s: Dutch, Indonesian, Chinese, and Korean. The linguistic assumption is that a language with overt wh-movement phenomena must observe constraints of the Subjacency Principle; on the contrary, these constraints do not apply if there is no wh-movement. The above four languages are related to different aspects of Subjacency. Schachter says that Dutch exhibits the full range of Subjacency's constraints as observed in English. Both Indonesian and Chinese partially show evidence of Subjacency. As she points out, wh-movement in Indonesian is allowed only if the wh-word is "promoted to subject in its own clause before being moved to the beginning of the sentence" (p. 102). As for the Chinese language, instead of overt wh-movement, the wh-word remains *in situ*. However, Chinese

allows other kinds of movements, like relative pronoun or topic extraction, which also involves Subjacency. Different from the other four languages, Korean does not allow any kind of extraction at the level of S-structure; therefore it does not show properties of Subjacency.

Schachter's experiment is designed to test knowledge of long-distance wh-movement, knowledge of impossible wh-movement, and knowledge of Subjacency violations in English. The research hypotheses are quoted from Schachter's study as follows:

- H1. knowledge of grammatical wh-movement will have an effect on knowledge of Subjacency violations involving wh-movement.
- H2. knowledge of the grammatical constructions that constitute islands will have an effect on knowledge of Subjacency violations involving extraction out of them.
- H3. there will be a language-specific effect on knowledge of Subjacency.

For the Korean subjects the period of L1 development of Subjacency will have passed before the subjects began their exposure to English and as a result they will have no latent knowledge of Subjacency to fall back on. The Dutch subjects, on the other hand, will have complete knowledge of Subjacency effects, as a result of their exposure to their L1 during the appropriate maturational stages.

(p. 105)

Schachter employs a set of sentences for written grammaticality judgments to examine subjects' knowledge of Subjacency in English. Subjects are asked to judge

whether a sentence is clearly grammatical, probably grammatical, probably not grammatical, or not grammatical. The test takes approximately 30 minutes. There are 66 test sentences in all, and all sentences are randomized. The test sentences include four types of English construction: sentential subjects (SS), noun complements (NC), relative clauses (RC), and embedded questions (EQ). There are a total of nine subtests for testing the Subjacency Principle in this study. Five subtests constitute the control sentences (or the syntax test): the wh-movement subtest, the SS subtest, the NC subtest, the RC subtest, and the EQ subtest. The other four subtests are Subjacency violations: the *SS subtest, the *NC subtest, the *RC subtest, and the *EQ subtest. Here are example sentences of above tests which we copy from Schachter's study:

1. the wh-movement:

What does the professor expect us to know for the exam?

2. SS:

That oil prices will rise again this year is nearly certain.

3. NC:

The judge rejected the evidence that the student committed the crime.

4. RC:

The theory we discussed yesterday will be on the exam next week.

5. EQ:

The dorm manager asked me who I wanted to have as a roommate.

6. *SS:

*Which party did for Sam to join shock his parents?

7. *NC:

***What they have to accept the idea that they couldn't operate by themselves?**

8. *RC:

***What did Susan visit the store that had in stock?**

9. *EQ:

***Who did the Senator ask the President where he would send?**

Experimental subjects are 18 Dutch, 21 Indonesian, 20 Chinese, 20 Korean subjects, and all had begun the process of English learning at age 12 or later. All are undergraduate students and "highly proficient speakers of English" (p. 108). None of the subjects had been exposed to the linguistic study of Subjacency. The controls are 19 native speakers. Schachter says that the backgrounds of all experimental subjects are homogeneous and that neither age at first exposure nor residence in an English-speaking country has an effect on subjects' performance.

Subjects' overall performance shows that all groups did well in judging grammatical sentences; however, the performance differs in ungrammatical sentences. We copy the results of her study (p. 111) as displayed in Table 1 below. The mean numbers are the means of test sentences answered correctly.

Table 1 Means and Standard deviations of correct answer

Group	Total Grammatical (24 sentences)		Total Ungrammatical (24 sentences)		Wh-movement (9 sentences)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Native	21.6	2.7	21.2	1.9	7.1	1.07
Dutch	22.2	1.9	21.9	2.8	7.6	.98
Indonesian	21.2	2.6	15.2	4.5	5.26	1.2
Chinese	21.2	2.2	17.2	3.7	5.0	1.4
Korean	19.8	3.8	12.4	4.5	5.6	1.0

As shown, there is no significant difference among the means of 24 grammatical sentences. But, only the native (21.2) and Dutch (21.9) subjects performed well in the 24 ungrammatical sentences. The Indonesian (15.2), Chinese (17.2), and Korean (12.4) groups performed significantly worse than Dutch subjects and the native group. Moreover, the Korean subjects did worst among the experimental groups. According to the results, Schachter claims that “native language has a significant effect on knowledge of one principle of Universal Grammar in post-puberty-acquired second language grammars” (p. 116).

Dutch subjects have already acquired the Subjacency effects, which are similar to the ones in English, in their L1 acquisition; therefore they can precisely identify a Subjacency violation. Indonesian and Chinese subjects only observed part of Subjacency effects in their L1 acquisition; therefore they may only identify some sorts of Subjacency violations in English. That is, their knowledge of English Subjacency is incomplete and thus they perform worse than Dutch subjects. Korean subjects did not acquire the notion of Subjacency in their L1 acquisition; so their acquisition of English shows no constraint of Subjacency.

Schachter further argues that the results of her study clearly rule out the role of UG and support the Incompleteness Hypothesis in L2 acquisition. As she questions, if UG is still available in L2 acquisition, Indonesian, Chinese, and Korean subjects will “be able to detect Subjacency violations in English just as well as the Dutch subjects” (p. 118). She proposes that UG is not reactivated in adult L2 acquisition. Moreover, she claims that completeness in second language acquisition past puberty can hardly be achieved.

However, findings of Schachter's study may be questionable due to problems of her subject selection and the test sentences.

Problems in Schachter's study

There are three crucial problems in this study. The first problem concerns the issue of subjects. Differences in the "incomplete" performance of the experimental subject groups may be due to subjects' insufficient L2 knowledge rather than due to their different L1 backgrounds, therefore results of Schachter's study may be superficial. One may argue that the subjects, except the Dutch group, have not acquired Subjacency in English yet.

The second problem concerns the issue of the test sentences. Although including a syntax test, the test does not include corresponding grammatical wh-movement sentences as the control sentences. The wh-movement tests consist only of nine grammatical sentences which involve different wh-movement: 3 with one-clause movement, 3 with two-clause movement, and 3 with three-clause movement. Either a wh-subject or wh-object is moved in each group. Examples of the wh-movement test are copied from Schachter's study as in the following:

(1) What does the professor expect us to know for the exam?

(wh = object in S2)

(2) Who did the president say he planned to appoint as ambassador?

(wh = object in S3)

(3) Who do you think Bill said Mary expected to go to the dance with Mark?

(wh = subject in S4)

Schachter's wh-movement test does not include the corresponding sentence structures that she includes in her Subjacency test. We argue that Schachter should have included grammatical wh-questions parallel to those ungrammatical sentences on Subjacency tests. For example,

(4) What did they know that Sarah disliked?

(5) *What did they know the fact that Sarah disliked?

Here both (4) and (5) involve a wh-movement in an NP-complement structure, but only (5) is not grammatical because of violation of Subjacency. Without corresponding patterns, we simply don't know whether or not her subjects have already acquired wh-movement in English. Further discussion of this issue will be given below.

The third problem is that Schachter's theoretical conclusion seems to conflict with the views derived either from the sensitive period hypothesis or from the availability of UG. Schachter said that her subjects "had all begun the process of acquisition of English between age 12 or later" (p. 108). That is, their age of acquisition is obviously around puberty and still within the timetable within which most researchers believe that native-like competence of L2 acquisition is still highly attainable. Hence, Schachter's Incompleteness Hypothesis seems more likely to argue that acquisition of any non-primary language is absolutely impossible; however, her hypothesis does not provide any significant evidence to account for any possible age effect on UG's accessibility. Explicit discussions of the above three problems are given below.

Subjects in Schachter's study

The subjects' English proficiency may not be sufficient. Schachter's assumption about her subjects' English proficiency may be questionable. Schachter says that her subjects, not including the 18 Dutch, "had either a) taken the USC English placement exam and been exempted from any ESL requirement or b) in fact had been required to take an ESL course but had completed all such requirements in a semester before the one in which the Subjacency tests were administered" (p. 108). Schachter assumes on this basis that all her subjects are "highly proficient speakers of English". She does not apply any other criterion to measure subjects' accurate English proficiency level. Besides, Schachter's syntax test fails to confirm the L2 subjects' qualification to some extent regarding Subjacency in English, and we will discuss this problem later. Accordingly, we simply don't know whether her subjects are qualified to be selected in her study or not.

Another minor issue is that the foreign freshmen may not be the ideal subject pool. Schachter's subjects were students in sections of an introductory linguistics course or Freshman English courses. We suspect that all these "foreign" freshmen still have problems to perform as highly proficient speakers of English. Foreign undergraduate students in many universities probably only need to pass the language test required by their university, a test requirement is probably equivalent to 550 or less (see Custard 1998) on the TOEFL. With this level of English proficiency, Schachter's subjects do not convincingly represent a highly proficient subject pool.

Besides, previous studies (e.g. Johnson & Newport 1989) "have shown no effects of length of experience with the language for adult learners of a second language after 5 years of immersion in the target language" (Johnson & Newport 1991, p. 228). All

means of the 3 Asian groups' length of residence to English are much less than 5 years. The Indonesian and Korean groups' length of residence are even less than 3 years. As shown in Table 1 (p. 109), the mean of the Chinese subjects' months in English speaking countries is 48.5; of the Indonesians' 27.6 months; and of Korean subjects' 34.2 months. If length of experience also plays a role in the second language acquisition, one may therefore question that Schachter's subjects' acquisition of English is still in the immature stage.

Because of these problems, we believe that Schachter's Asian subjects are not highly advanced English learners and might for this reason alone have failed to perform on the Subjacency tests. As for the 18 Dutch subjects, one possibility is that they may actually be the only highly proficient group. They even outperform the native speakers as the control group. The other possibility is that they may follow a pattern of answering the test sentences as discussed in the following section.

Test sentences in Schachter's study

The second problem concerns the issue of the test sentences. Although Schachter does include equal numbers of 24 grammatical sentences and 24 ungrammatical sentences in her test, the test does not include corresponding grammatical wh-movement sentences as the control sentences. All of her 24 grammatical Subjacency sentences are declaratives. As we mentioned before, although Schachter's test does include a subtest including 9 grammatical wh-movement sentences, the sentence structures of these 9 questions are not similar to those questions of the Subjacency test.

Schachter's wh-movement test only deal with the aspects of wh-words' moving across one clause, two clauses, or three clauses. But, most importantly, she should apply wh-movement test sentences parallel to questions in the Subjacency test. When testing Subjacency in English, a researcher first needs to make sure that L2 subjects have already acquired wh-question movement in general. To clarify this, correct wh-questions should be provided in a grammaticality judgment test. Furthermore, these grammatical wh-questions should be structurally parallel to those ungrammatical questions which are for the Subjacency test. Otherwise, the structural difference may become another factor in subjects' judgments. Let's look at the examples below.

- (1) What did they know that Sarah disliked?
- (2) *What did they know the fact that Sarah disliked?

Here both sentence (1) and sentence (2) involve a wh-movement in an NP-complement structure, but only (2) is not grammatical because of violation of Subjacency. We will have several possible answers judged by an L2 English learner for these two wh-questions. If the learner judges either that (1) is ungrammatical and (2) is grammatical or that both (1) and (2) are not grammatical, we will say that this subject has not acquired wh-movement in English—more specifically, a wh-movement in an NP-complement structure. This subject then is not a qualified candidate for the study on Subjacency.

As we suggest, before testing Subjacency, we first need to make sure whether a subject knows wh-movement structures in English. That is, a correct answer on (1) from the subject must be guaranteed. There are two possibilities. One is that, judging that (1) is grammatical and (2) is also grammatical, the learner knows the structure of wh-movement extracted from an NP-complement but does not identify the Subjacency

violation in (2). The other is that, judging that (1) is grammatical and (2) is not grammatical, the learner knows the structure of wh-movement extracted from an NP-complement and also identify the Subjacency violation in (2). We then say that this subject performs as well as the English native speaker regarding Subjacency. Schachter's 24 declaratives grammatical sentences obviously do not bear the function of question (1) given above, and fail to investigate whether her subjects have acquired English wh-movement. Accordingly, we question that her subjects are indeed qualified candidates for a study on Subjacency.

Johnson & Newport (1991) point out that Schachter's test sentences cannot provide clear evidence showing that a subject does observe Subjacency. They mention that, without including corresponding grammatical wh-movement sentences, Schachter's test fails to clarify the possibility that "rejection of these sentences could have happened if subjects believed that question formation in any form is ungrammatical, or more reasonably, that question formation in any complex sentences is ungrammatical" (p. 223).

Johnson & Newport also mention that Schachter's test "was not designed to rule out a simple response bias" (p. 223), namely subjects saying "yes" or "no" to all test sentences. But, as we can see from Table 2 (p. 111), this is not the case. Even the means of Korean subjects do not show this bias. However, it's possible that a similar response bias may be observed by some subjects. They may assume that they only need to say "yes" to all declaratives and "no" to the questions as in the examples given below:

- a. Question (say no): *Which party did for Sam to join shock his parents?
- b. Declarative (say yes): That oil prices will rise again this year is nearly certain.

We believe that this is the case for the Dutch subjects, and that may be the reason why the Dutch group performs even better than the native control group in both grammatical sentences and ungrammatical ones.

In addition to the above two problems, there is another problem which can be referred to as either a problem of the test sentences or of subject selection. Schachter includes 9 wh-movement sentences in the test and we show the test results in Table 2 (as her Table 2 on p. 111).

Table 2 Means and Standard deviations of correct answer on 9 wh-movement sentences

Group	Wh-movement (9 sentences)	
	Mean	S.D.
Native	7.1	1.07
Dutch	7.6	.98
Indonesian	5.26	1.2
Chinese	5.0	1.4
Korean	5.6	1.0

On the one hand, one may argue that these wh-movement sentences are not well designed. The mean number of the native control group is only 7.1 (out of 9) which is below 80% and well below the standard, 90% as in most research. One may therefore suspect that the results of this study are questionable, for the test sentences are problematic.

On the other hand, if we ignore the problem of the ill-designed wh-sentences and agree with Schachter, then the subject issue raises again as we discussed in the above section. Subjects are supposed to answer these questions without any problem if they know the wh-movement sentence structures in English. However, as we can see, it is not the case and all three Asian subject groups answer the questions correctly only just above chance level. The mean of Indonesian group is 5.26 (out of 9), of the Chinese group 5.0, and of the Korean group 5.6. If there is nothing wrong with the test sentences themselves,

the means of the Asian groups should be close to the means of the Dutch group (7.6) and the native control group (7.1). According to the means of the Asian groups, we argue that these subjects have not completed the acquisition of the wh-movement sentence structure in English yet, and therefore these subjects are not qualified for Schachter's study on Subjacency. Due to the problems we discuss above, we claim that Schachter's test sentences fail to examine what she planned to examine.

Schachter's theoretical conclusion: the Incompleteness Hypothesis

Schachter's theoretical conclusion seems to conflict with the views derived either from the sensitive period hypothesis or from the availability of UG. All Schachter's subjects had begun the study of English between age 12 and 15. Their age of acquisition is still within the time in which most researchers believe that native-like competence of L2 acquisition is still attainable. In this section, we will first review Schachter's Incompleteness Hypothesis, and then we will argue that her hypothesis does not provide significant evidence to account for possible age effects on UG accessibility.

What does Schachter's Incompleteness Hypothesis tell us?

Schachter's Incompleteness Hypothesis is that completeness with regard to L2 acquisition will not be possible due to the inavailability of UG as a knowledge source. To support this argument, she gives a proposal and we quote her own words as below.

If, however, it turns out that in the acquisition of the target some instantiation of principle P is necessary and P is not incorporated into the learner's L1, the learner will have neither language-internal knowledge nor initial-state knowledge to guide

one in the development of P. Therefore, completeness with regard to the acquisition of the target language will not be possible. (p. 100)

Generally speaking, her idea is that some principles of UG (e.g. Subjacency) will remain disabled at all times if they are not activated in one's L1 acquisition. That is, an L2 learner will subsequently only have access to the principles of UG which are instantiated in his/her native language. And, those inactivated principles will not be incorporated into L2 acquisition.

We argue that Schachter's proposal is unreasonable because it rules out the phenomena found in multilingual acquisition. As we all believe, a child will be able to learn two or more languages while growing up even if these languages have different properties of UG. For example, a child of a Korean woman and an American man can/will acquire Korean and English in the same time frame, and we will say that both languages are his/her L1s. We then have no argument against Schachter's proposal because both languages are his/her L1s, and there is nothing to do with L2 acquisition in this case.

Nevertheless, Let's say that another 12-year-old Korean child moves to Michigan and only then starts to learn English. We will say that Korean is the child's L1 and English his/her L2 even though he/she begins to learn English only after knowledge of Korean is well established, and he/she should attain native English competence without doubt. But, according to Schachter's proposal, he/she will not be able to acquire Subjacency in English because his/her L1 Korean does not have Subjacency. We believe that Schachter's proposal is in conflict with the finding of most SLA research (e.g., Johnson and Newport 1989 & 1991, Oyama 1982, and Patkowski 1980 etc).

It seems that Schachter's proposal focuses on the availability of UG in late L2 acquisition. She does not precisely give us her own view on the time frame of the critical/sensitive period for L2 acquisition although she does mention "the maturationally appropriate time" (p. 99). As we discussed in the first section on the issue of the so-called "Critical Period Hypothesis", those who deny the full availability of UG in adult second language acquisition agree with the general conclusion that changes in sensitivity for language acquisition show gradual increases and declines, instead of an absolute and abrupt onset and offset. However, the Incompleteness Hypothesis seems to claim a one-point decline which is absolute and abrupt. The properties of UG can only be triggered by input in one's L1 acquisition, and it seems to be a once-in-a-life-time chance. This hypothesis is not confirmed from the results of most studies.

Is her hypothesis sustained by her own study?

We have criticized the subject issues and the test sentences in Schachter's study and argued that the study itself is questionable, and therefore the results that Schachter uses to support her study are problematic. On the subject issue, we find that differences of the "incomplete" performance of the experimental subject groups may be due to subjects' insufficient L2 knowledge rather than due to their different L1 backgrounds. Except for the Dutch group, we believe that all three Asian groups have not acquired Subjacency in English yet. In other words, Schachter fails to target the desired subject pool for her study, and her subjects are not advanced English learners as claimed.

Moreover, because the test does not include corresponding grammatical wh-movement sentences as control sentences, results of Schachter's study may be superficial.

The test sentences fail to reveal whether her subjects have acquired wh-movement in English, let alone Subjacency. Some subjects may not be familiar with the wh-sentence structure in general. As I said in the last section, Schachter's Incompleteness Hypothesis seems more likely to indicate that acquisition of any non-primary language is absolutely impossible. Her study does not have any convincing evidence to support her hypothesis and therefore fails to account for any possible age effect on UG accessibility.

JOHNSON AND NEWPORT (1991)

Johnson and Newport (1991) also examined the L2 acquisition of Subjacency in English. The experimental groups are Chinese speakers, whose L1 does not include the principles of Subjacency according to Johnson and Newport's interpretation. There are two parts of this study. In the first one, they investigated adult learners whose age of acquisition was after the age of 17. According to these results, they concluded that:

This maturational effect was shown not merely to be the result of an inability to set the parameters of this principle. Indeed, the entire integrity of the principle appears to be affected by maturation. (p. 245)

In order to look at the maturational issue in detail, they compared the adult learners' performance in the first part of their study with the performance of three other groups--ages 4-7, ages 8-13, and ages 14-16. The same materials and procedure were used. Based on the results of the second part, Johnson and Newport claim that there is a continuous decline in performance which correlates with age of acquisition (age of arrival in the States): earlier starters perform better.

Compared with Schachter's study, Johnson and Newport's study is much better. Nevertheless, there are still some problems which we would like to raise in this paper, and accordingly we suggest that the results of their study remain ambiguous regarding ruling out the availability of UG in adult second language acquisition. Before discussing those problems, we first give a brief summary of their study in the following section.

A brief summary of Johnson and Newport's study (1991)

Johnson and Newport's study examines whether or not there is a critical period effect for the application of UG to second language acquisition. As in Schachter's study, they also select the principle of Subjacency to be their primary test category. They select Chinese subjects for their study, assuming that "subjects cannot get the correct answers for English Subjacency structures by strict transfer from their native language" (p. 227). That is, if the Chinese subjects observe the Subjacency principle and have no problems with English wh-questions, we have evidence of the operation of UG. On the contrary, if subjects fail to observe Subjacency, we have evidence to question the availability of UG to these L2 subjects. Considering these alternatives, Johnson and Newport conduct two experiments in order to determine any age effects on the acquisition of Subjacency by different age groups.

In the first experiment, there are 23 adult learners, 14 males and 9 females, who were first immersed in English in the U. S. A. "between the ages of 18 and 38, with a mean age of arrival of 25.8" (p. 228). Their average stay in the States before the time of test is 6.2 years, with a range of 5-12 years. At the time of test, subjects are between the ages of 23 and 44. All subjects are selected from graduate student, post-doctoral, and faculty subject pools at University of Illinois; therefore Johnson and Newport claim that all subjects' social background is homogeneous. There are 11 undergraduate native speakers selected as a control group.

Subjects were asked to judge the grammaticality of a series of taped-recorded sentences and say yes/no after hearing them. And, subjects were told to guess if they were unsure. All sentences were read twice, with 1-2-second pause separating the repetitions.

There was again 6-9-second pause between sentences for subjects to make their judgements. There was a break after half of the test, and subjects were told that they could request one anytime if they felt tired or if the tape was too fast for them. After the grammaticality judgement task, there was an interview to gather subjects' background information. Besides, as Johnson and Newport mentioned, "a subset of the subjects, in addition, took a short written comprehension test to test whether or not they were correctly interpreting the questions with subjacency violations" (p. 230).

The tape-recorded test sentences are 180 sentences in all, representing 3 English structures: noun phrase complements (NP-comp), relative clauses (RC) and WH-complements (WH-comp). Johnson and Newport provide 12 sentences as basic sentences representing each of the 3 structures, and each of these basic sentences is presented in four syntactic forms: declarative (grammatical sentences), subjacency violation (ungrammatical sentences), control (grammatical sentences), and no subject-auxiliary inversion (ungrammatical sentences). Here, we copy the examples of the four sentence types for each of the three sentence structures on Johnson and Newport's Table 1 (p. 232).

NP-complements

- (1a) The teacher knew the fact that Janet liked math. (declarative)
- (1b) *What did the teacher know the fact that Janet liked? (subjacency)
- (1c) what did the teacher know that Janet liked? (control)
- (1d) *What the teacher did know that Janet liked? (no inversion)

SS relative clause

- (2a) The policeman who found Cathy should get a reward. (declarative)
- (2b) *Who should the policeman who found get a reward? (subjacency)

(2c) What should the policeman who found Cathy get? (control)

(2d) *What the policeman who found Cathy should get? (no inversion)

Wh-complement structures

(3a) Sally watched how Mrs. Gomez makes her cookies. (declarative)

(3b) *What did Sally watch how Mrs. Gomez makes? (subjacency)

(3c) Who did Sally show how Mrs. Gomez makes her cookies? (control)

(3d) *Who Sally did show how Mrs. Gomez makes her cookies? (no inversion)

There are another 12 simple grammatical wh-questions. Thus, there are 156 ($12 \times 3 \times 4 + 12$) sentences as the core test sentences. In addition, there are 24 filler sentences served to increase the variability but not included in analyses.

Johnson and Newport give the overall results in Figure 1 (their Figure 3, p. 235) which shows the numbers of correct answers over the five sentences types for both the control group and the subject group. As shown on Figure 1 (see p. 33), the Chinese group does worst on the subjacency violations. Based on the results, Johnson and Newport claim that “the subjacency principle is not fully accessible to the mature learner for the learning of a second language” (p. 243). Besides, due to subjects’ better performance for relative clauses structures in comparison to the other sentence types, they also suggest that “language learners show only weak tendencies to observe linguistic universals, and may therefore implicitly form hypotheses about their late-learned language that violate these universals” (p. 245).

Figure 1 Mean number correct on 5 sentence types by native English and Chinese speakers

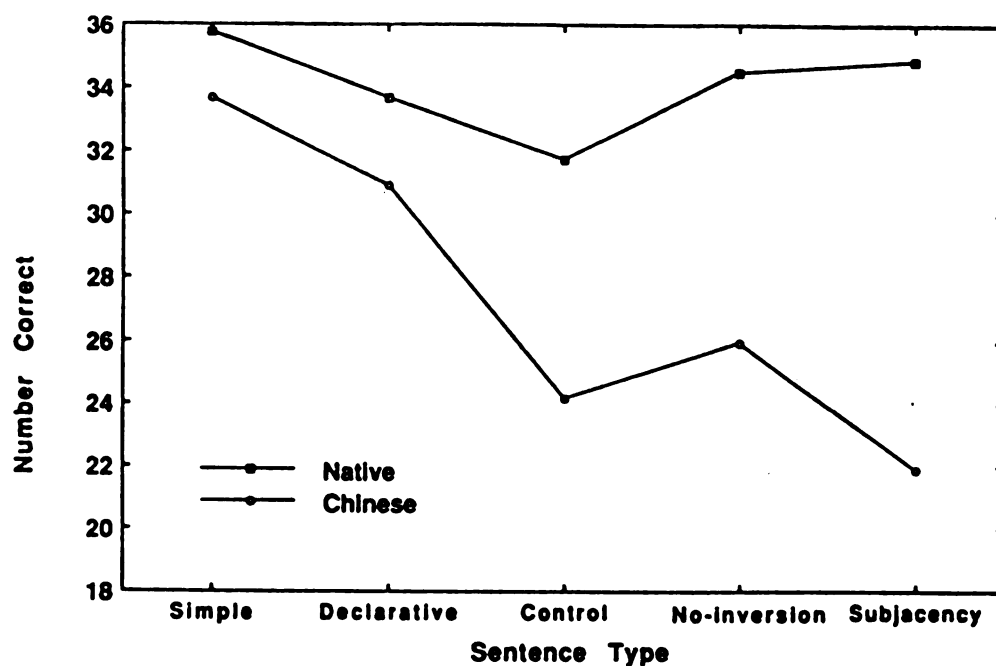
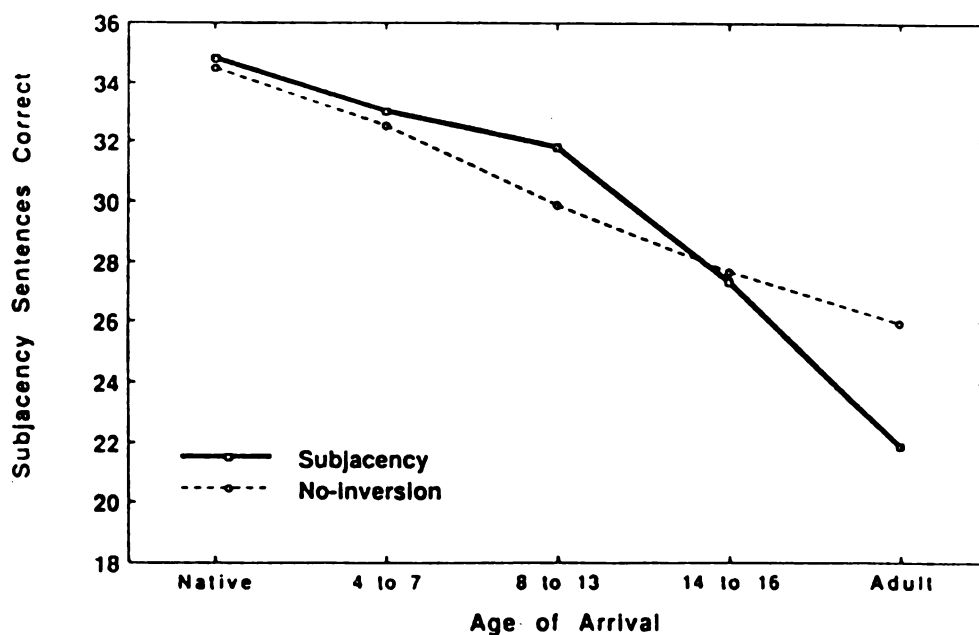


Figure 2 The relationship between age of arrival in the U. S. A. and number correct on subjacency test items and no-inversion test items.



Johnson and Newport then do a second experiment to observe effects of maturation on subjacency. In order to see the different patterns over a range of ages of acquisition, they find another 21 Chinese subjects, 9 males and 12 females, who learned English before adulthood. This group of subjects is selected to represent a group of younger learners whose age of arrival in the States was from 4 to 16, and their years in the States ranged from 5 to 15, with a mean of 9.6 years. All these younger subjects are undergraduate students, with the exception of two graduate students. Another difference with the first study is that none of the subjects in the second study had education in English before arriving in the States. The test procedure and materials were identical with those used in the previous study.

Johnson and Newport compare the results of the first experiment with the results of the second experiment. The younger learners of the second experiment were grouped by age of arrival into three groups: 4-7 (6 subjects), 8-13 (9 subjects), and 14-16-year-old arrival (6 subjects). Performance on subjacency violations and no-inversion sentences were displayed on Figure 2 (their Figure 7, p. 248).

As shown (see p. 33), only the youngest group (4-7-year-old arrivals) performed well on both types and was not different from the control group on Subjacency. Based on the results, Johnson and Newport claim that “there is a fairly continuous decline in the observance of Subjacency as age of exposure to the language increases” (p. 247). They say that “linguistic universals such as Subjacency become less accessible to the language learner with increasing maturation” (page 254).

Problems in Johnson and Newport's study

Johnson and Newport's study is a better and more convincing study than Schachter's study (1990). First, they narrow down their subject group to those with one language background. This step enables them to focus on the issue of Subjacency alone without possible interference that may involve other issues relative to linguistic aspects or language acquisition to some extent. Secondly, they provide enough test tokens per sentence type, and that increases the validity of their data. Furthermore, Johnson and Newport apply many statistical analyses to display their test results and to show the difference among subject groups, and we suggest that their argument is therefore more persuasive than Schachter's.

Nevertheless, we also find two crucial problems in their study and then suggest that their study also fails to rule out the role of UG in second language acquisition. We will first take a closer look at the subjects, especially those selected in the first study. We suspect that those adult L2 learners are not qualified to serve as advanced English learners, so they may not be the ideal subject pool for this study. Secondly, we point out that Johnson and Newport's analysis of the adult learners' test results is misleading to some extent; and, as we find out, the adult learners' performance on the Subjacency violations may not be much different from their performance on the control sentences. These two problems will certainly challenge the validity of Johnson and Newport's conclusion from their study. We discuss these two problems in detail in the following sections.

Subjects in Johnson and Newport's study

We believe that the adult subjects in their first experiment may fail to represent a proper subject pool of advanced English learners. Johnson and Newport did not provide any information, such as subject's TOEFL scores or scores of any other English placement test, about their subjects' language proficiency level. As we saw in the previous review section, the primary criteria of Johnson and Newport's subject selection are age of arrival in the States, 5-year minimum stay, and homogeneity of social background. Their average years of residence are 6.2 and their mean age of arrival is 25.8. It seems that these adult subjects all meet the criteria. Nevertheless, the problem is that these subjects are not necessarily qualified as advanced language learners even though they do meet all these criteria.

Although all 23 Chinese adult learners have a graduate level of education, we still do not know whether they are really qualified advanced English learners at the time of the test. Johnson and Newport say that their study "requires that subjects have sufficient competence in English to be tested on a principle which involves the use of complex sentences" (p. 229). And, as we mentioned above, they did not apply any standard language test to measure their subjects' English proficiency level prior to their study. Regarding their subject's English proficiency, the only statement that we can find from their article is quoted below.

Any subject who did not perform above chance on the simplest structure of our test, wh-movement in simple sentences, was eliminated. One subject was eliminated for this reason. (p. 229)

In other words, one subject was eliminated because he/she did not respond to at least half of the 12 simple grammatical wh-questions correctly. Nevertheless, Johnson and Newport did not provide us any information about the other 23 subjects who perform “above chance” on these 12 simple questions. We reasonably should see the mean number and the standard deviation of subjects’ responses on these 12 simple questions. Otherwise, we suspect that there probably exist significant differences among subjects’ English proficiency level, between above-chance performers and high-scoring performers.

Like Schachter, Johnson and Newport do not give us any information about possible variation among their subjects. These “above-chance” subjects may be indeed among the better speakers of English, and they actually had at least “above-chance” scores on all the tests as we can see in Figure 1. But they may not be good enough to be qualified as highly advanced subjects who are supposed to be ideal subjects for the study on Subjacency. Without further information provided in Johnson and Newport’s article, we simply do not know how good the subjects’ English really is.

Issues on Johnson and Newport’s analyses

Johnson and Newport apply many statistical analyses to strengthen their arguments in the study. But, there are some ambiguous results, presented in Figure 3 and Figure 4 which show crucial data to support their claim, and may be interpreted differently. If this is the case, then we suspect that the results are significant enough to support the conclusion that UG is not available to the adult learners.

In Figure 3, Johnson and Newport say that “adults learners find the subjacency sentences more unacceptable than the control sentences” (p. 236). Nevertheless, we can

clearly see that these Chinese have 24, or 67%, correct responses on the control type; and 22, or 61%, on subjacency violations. Is 6%, 2 test responses, difference between two sentence types significant enough to make such a claim?

There are two possible interpretations to address the subjects' performance here. One is that scoring merely 67% correctly in the control test indicates subjects' inadequate English proficiency. Therefore, one may anticipate that they will not do well on subjacency tests anyway. If this is true, as we discussed in the section on subjects, above, these adult learners may not be advanced English learners and are not proper candidates for the study on Subjacency.

The other possible interpretation is that these Chinese adult subjects simply do not like or are not good enough to handle long and complex wh-questions. As we know, the test sentences were recorded on tape and the subjects were asked to give yes/no answers after the questions were read. One may suppose that some (if not all) of these subjects judged short wh-questions as grammatical ones and long wh-questions as ungrammatical. If this is the case, one may not be surprised to see that the difference between the mean number of correct responses on control sentences and on the Subjacency sentences is little.

It is normal to predict that researchers will balance the length of sentence of their test sentences. Because Johnson and Newport do not mention any information about the length of their test sentence and do not include the full list of their test sentences in the paper, we simply do not know and therefore can only suspect this possibility.

Another possible misleading figure is Figure 4 (p. 237). The way that Johnson and Newport interpret Figure 4, which reports the mean number of "No" responses on

Subjacency test and control test items by native English and Chinese speakers, is more complicated than for Figure 3. Here, Johnson and Newport's analysis is to examine whether or not there might be a response bias to reject the wh-question sentences in general. To respond the test sentences correctly, the subjects are supposed to say "No" to the subjacency violation type of sentences and say "Yes" to those control sentences. Here it is not clear to us why Johnson and Newport compare the number correct in the subjacency violation type of sentences with the number incorrect in the control type as summarized in Table 3 below.

Table 3 Mean number of no responses on subjacency and control test items by subjects

	NO Responses in Subjacency	NO Responses in Control
Natives	35/ 97%	4/ 11%
Nonnatives	22/ 61%	12/ 33%

Accordingly, Johnson and Newport claim that "adult learners reject sentences with Subjacency violation more often than they reject the control sentences"--22: 12 or 61%: 33%. They further suggest that "there is some remaining tendency in the adult learner to obey Subjacency, and this tendency is not an artifact or either a response bias or a general belief that wh-movement cannot occur in complex sentences" (p. 237).

Johnson and Newport's statement here may lead one to come up with a false interpretation that adult subjects seem to do a better job on the Subjacency test. And, this false interpretation is certainly not consistent with what they have argued for in their article. Here we revise the comparison also by using the data of Figure 4. First, we compare the number of correct responses on Subjacency violations with the number of correct responses on control sentences. Then, we compare the number of incorrect

responses of Subjacency violations with the number of incorrect responses on control sentences, in Table 4.

Table 4 Mean number of correct responses and incorrect responses

	Correct responses on Sub. vs. Con.	Incorrect responses on Sub. vs. Con.
Natives	35 (97%) : 32 (89%)	1 (3%) : 4 (11%)
Nonnatives	22 (61%) : 24 (67%)	14 (39%) : 12 (33%)

The results here give us another view which is somewhat different from their report. As revised in Table 4, the results become 22 (61%) : 24 (67%) and 14 (39%) : 12 (33%). The difference of adult nonnative subjects' performance between judgment of Subjacency violations and control sentences, 6% (or 2 tokens precisely), is not significant at all. White (1996: 104) gives a possible explanation for the non-difference and suggests that "these L2 speakers might have grammars without long-distance movement, using pro as their empty category." Another explanation is that these subjects' English proficiency is actually not advanced enough although they may be better learners. They are able to perform only above chance on both the control sentences and the Subjacency violations.

In short, although Johnson and Newport's study is a much better study compared to Schachter's, there are still some problems as we discussed here. Accordingly we suggest that the results of their study remain ambiguous regarding ruling out the availability of UG in adult second language acquisition.

GENERAL DISCUSSION

Both Schachter's and Johnson and Newport's studies are in favor of the Critical Period Hypothesis to some extent. Schachter's conclusion gives a stronger version of the issue and her Incompleteness Hypothesis seems to propose that L2 acquisition is not attainable because the principles of UG remain idle if not triggered in L1 acquisition and the values for those triggered cannot be revised. Therefore, the acquisition of L2 is deemed to be incomplete. As we discussed in the previous section (3.3.1. on p. 29), Schachter seems to suggest that UG is a one-time chance and can only happen in L1 acquisition. That is, the decline of UG is abrupt.

For example, a Chinese child completes the acquisition of wh-questions in Mandarin at age of 3 or 4 presumably. According to Schachter's hypothesis (see our critique in 3.3.1. on p. 29), his/her language system does not include the principle of Subjacency to produce wh-questions, and therefore he will not be able to become an English native speaker even if he/she moves to the States since then. In another words, even for a child, to learn a second language is impossible. Of course, we do not believe and do not like to believe this is true.

Instead, Johnson and Newport propose a weaker version of the age effects and suggest that UG is under the maturational constraint and UG gradually declines with age. As we can tell from their Figure 7 (p. 248), subjects' performance on subjacency shows no significant difference, compared to the scores of the control group, up to the age group of 8 to 13. Therefore, according to Johnson and Newport's hypothesis, that Chinese child can still become an English native speaker, although most principles of UG were already

set when he/she acquired Mandarin as his/her L1. Perhaps he/she can achieve near complete English competence if he/she moves to the States before the age of 13.

We have discussed some crucial problems found in these two studies and then argue that both studies fail to claim that their adult subjects have no access to UG in English acquisition. What's in common to both studies is that their adult subjects are not the proper subject pool for the study on Subjacency. Subjects' English proficiency level is questionable in both studies; therefore, the validity of the test results of both studies is problematic. Nevertheless, as we mentioned in the introduction section, the purpose of this paper is not to argue for the availability of UG in SLA. We have to admit that the debate between the two opposite views on availability of UG in SLA will continue.

We also have to admit (or to accept) the common phenomenon that, unlike in L1 acquisition, most adult subjects have less (or little) chance to be successful in their L2 acquisition. To account for the difference between L1 acquisition and L2 acquisition, Bley-Vroman (1990) proposes the Fundamental Difference Hypothesis which suggests that UG is no longer accessible in L2 acquisition. He claims that the general failure of adult L2 learners indicates that UG is not applicable in L2 acquisition. Furthermore, the learner can only rely on those principles of UG triggered in L1 acquisition, and they have to adopt other general learning mechanisms such as analogy, reasoning, or hypothesis testing. Unfortunately, all these mechanisms are insufficient for learning a language, so the learner is no longer guaranteed to succeed in L2 acquisition.

Felix (1985, 1986) proposes the Competition Module Hypothesis that provides another explanation for the less successful L2 acquisition. He claims that UG is still available to the L2 learner but it has to compete with general learning mechanisms.

Unfortunately, the competition between UG and those learning mechanisms may result in some sort of interference in the domain of UG and then causes the failure of L2 acquisition.

Because of the general failure of L2 acquisition, superficially it seems easier to come up with the hypothesis that the difference between L1A and L2A entails unavailability of UG in SLA. We all may easily make such a claim because we will not have problems to find a lot of adult learners to support our argument. But, the truth is that there ARE highly advanced L2 learners who have near-native performance, and we then owe ourselves an explanation for that. Gregg (1996: 66) points out the fact that researchers who favor UG's unavailability in L2 acquisition need to show that "all successful examples of L2 acquisition can be accounted for either by 'transfer' of L1 grammatical properties to the IL grammar, or else by the application of learning mechanisms not intended specifically for acquisition tasks."

Most research in the field of SLA is inspired by Chomsky's "Government and Binding" (1981). Until this decade, researchers have tried to come up with all sorts of theories to account for L2 acquisition, whether for the success or for the failure. So far, as Long (1993: 225) claims, there are at least 40 to 60 theories in the field of SLA. The study of second language acquisition is still in a developing process. There is still plenty of work left to be done. Hopefully, in the near future we will have a better understanding and come up with a unique theory of second language acquisition, a linguistic theory which will benefit the field of second language education.

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