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Testing the Availability of Universal
Grammar in Second Language Acquisition:
The Governing Category Parameter and
the Proper Antecedent Parameter in
Japanese as a Second Language

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ABSTRACT

To solve the logical problem of L1 acquisition, a domain-specific Universal Grammar (UG) has been proposed. Is UG also available in adult SLA? There are three competing hypotheses with regard to this question in SLA literature: (1) the UG-Subset Principle Hypothesis (U-SPH), (2) the UG-Transfer Hypothesis (U-TH), and (3) the Fundamental Difference Hypothesis (FDH). They appear to be all theoretically motivated and empirically supported in the literature.

Two studies with specific experimental designs were devised to systematically compare and test these three hypotheses to answer the question of the availability of UG in adult SLA. In the first study, the acquisition of the Proper Antecedent Parameter in Japanese as a Second Language (JSL) was investigated in order to compare the U-SPH with the U-TH and the FDH, while the second study looked at the acquisition of the Governing Category Parameter in JSL in order to compare the U-SPH and the U-TH with the FDH. 48 native-speakers of English worked on a picture identification task in these studies. 16 native speakers (NS) of Japanese and 16 NSs of English also participated as control groups.

The results of the two studies supported the Fundamental Difference Hypothesis, which proposes that UG is no longer available in its entirety in SLA. UG is available only through L1. Suggestions were also made for the future research.

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LIST OF ABBREVIATIONS

Abbreviation

A	accusative case
BC	Binding Conditions
D	dative-locative postposition
df	degree of freedom
ESL	English as a second language
FDH	the Fundamental Difference Hypothesis
FSL	French as a second language
G	genitive case
GB	Government and Binding Theory
GCP	the Governing Category Parameter
GER	gerundive suffix
GJ	Grammatical judgment
H	hypothesis
High	Experimental group at the high proficiency level in JSL
iff	if and only if
IL	interlanguage
JSL	Japanese as a second language
k	number of blanks in a CLOZE test
K-R21	Kuder-Richardson formula 21
L	language
L1	first language
L2	second language
LAD	Language Acquisition Device
LEC	Length of exposure to L2 in the classroom Setting
LET	Length of exposure to L2 in total
LF	Logical Form
LOS	Length of stay in the county where the L2 is spoken
Low	Experimental group at the low proficiency level in JSL
LP	Learning Procedure
Mid	Experimental group at the middle proficiency level in JSL

MDP	Minimal Distance Principle
N	number of subjects
NEG	negative
NP	Noun Phrase
NS	native speaker
p	alpha level
p	parameter
PAP	the Proper Antecedent Parameter
PF	Phonetic Form
POL	politeness marker
PRS	present tense
PS	Problem solving system
PST	past tense
Q	question marker
r	correlation
r^2	coefficient of determination
RE	reading ease
RH	research hypothesis
S	sentence
SD	standard deviation
SLA	Second Language Acquisition
SP	Subset Principle
TOP	topic marker
UG	Universal Grammar
U-SPH	the UG-Subset Principle Hypothesis
U-TH	the UG-Transfer Hypothesis
VP	Verb Phrase
$\bar{X}$	mean, mathematical average
χ^2	chi-square

CHAPTER I
INTRODUCTION: UNIVERSAL GRAMMAR AND LANGUAGE
ACQUISITION

I. LOGICAL PROBLEM OF FIRST LANGUAGE ACQUISITION

The input to children learning a first language (Ll) appears to be insufficient to characterize the knowledge they acquire about ambiguity) paraphrase relations) scope, and ungrammaticality in L1 (Hornstein and Lightfoot 1981; Lightfoot 1982; White 1982). The input includes such performance errors as slips of the tongue, false starts, and incomplete sentences and thought) as well as well-formed sentences. Further, negative evidence is not reliably available to children (Braine 1971; Brown and Hanlon 1970; Slobin 1972; Wexler and Culicover 1980).[1] Even when it does occur, it is not consistently used or noticed by children (Brown 1973; McNeill 1966; Smith 1973). With such poverty of input and lack of negative evidence, it is "logically" impossible for the Ll child to "project" the adult grammar from the input alone. L1 learners, however) uniformly acquire a complete adult Ll grammar successfully in a relatively short period of time. Such gap between available experience and attained competence forms the "logical problem" (Baker and McCarthy 1981; Hornstein and Lightfoot 1981), "Plato's problem" (Chomsky 1980, 1986, 1987,1988)) or the "projection problem" (Baker 1979; Peters 1972) of Ll acquisition (L1A). An innate domain-specific Language Acquisition Device (LAD) has been suggested to answer this problem.[2]

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[1] Hirsh-Pasek, Treiman, and Schneiderman (1984) reported that mothers do correct ungrammatical utterances*and it was argued that negative evidence is available in Ll. As was pointed out by White (1985a, 1985c), however, the negative evidence in this study was available only for the errors made by two year olds and not available later. Thus, its availability is not reliable.

[2] This approach is also called a "modular model" of L1 acquisition (Bever 1974; Chomsky 1980,1984; Fodor 1983). An alternative to this model, the "unitary model," was suggested to answer this "logical problem" by Anderson (1983), O'Grady (1987a), Rumelhart and McClelland (1986, 1987), Schlesinger (1982), and Stemmer (1981). While the modular approach proposes a innate domain-specific LAD, the unitary model proposes a single "unitary" mental processor that performs all cognitive activities including language acquisition. In the former) the input from the environment is just a "trigger" to language acquisition (Lightfoot 1982). According to the latter*information supplied by the environment determines*to a large extent*what is learned. Beck (1989) listed seven characteristics of first language acquisition and argued that the modular approach can

Felix (1985), Phinney (1987), Ritchie (1978), and, especially, Bley-Vroman (1988,1989) summarized the structure of LAD. It is assumed to be made of **two** components: (1)Universal **Grammar (UG)** with universal and parameterized principles **(e.g. Chomsky 1981a, 1981b,** 1986) and (2) a set of **Learning** Procedures (LP), a means of **arriving** at a **grammar** based on available **data.**[3] The structure **of the** device **is** summarized below.

Structure of Language Acquisition Device (LAD)

(1) Universal Grammar (UG)
    (a) **universal** principles
    (b) parameterized principles
        (i) 'disjoint' parameters
        (ii) 'intersecting' parameters
        (iii) 'subset' parameters

(2) **LP**   **e.g.** Uniqueness Principle
           Isomorphism Principle
           Subset Principle

Within **this** broad approach, UG defines the initial **state** of **the** L1 learner's mind. It **limits** the range of possible grammars and reduces **the** amount of pure **guesswork** for the learner in **input** comprehension **and** production of novel utterances. UG consists of various subsystems of principles and some of these principles are parameterized. **This** account of parameterization is essential to **the** systematic **differences** between **languages,** and may contribute to the explanation of developmental **stages in** L1 acquisition **(Chomsky 1981a, 1981b; Hyams** 1986).

The operation of **LAD** involves the learner's setting of these parameters, which is triggered by the **input data (Chomsky 1981a, 1981b).** The

explain **the characteristics while the unitary model cannot. For more** details, see Beck **(1989).**

[3] These particular terms are those of **Bley-Vroman. Felix hypothesized** that the LAD is made of **(1) ?abstract principles** of the types that have been described in **linguistic** theory (cf. **Chomsky and Lasnik, 1977; Chomsky, 1981a)"** and (2) "**learnability** theory" (p. 51). Ritchie used (1) "a theory of linguistic competence" **and** (2) "a set of acquisitional strategies" (p. 34). Phinney utilized "Core Grammar" (p. 221) in relation to (1), but no specific term was given for (2).

LP helps the L l learner to amve at a particular **setting** (among all the **settings** allowed by UG for a parameter) based on available data.

Wexler and Manzini (1987) categorized parameters **into** the following three types in **terms** of relationship between possible values in parameters: (1) **'disjoint'** parameters, (2) 'intersecting' **parameters, and** (3) 'subset' parameters. Figures 1 through 3 schematically show these **three** kinds of parameters, where i and j are the values of a **linguistic parameter** p in two languages (L). **Each** of these requires a **different** type of LP for parameter setting.

The first **type** of **parameter,** the 'disjoint' parameter or "open" parameter (White 1986b: 7), has settings **which** are the "disjoint" set (See Figure 1). **This** parameter is * ' o p '' to **any** setting and **initial** input **in** L l determines a **setting** for the parameter. The **head-initial/head-final** parameter **(Stowell** 1981) is such a parameter with two settings, the **'head-**initial' and **the 'head-final' settings.**[4] English is a **head-initial** language, **while** Japanese is head-final. Consider **the** examples **in** (1).

(1) a. Charlie [vp studies Japanese].
  b. Charlie wa [vp **Nihongo** o benkyoo sh-imas-u].
    Charlie **TOP** Japanese **A** study **do-POL-PRS**[5]

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[4] **Certain** parameters such as **the Governing** Category Parameter (Wexler and Manzini 1987; Manzini and Wexler 1987) have more **than** two values. For instance, this particular parameter has five possible settings, However, for the sake of simplifying discussion at issue, a parameter with two possible settings **is** used here.

[5] The abbreviations stand as follows: N = nominative case, A = accusative case, G = genitive case, D = dative-locative postposition, L = locative postposition, TOP = topic marker, PRS = present tense, PST = past tense, GER = gerundive suffix, POL = politeness marker, NEG = negative, and Q = question marker.

4
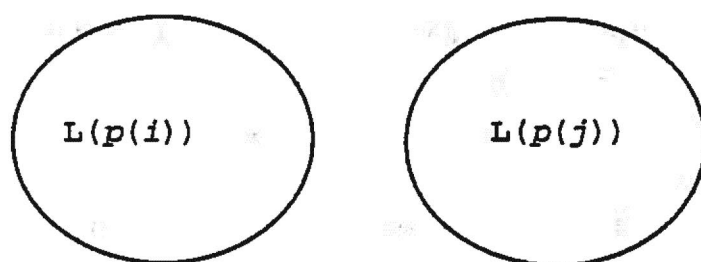
Figure 1. 'Disjoint' Parameter
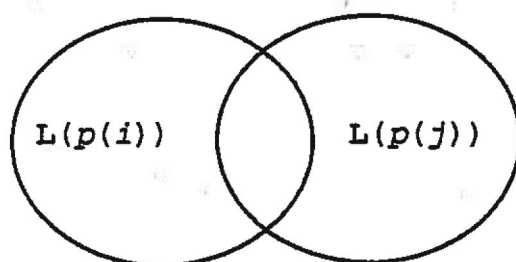
Figure 2. 'Intersecting' Parameter
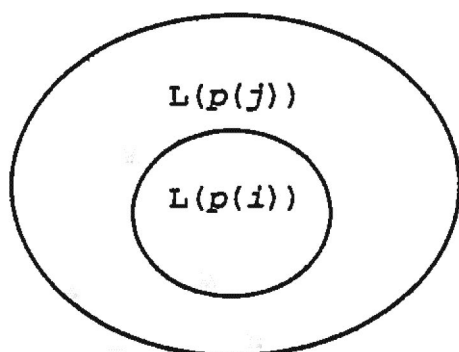
Figure 3 'Subset' Parameter

In the English sentence (1a), the verb "studies," the head of the Verb Phrase (VP), is at the initial position, whereas "benkyoo-shimasu (study)," the head of the VP in the Japanese sentence (1b), occurs in the phrase final position. At birth, a child is "open" to either setting, but a LP like the "Uniqueness Principle" (Berwick 1985) forces the child to select only one setting for a parameter based on any relevant LI input. If the child's initial exposure is English, the "head-initial" setting is selected and, if Japanese, the 'head-final" setting is chosen. Thus, the LP for setting values in this type of parameter is the Uniqueness Principle[6]:

> *The Uniqueness Principle*
> If there are two or more alternative settings of a single parameter, only one is permitted to survive.
> (Berwick 1985: 95)

For the second type of parameter, the 'intersecting' parameter (Figure 2), such as the AG/PRO parameter (Hyams 1986, 1987)[7], Hyams suggested the following Isomorphism Principle as its possible LP:

> *The Isomorphism Principle*
> All else being equal, the least complex grammatical system is the one which allows for the greatest degree of isomorphism between the various levels of representation; D-structure, S-structure, PF, and LF.
> (p. 162)

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[6] This Principle is closely related to the Uniqueness Principle by Wexler (personal communication) cited in Roeper (1981). As can be seen from the definition of the latter below, however, they are not exactly the same.

> *The* Uniqueness *principle*
> In the unmarked case every deep form has a single surface structure in syntax.
> (p. 141)

[7] Hyams (1987) appears to suggest that this parameter or "the pro-drop parameter" can be an "intersecting" parameter:

> ...in the version of the pro-drop parameter presented in this paper, English is a subset of Italian relative to the null-subject phenomenon, but Italian is a subset of English relative to the auxiliary system (e.g. we find inversion in tensed sentences in English but not Italian). (p. 20)

Thus, the initial **setting** for the second type of parameter is determined by this principle to be the one which gives the **"simplest"** grammatical system.

The third type of parameter, the 'subset' **parameter,** has **parameter** settings in a subset relationship, as illustrated in **Figure** 3. *One* model of a LP for this type of parameter **is the** "Subset **Principle (SP)"** (Berwick 1985; Manzini and Wexler 1987; Wexler and Manzini 1987). **Wexler** and Manzini summarized **the principle as** follows:

> Let i and j **values** of a linguistic parameter p. $L(p(i))$ is the language— we take a language to be a set of **sentences**——**which** is attained by letting p have the value i. Likewise for j. Then we can state the Subset Principle. Suppose $L(p(i)) \subseteq L(p(j))$. Then i is less marked **than** j. In acquisition terms, if i is a less marked **value than** j, **then** i is tried by the **learner before** j, and only positive evidence that i is **wrong** moves the learner to j. In the simplest case the positive evidence **can** be **just one sentence** S. S $\in$ $L(p(j)) - L(p(i))$; that is, one **sentence** S **which is** in $L(p(j))$ but not in $L(p(i))$. (p. 44)

This third type of parameter is closely related to the concept of markedness **(Trubetzkoy** 1936; **Jakobson** 1941; Chomsky and **Halle** 1968).[8] **As** stated above by Wexler and Manzini, the unmarked setting $(p(i))$ is the least general or the most restricted **grammar which** applies **to** ANY languages being leaned, and the marked setting $(p(j))$ is the most **general or** the least restricted grammar. The unmarked **setting then** is the "subset" of **the** marked $(p(i) \subseteq p(j))$. Transition from the unmarked setting $(p(i))$ to the **marked** $(p(j))$ needs positive evidence only, but the transition in the opposite direction

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[8] **As** noted by Gair (1988) for L1 acquisition and **McLaughlin** (1987) for SLA, researchers in language acquisition use various definitions of markedness. There are **two kinds** of markedness; **Greenbergian implicational** typological markedness and **Chomskian** markedness. The latter can be divided further into three sub-concepts of markedness. **They** are (1)"**C-markedness**" or markedness within Core **(Gair** 230-232), (2) "**CP-markedness**" or markedness relation **between** unmarked principles in Core and marked **ones** in Peripheral (ibid.: 232-233), and "**P-markedness**" or markedness within Peripheral **(ibid.:** 234). The **kind** of markedness adopted in **this** thesis is **C-markedness** within **Chomskian** generative syntax. **Eckman** (1977) and Zobl (1983) suggested their versions of markedness **theory** for SLA. **Eckman's** "Markedness Differential Hypothesis" uses markedness relations in universal grammar, but it is rather **implicational universals** based on the typological universals than intrinsic markedness as **assumed** in a parameterized grammar. Zobl's definition of markedness states that markedness is determined by the relationship between L1 and L2. The more data and revision required for a L2 learner to acquire a principle in L2, the more marked the principle is. **This** definition is relative rather than intrinsic.

requires negative evidence. Since the negative evidence is not reliably available and also it is not used even if it is available, the Subset Principle (SP) predicts on the basis of learnability theory that the learner's initial hypothesis be the unmarked case $(p(i))$ and the marked option $(p(j))$ is chosen only if motivated by specific positive evidence $(S \in L(p(j)) - L(p(i)))$.

Note here, however, that the SP as LP accounts only for the parameter setting of those parameters with their possible settings in a subset relationship and that other LPs are needed for other parameters. That is, the SP only works for parameters which conform to the Subset condition below.

> The Subset Condition
> For every parameter p and every two values i and j of p, the languages generated under the two values of the parameter are one a subset of the other, that is, $L(p(i)) \supseteq L(p(j))$ or $L(p(j)) \subseteq L(p(i))$.
> (Wexler and Manzini 1987: 60)

The innate domain-specific LAD with this general architecture is thus claimed to be available to the LI learners. Then, is the same language acquisition mechanism also available in adult second language acquisition (SLA)?[9] This is the general research question of the present thesis. In order to investigate the availability of the LAD in SLA, L1 acquisition and adult SLA will be compared here. Results of this study therefore have some implication to the "maturational constraints" studies (for review of these studies, see Long 1987), SLA theory building, and practice In language teaching as well as for the discussion of the "no growth" or "continuous" theory versus the "growth" or "maturation" theory in first language acquisition (Borer and Wexler 1987; Chomsky 1987; Felix 1984, 1988).[10,11]

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[9] In the remainder of this thesis, SLA refers to "adult" second language acquisition.

[10] Gleitman and Wanner (1982), Keil (1982), Klein (1982), Pinker (1984), and White (1982) proposed that grammatical development is a "continuous" process. That is, all the universal principles are present at birth and they "continue" to constrain language development. Crain and Nakayama (1984), Hsu (1981), Hyams (1986, 1987), Matthei (1978), Otsu (1981), and Phinney (1981), among others, have argued that this is the case. Actual development, however, often encounters various delays which characterize the developmental process. Borer and Wexler (1987) asked why some grammatical constructions are uniformly acquired later than others by L l children while they are endowed with all principles at birth. This

II. TRI-LEMMA IN SECOND LANGUAGE ACQUISITION

A review of the **SLA** literature suggests three competing hypotheses with **respect** to the question of the **LAD** availability in SLA: (1) the **UG-Subset Principle** Hypothesis, (2) **the** UG-Transfer Hypothesis, and (3) the Fundamental Difference **Hypothesis.**[12] Detailed discussion of these three hypotheses will follow in this section. As discussed in the previous section, there are **three** types of parameters. To **make** differences between the three hypotheses clear, however, **only** the 'subset' parameter will be used **in the** discussion since, as will be seen, these hypotheses predict different acquisition processes for this parameter.

2.1. The UG-Subset Principle Hypothesis (U-SPH)

That there is a logical problem for **SLA** as well as **L1A** has been proposed based on the observation of successful or reasonably successful cases of **SLA** (White 1985c; **Cook** 1985; **Zobl 1983).** The knowledge of ambiguity, of paraphrase relations, and of **grammaticality** in L2 which the advanced learners of the second **language (L2)** appear to possess is hard to ascribe solely to positive evidence from L2. **Hence,** the availability **of** the **LAD** has also been

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is the developmental problem of **Ll** acquisition. To **answer** this question, **Borer &** Wexler and Felix proposed the maturation hypothesis: certain principles mature at later points in the developmental process. Hyams **(1986)** added the following factors as possible factors which may affect the actual course of acquisition and cause delay in the developmental process and difficulties that the child may encounter: consideration of markedness and the **Core/Periphery** distinction and the **learning** of idosyntactic properties of lexical items. Hyams further insisted that the two hypotheses; continuous **and maturational,** are not in conflict with each other **by stating** that the language acquisition "continues" to be constrained by whatever the universal principles may be available at a certain stage in the development and, as long as it is constrained by universal principles, it is consistent with the continuous hypothesis although the **LAD** may "mature."

[11] Schachter **(1989b:11)** added the "window-of-opportunity hypothesis," the argument for the presence of critical period in acquisition of UG principles, to this "continuous" vs "maturational" hypotheses controversy.

[12] As a theoretically possible hypothesis on the availability of **UG in SLA,** White **(1989c)** added the fourth hypothesis, the **UG-is-dead** Hypothesis that "the L2 learner's language cannot be described in terms of UG parameters at all, not even the LI values" **(p.** 81). Clahsen and Muysken **(1986),** Clahsen **(1988a),** and Schachter (1988) seem to have advocated this position. As White pointed out, however, Clahsen and **Muysken** (1988) and Schachter (1989a, 1989b) have somewhat modified their claim that UG is not available. They currently assume the Fundamental Difference Hypothesis that **universal** principles **are** partially available but that parameters are not. **Thus,** this fourth hypothesis is not included in this thesis.

proposed for solving this "logical problem" in SLA. Empirical studies by Adjémian and Liceras (1984), Bley-Vroman, Ioup, and Felix (1988), duPlessis, Solin, Travis, and White (1987), Eckman (1977), Eubank (1989a), Felix (1988), Finer and Broselow (1986), Flynn (1983), Flynn and Espinal (1985), Hilles (1986), Hirakawa (1989), Ioup and Kruse (1977), Ioup and Tansomboon (1987), Kui (1988), Liceras (1989), Masterson (1988), Mazurkewich (1981,1988), Phinney (1987), Ritchie (1978), Suciadi (1989), and White (1985a, 1985b, 1986a, 1987b, 1987c, 1988b, 1989a) all appear to show that LAD is still operative in adult SLA. The position hypothesizing the availability of the LAD can be further divided into two sub-hypotheses: (1) the UG-Subset Principle Hypothesis and (2) the UG-Transfer Hypothesis.

The UG-Subset Principle Hypothesis (U-SPH) projects that the L2 learners reset parameters to the null hypothesis, the unmarked setting, for any new language regardless of the situation in L1. The initial unmarked setting may be changed to the marked by the Subset Principle (SP), the LP for this hypothesis (See Table 1). Results in Ioup and Kruse (1977), Liceras (1989), Masterson (1988), and Mazurkewich (1981, 1988) seem to support this hypothesis.[13]

2.2. The UG-Transfer Hypothesis (U-TH)

Empirical studies by Bley-Vroman et al. (1988), duPlessis et al. (1987), Eckman (1977), Flynn (1983), Flynn and Espinal (1985), Hilles (1986), Hirakawa (1989), Kui (1988), Phinney (1987), Suciadi (1989), and White (1985a, 1985b, 1986a, 1987b, 1987c, 1988b, 1989a) appear to suggest that L2 learners have an access to LAD but that they transfer L1 parameter settings to SLA. In this view, the LAD is available just as in the U-SPH, but the initial parameter setting in SLA is that of the learner's L1.

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[13] White (1983) argued against Mazurkewich's claim that, regardless of the markedness in the learners' L1, the developmental sequence is from unmarked to marked in the acquisition of dative questions. White pointed out that the Inuit subjects in Mazurkewich's studies consistently produced a higher percentage of marked constructions than unmarked.

Table 1 Components of Language Acquisition Device

L1A	(1) L2 by U-SPH	(2) L2 by U-TH	(3) L2 by FDH
I UG	UG	UG	Only part of UG that is accessible through L1
universal principles parameterized principles with all the possible settings available	universal principles parameterized principles with all the possible settings available	universal principles parameterized principles with all the possible settings available	universal principles parameterized principles with only the L1 settings available
Initial setting: unmarked	Initial setting: unmarked	Initial setting: L1 setting	Initial setting: L1 setting
II. LP (Subset Principle)	LP (Subset Principle)	Not specified Negative evidence(?) problem-solving(?)	Information processing Problem-solving system

The LP component of the LAD in this hypothesis! however, has not been specifically proposed in most of the studies subscribing to this hypothesis. Possible candidates for the LP in this hypothesis may be found in Schachter (1983,1984) and Felix (1976,1981,1985,1987,1988). Schachter pointed out that the failure to be understood in communication can be a form of negative evidence! and she proposed that such negative evidence may be used in a case where L1 is marked and L2 unmarked, while Felix suggested the use of general problem-solving system as the LP component of the LAD (see Table 1).[14], [15]

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[14] In Felix's (1976,1981,1985,1987~1988) 'Competition Model,' however, general problem-solving system as the LP 'competes' against UG and these competing systems produce wrong grammars. As Bley-Vroman (1989) correctly pointed out, this view cannot explain the findings in Asher and Garcia (1963) and Seliger, Krashen, and Ladefoged (1975) where mid-adolescents (who are quite likely to have both UG and the problem solving skills), on immigrating to foreign countries, appear to have acquired the L2 extremely well. Bley-Vroman suggested three other reasons to reject this model. For more, see the paper.

[15] White (1987b) discussed the differences between SLA from the UG theory perspective and SLA from the language transfer model. For the detailed discussion about the differences, refer to the paper.

Table 2 Summary of Empirical Studies Examining Availability of UG in SLA

	UG Principle[a]	L1[b]	L2	Level[c]	Age[d]	N	L1 control	Task(s)[e]	Results
Adjémian and Liceras (1984)	Relative clauses	FRN ENG	ENG FRN	LOW	adult	40	no	Elicited imitation Oral translaiton Written translation GJ, correction	U-TH
Bley-Vroman et al. (1988)	Subjacency ECP	KOR	ENG	HIGH	adult	92	yes	GJ, no correction,	U-TH
Clahsen and Muysken (1986)	German word order	ITL SPN POR TUR	GER	all —f	adult adult	48 9	yes	Interview Free conversation Formal eliciation —	FDH
duPlessis et al. (1987)	German word order	ENG FRN ENG	GER AFR	HIGH HIGH	adult adult	22 7 5	no no	Composition GJ and Structured conversation	U-TH
Felix (1988)	Superiority effects, parasic gap, control vs. ECM verbs, that-t-effects, subject condition, case filter effects, specified subject effects	GER	ENG	—	adult	48	yes	GJ, no correction, timed	U-SPH/U-TH
Finer and Broselow (1986)	Governing Category P	KOR	ENG	all	adult	6	no	Picture identification task	U-SPH/U-TH

a. UG principles/parameters studied. "P" in the table stands for "Parameter."
b AFR (Afrikaans), ARB (Arabic), CKN (Chinese), DUT (Dutch), ENG (English), FRN (French), GER (German), GRE (Greek), HUN (Hungarian), IND (Indonesian), INUT (Inukutitut), ITL (Italian), JPN (Japanese), KOR (Korean), PER (Persian), POL (polish), POR (Portugese), SPN (Spanish), TAG (Tagalog).
c. These are the reported proficiency levels of L2 learners; L or LOW (beginning), M or MID (Intermediate), H or HIGH (Advanced).
d This column specifies the time when the L2 learners started to learn the TL. 12 years old or below were considered "child" and 12 years old or above "adult."
e. GJ stands for Grammatical Judgment task.
f. "-" indicates information not available nor specified in the study.

Table 2 (Continued) Summary of Empirical Studies Examining Availability of UG in SLA

	UG Principle[a]	Ll[b]	L2	Level[c]	Age[d]	N	L1 control	Task(s)[e]	Results
Flynn (1983)	Head-initial/ head-final P.	SPN JPN	ENG	all	adult	51 53	no	Elicited imitation Act-out task	U-TH
Flynn and Espinal (1985)	Head-initial/ head-final P.	CHN	ENG	all	adutl	60	no	Elicited imitation,	U-TH
Hilles (1986)	Pro-drop P.	SPN	ENG	—	child	1	no	Spontaneous conversation Elicitation by games and experiment "Preplanned sociolinguistic interaction"	U-TH
Hirakawa (1989)	Governing Category P. and Proper Antecedent P.	JPN	ENG	—	adult	65	yes	Multiple-choice antecedent identification task	U-TH
Ioup and Kruse (1977)	Relative clause	SPN CHI PER JPN ARB	ENG	L/M	adult	18 16 18 10 25	no	GJ, not timed	U-SPH
Ioup and Tansomboom (1987)	tone		ENG	THI	LOW HIGH	adult adult	2 2	yes	Interview	U-SPH/U-TH
Kui (1988)	Pro-drop P.	CHN	ENG	M/H	adult	70	yes	GJ, correction, not timed.	U-TH
Liceras (1989)	Pro-drop P	ENG FRN	SPN	all	adult	30 32	yes	GJ, correction, translation	U-SPH
Masterson (1988)	Function Category P.	KOR	ENG	MID HIGH	adult	14	yes	Timed-response sentence matching	U-SPH
Mazurkewich (1981)	Dative alternation	FRN INU	ENG	all	adult	45 38	yes	Question formation, not timed	U-SPH

a. UG principles/parameters studied. "P" in the table stands for "Parameter."
b. AFR (Afrikaans), ARB (Arabic), CHN (Chinese), DUT (Dutch), ENG (English), FRN (French), GER (German), GRE (Greek), HUN (Hungarian), IND (Indonesian), INUT (Inukutitut), ITL (Italian), JPN (Japanese), KOR (Korean), PER (Persian), POL (polish), POR (Portugese), SPN (Spanish), TAG (Tagalog).
c. These are the reported proficiency levels of L2 learners; L or LOW (beginning), M or MID (Intermediate), H or HIGH (Advanced).
d. This column specifies the time when the L2 learners started to learn the TL. 12 years old or below were considered "child" and 12 years old or above "adult."
e. GJ stands for Grammatical Judgment task.
f. "-" indicates information not available nor specified in the study.

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Table 2.(Continued) Summary of Empirical Studies Examining Availability of UG in SLA

	UG Principle[a]	L1[b]	L2	Level[c]	Age[d]	N	L1 control	Tank(~)~[e]	Results
Mazurkewich (1988)	Infinitive/ gerund complement	INU	ENG	all	adult	52	no	Production test (sentence completion), not timed GJ	U-SPH
Phinney (1987)	Pro-drop P.	SPN ENG	ENG SPN	L/M L/M	adult	— —	no	Free composition	U-TH
Ritchie (1978)	RRC	JPN	ENG	—	adult	20	yes	GJ, paired, relative judgement no correction	U-SPH/U-TH
Schachter (1989a)	Subjacency	CHN KOR IND	ENG	HIGH	adult	20 21 20	yes	GJ, no correction, timed	FDH
Schachter (1989b)	Subjacency	DUT IND CHN KOR	ENG	HIGH	adult	18 21 20 20	yes	GJ, timed.	FDH
Shimura and Yoshino (1988)	Governing Category P & Proper Antecedent P.	JPN	ENG	all	adult	30	yes	Picture identificaiton task	FDH
Suciadi (1989)	Subjacency	IND	ENG	M/H	adutl	40	yes	GJ, timed	U-TH
White (1985a)	Subjacency	SPN FRN	ENG	all	adult	54 19	yes	GJ, not timed, correction, not timed	U-TH
White (1985b)	Pro-drop P.	SPN FRN	ENG	all	adult	54 19	no	GJ, not timed, correction	U-TH
White (1986a)	Pro-drop P.	SPN ITL FRN	ENG	all	adult	32 2 37	no	GJ, correction, timed. Question formaiton	U-TH

a. *UG* principles/parameters studied. "*P*" in the table stands for "Parameter."
b. AFR (Afrikaans), ARB (Arabic), CHN (Chinese), DUT (Dutch), ENG (English), FRN (French), GER (German), GRE (Greek), HUN (Hungarian), IND (Indonesian), INUT (Inukutitut), ITL (Italian), JPN (Japanese), KOR (Korean), PER (Persian), POL (polish), POR (Portugese), SPN (Spanish), TAG (Tagalog).
c. These are the reported proficiency levels of L2 learners; L or LOW (beginning), M or MID (Intermediate), H or HIGH (Advanced).
d This column specifies the time when the L2 learners started to learn the TL. 12 years old or below were considered "child" and 12 years old or above
e. GJ stands for Grammatical Judgment task.
f. "-" indicates information not available nor specified in the study.

Table 2. (Continued) Summary of Empirical Studies Examining Availability of UG in SLA

	UG Principle[a]	L1[b]	L2	Level[c]	Age[d]	N	L1 control	Task(s)[e]	Results
White (1987b)	ECP—'that-trace' violation	DUT	ENG	HIGH	adult	62	yes	GJ, paired sentences	U-TH
	Adjacency	FRN	ENG	—	child	36	yes		
White (1987c)	Datives	ENG	FRN	all	adult	14	no	GJ, correction, not timed	U-TH
		CHN				5			
		POR				2			
		GRK				2			
		TAG				1			
		POL				1			
		ARB				1			
		HUN				1			
		ENG		all	child	151	yes	GJ, timed, no correction	
White (1988b)	Subjacency	FRN	ENG	all	adult	43	yes	GJ, not timed, multiple-choice, correction	U-TH
	ECP			~	child	23		GJ, timed, no correction Comprehension (Q & A)	
White (1989a)	Adjacency	FRN	ENG	MID	adult	43	yes	GJ, timed, no correction,	U-TH
				—	child	52		GJ, not timed, multiple-choice with no correction GJ, paired sentences	

a. UG principles/parameters studied. "P" in the table stands for "Parameter."
b. AFR (Afrikaans), ARB (Arabic), CHN (Chinese), DUT (Dutch), ENG (English), FRN (French), GER (German), GRE (Greek), HUN (Hungarian), IND (Indonesian), INUT (Inukutitut), ITL (Italian), JPN (Japanese), KOR (Korean), PER (Persian), POL (polish), POR (Portugese), SPN (Spanish), TAG (Tagalog).
c. These are the reported proficiency levels of L2 learners; L or LOW (beginning), M or MID (Intermediate), H or HIGH (Advanced).
d. This column specifies the time when the L2 learners started to learn the TL. 12 years old or below were considered "child" and 12 years old or above "adult."
e. GJ stands for Grammatical Judgment task.
f. "-" indicates information not available nor specified in the study.

2.3. The Fundamental Difference Hypothesis (FDH)

Unlike the above two hypotheses, the **Fundamental Difference** Hypothesis (FDH) predicts, based on the detailed discussion of ten fundamental characteristics of SLA,[16] that the LAD is no longer **available in SLA** (Bley-Vroman 1988, 1989). Instead, the UG component of the LAD **was** replaced by the conscious **and** unconscious knowledge of the learner's LI a**nd the** LP by the **general information** processing and problem-solving (PS) system. (See Table **1) This position** seems to be empirically supported by **Clahsen (1988a)** and **Clahsen** and **Muysken (1986, 1988), Schachter (1989a, 1989b),** and **Shimura** and **Yoshino** (1988).

Bley-Vroman, however, was not **explicit about wha**t it **is meant by** "knowledge of **the** learner's **L1"** for the first component of **LAD.** This raises the possibility that the **FDH is n**ot in fact different from **the U-TH. Eubank** (personal communication), **for** instance, has **questioned** the **distinction between** (his **hypothesis** and the previous U-TH, saying that both see**m to** predict the L1 setting for the initial **setting** in **SLA. H e** then suggested collapsing **of the** two hypotheses. This, however, can not be supporte**d here** because, as w**ill** be demonstrated below, close comparison of these tw**o** hypotheses in terms of the first component of the LAD and of the **acquisition** processes predicted by them suggests a clear difference between them.

The first component of LAD, UG, has **two** types of principles in LI **acquisition;** universal principles and parameterized principles. **Clahsen and Muysken (1988),** who subscribe to **the** FDH, have suggested that universal principles such as structural dependency are still accessible to **SLA** but that the

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[16] **Bley-Vroman (1988, 1989) listed the following ten fundamental characteristics of SLA to support his FDH:**

    (1) Lack of success; success is not guaranteed
    (2) General failure; rare complete success
    (3) Variation in success, course, and strategy
    (4) Variation in goals; type of attainment
    (5) Negative correlation of age and proficiency
    (6) Fossilization
    (7) Indeterminate intuitions
    (8) Importance of instruct**i**on
    (9) Negative evidence
    (10) Role of affective factors.

parameterized principles are no longer available with their open parameter
settings. These open settings are considered to have **already** been fixed in **the**
L1A and they cannot be reset. **Schachter (1989a, 1989b)** also argued for what
she calls **'the** third position', namely the FDH here, that "UG in its entirety is
no longer available to the language learner after the critical period" and that
"the adult second language learner would have available for acquisition of
the target language only the principles and parameter settings instantiated **in**
the first language." **(1989b:** p. 75)

On the other hand, The **U-TH** predicts that **SLA** process has full access
to both universal and open parameters. **This** difference in the
presence/absence of the parameters with open **settings** clearly separates the
FDH from the **U-TH.**

Both hypotheses predict that a second language acquirer starts from L1
settings and uses PS. According to the FDH which proposes that **the** UG in its
entirety is no longer available and that the UG no longer restricts the number
of possible values for parameters, **the** SLA process will be a transition **from** LI
settings to unspecified values, including perhaps values not allowed by UG.
On the other hand, **the** second language learner according to the **U-TH** still
has an access to UG and moves from LI settings to specific UG-permitted
settings, that is, the settings constrained by UG.

When the values of a parameter in LI and L2 are the same, learners
will not have any problems according to both of these hypotheses. **When** the
values are different, however, these **two** hypotheses could lead to different

Table 3 **SLA Process** as Predicted by **the** FDH **and the U-TH**

	Initial setting	LP	Target Setting
FDH	L1	PS	non-specific setting not restricted by UG
U-TH	L1	PS	setting restricted and specified by UG

expectations concerning the learner's difficulty in acquiring a L2 setting.
With the number of possible parameter values restricted by UG, acquisition of
a L2 parameter setting according to (he U-TH should be easier and hence,
perhaps, take less **time** than that according to the **FDH,** where the L2 learners

without UG have to find the L2 setting among numerous possibilities. Therefore, the distinction between the two hypotheses can be maintained.

III. RESEARCH DESIGN TO SOLVE THE "TRI-LEMMA" IN SLA

Each of the three hypotheses predicts a different *status* of the LAD and its two components in SLA; each is theoretically motivated; and each has some empirical support. Nevertheless, they cannot logically be simultaneously **true,** nor can **they** be complementary in any obvious sense. The general research question of the present study stated in Section I of this chapter can then be modified to be a more specific one: Which of the **three** hypotheses can best explain the SLA process, the U-SPH, the U-TH, or the FDH? In order to answer this research question and solve this "tri-lemma,"[17] two specific experimental **designs** were devised so (hat the three hypotheses can be systematically compared and **tested.**

3.1. The Logic of the First Study

White (1983) summarized eight possible relations between LI and L2 in terms of parameter settings (see Table 4). The first study of the present thesis examines a situation in which **the** value of a certain 'subset' parameter in a L2 learner's L l is marked **and** that of his/her L2 is unmarked (the case (vii) in Table 4). In this case, the three hypotheses predict following SLA processes. See Table 5.

Table 4. —— Possible Relations Between L1 and L2 in Terms
of Parameter **Settings**

	Native Language (LI)	Target Language (L2)
i.	Unmarked	Unmarked
ll.	——	Unmarked
iii.	Unmarked	Marked
iv.	Unmarked and Marked	Unmarked and Marked
v.	X	Y
vi.	——	Marked
vii.	Marked	Unmarked
viii.	Marked	Marked

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[17] As opposed to "di-lemma" meaning "two hypotheses" in Greek.

Table 5 Predictions of Three Hypotheses for the First Study

	U-SPH	U-TH	FDH
Initial L2 setting:	unmarked	marked	marked
Learning Procedure:	Subset Principle	Negative evidence Problem solving	Problem Solving
Resulting L2 setting:	unmarked	unmarked	non-specific value
L1 parameter setting:	"marked"		
L2 parameter setting:	"unmarked"		

According to the U-SPH, the LAD with parameterized UG and the SP as LP is available to L2 learners. The initial setting is predicted by the hypothesis to be unmarked. Since the L2 is also unmarked, the acquisition of this parameter is supposed to be easy and therefore early in the SLA development. By "early" it is meant that this particular L2 parameter setting is achieved in the L2 learners even at the low proficiency level. This hypothesis thus predicts:

> The acquisition of L2 setting in this parameter is easy and early. The parameter setting of L2 learners at the low proficiency level is not different from that of the native speakers of the learners' L2. (H1-a)

The U-TH, on the other hand, hypothesizes that the initial setting be that of LI, that is, marked. Initially, the L1 setting is transferred to the L2. Since the L2 target setting is unmarked and negative evidence is needed for such transition from the marked to the unmarked settings, acquisition of the L2 setting would be difficult and take tune. Unless negative evidence concerning this particular parameter is given, the L2 learners even at the highest proficiency level will still show L1 'setting. "Fossilization" (Selinker 1972) of the LI setting may result (White 1983). Thus, if the U-TH is correct and also if negative evidence is not available, the acquisition of this parameter is difficult for the L2 learners at all proficiency levels——low, middle, and high. This hypothesis therefore predicts:

The acquisition of L2 setting in this parameter is difficult and late. The parameter setting of L2 learners at proficiency levels of low and middle, and, possibly, of high is different from that of the native speakers of the learners' L2. **(H1-b)**

The above is predicted, if the **U-TH** is correct and ——it must be emphasized ——if negative evidence is not available. This second condition that negative evidence is not available is quite important in this study using L2. In LI acquisition, negative evidence was not reliably available. In SLA, however, negative evidence in the form of explicit instruction of grammatical rules or corrections is quite likely to be available for certain parameters, especially in the case of **SLA** in the formal classroom settings. This second condition then requires in this study the use of a parameter about which it is reasonable to assume that no negative evidence is available.

In the third hypothesis, the FDH, the UG is replaced by the L1 knowledge, conscious and unconscious, and the initial setting would be that of LI, marked. However, as discussed in Section 2.3 above, the UG in its entirety with the parameterized principles is no longer available according to this hypothesis, so no specific target value is available to the L2 learners, either. Parameter setting is no longer constrained by UG. Since the LP is general problem-solving skill without any specific target, unless relevant negative evidence is available, acquisition of the L2 setting will be difficult and take time. Therefore, if the FDH is right and also if negative evidence is not available, acquisition of this parameter is difficult for L2 learners at all proficiency levels ——low, middle, and high. Fossilization of the LI setting is again predicted. Although the predicted processes are different, the results in the acquisition of this parameter on the basis of the last two hypotheses would thus appear similar. Both predict late acquisition of the L2 setting. Therefore, the FDH also predicts Hypothesis (H1-b) above. This prediction, however, is based on the condition that negative evidence is not.available, so a parameter for which no negative evidence is available has to be used in this study.

The FDH may further predict more delayed acquisition of the L2 parameter setting than the U-TH, because of the unavailability of UG in its entirety, as discussed in Section 2.3.

In summary, the U-SPH projects that acquisition of this particular parameter setting in L2 would be easy and that the acquisition takes place from the early stage of SLA, whereas the U-TH and the FDH both predict difficulty in its acquisition and that the acquisition might not happen until later stages of SLA, if it should happen at all. A possible further delay in the acquisition according to the FDH was also suggested.

Since the prediction by the U-TH and the FDH is based on the assumption that negative evidence is not available in input, a parameter for which this assumption is justified should be used in the first study.

This first experimental design thus enables us to study possible differences between the U-SPH on one side and the U-TH and the FDH on the other and possibly between the latter two hypotheses. Notice that the time that the acquisition of this particular parameter takes plays an important role in this first study. This research design thus requires experimental groups at two or more proficiency levels.

In the present thesis, the Proper Antecedent Parameter (PAP) will be used for this first study. English is the marked L1 and Japanese is the unmarked L2. Subjects will be native-speakers (NS) of English learning Japanese as a second language (JSL).

Negative evidence for this parameter is not available in JSL. Interviews with eight experienced teachers of JSL was conducted, and it was found that these teachers were not aware of such parametric contrast between Japanese and English and that they had never explicitly taught such contrast. A survey of JSL text books (Alfonso 1966; Hibbett and Itasaka 1967; The Japan Foundation 1986; Japanese for today 1973; Japanese Language Promotion Center 1970; Jorden and Noda 1987; Mizutani, Arahari, Ikeda, Ikeo, Mizutani, Ohta, Otsubo, and Takagi 1979, 1980; Mizutani and Mizutani 1977; Niwa and Matsuda 1966; Young and Nakajima 1967) and Japanese-English bilingual dictionaries (Inoue 1983; Kaigai Gijutsusha Kenshuu Kyookai (AOTS) 1970; Kanda 1983; Miura 1983; H. Takahashi and K. Takahashi 1984; M. Takahashi and H. Takahashi 1989; Vaccari and Vaccari 1958) was also conducted to see if any negative evidence in the form of explicit rules was available to JSL learners, but no such evidence was found.

Detailed discussion of the Proper Antecedent Parameter itself **will** be postponed until the next chapter, so that we cart go on to **discuss** the logic of the second **study.**

3.2. The Logic of the Second Study

The second study **examines a** situation **where** the **L1** value of a **'subset'** parameter is **unmarked and the** L2 is marked, the case (iii) in Table 4. In this case, the three hypotheses **predict** following **SLA** processes. See Table 6 below.

Both the U-SPH and the **U-TH** predict the transition from the m a r k e d to. the marked settings, which must be easy and relatively early, because it requires **only** positive **evidence** readily available in **the** L2 input.

"Table 6   Predictions of **Three Hypotheses** for the Second **Study**

	U-SPH	U-TH	FDH
Initial L2 setting:	unmarked	unmarked	unmarked
Learning Procedure:	Subset Principle	positive evidence	Problem Solving
Resulting L2 setting:	marked	marked	non-specific value
L1 parameter setting	"marked"		
L2 parameter setting:	"unmarked"		

Acquisition of the L2 parameter setting at a relatively early proficiency level is predicted by **these** two hypotheses.

> The acquisition of L2 **setting in** this parameter is **relatively** easy and early. The parameter **setting** of L2 **learners** at proficiency levels of low and middle, and, **definitely,** of high is the same as that of the native speakers of **the** learners' L2. (HZ-a-i)

Still, acquiring the L2 value of this particular parameter requires some input **with** relevant positive evidence. The number of learners successfully acquiring this parameter **may increase** as the amount of exposure to the L2 increases. **Thus,** performance of learners in **this study** may positively correlate **with** the amount and/or **quality** of input. **This** calls for collection of such data as (1) the length of exposure to L2 **in total (LET),** (2) the length of

exposure to L2 in the classroom setting (LEC), and (3) the length of stay in the country where the L2 is spoken (LOS). These two hypotheses then predict:

> Subjects' performance in the second study positively correlate with (1) length of exposure to L2 in total (LET), (2) length of exposure to **L2 in** a classroom setting (LEC), and (3) length of stay in a country where the L2 is spoken (LOS). (H2-a-ii)

According to the FDH, the L2 learner also starts with the L1 setting, but, since UG is no longer available in its entirety and the number of possible settings for parameters is not restricted, problem-solving as the LP leads L2 learners to unpredictable settings. To reach the target L2 setting will be difficult and take time, if relevant negative evidence is not available. The FDH predicts:

> The acquisition of L2 setting in this parameter is difficult and late. The parameter setting of L2 learners at all proficiency levels is different from that of the native speakers of the learners' L2. (H2-b-i)

The U-SPH and the U-TH both predict a possible positive correlation between subjects' performance in the second study and some indices of quantity and quality of input the L2 learners receive, because positive evidence plays an important role in relaxing the unmarked parameter setting to the marked L2 setting. The FDH, on the other hand, predicts that acquisition of the L2 setting requires more than positive evidence.

Since the acquisition process is not constrained by UG due to lack of availability of UG in its entirety, the L2 learners have to find the correct L2 setting out of numerous possibilities with the help of the problem-solving skill as the LP. Thus, successful attainment of the L2 setting may result from numerous hypothesis-testings. Probably this would at least require negative evidence in the form of explicit instruction of relevant grammatical rules or error correction. If such evidence is not available, the FDH projects:

> Subjects' performance in the second study does not correlate with (1) length of exposure to L2 in total (LET), (2) length of exposure to L2 in a classroom setting (LEC), and (3) length of stay in a country where the L2 is spoken (LOS). (H2-b-ii)

Note that the above two predictions by the FDH are based on **the** assumption that **negative** evidence is not available. This again requires the use of **a** parameter for **which** negative evidence is not available.

Thus, the second study compares the U-SPH and the U-TH with the FDH. **In** order to see if **the** acquisition process is **easy/difficult** and **early/late,** the experimental group **once** again needs 'to include **a** few subgroups of different proficiency levels.

The Governing Category Parameter **(GCP)** will be used for **the** second **study. English** is **the** unmarked L1 **and** Japanese is **the** marked L2 with respect to **this** parameter, **and NSs of English** leaning **JSL will** be used as **the** experimental subjects. Interviews with eight experienced **JSL teachers** and a **survey of JSL** text **books** and bilingual dictionaries **were** conducted, but no negative evidence relative to **this** parameter **was** found to be available in JSL. **This** parameter as well as **the** Proper Antecedent Parameter for the **first** study will be discussed **in** detail **in the** next chapter.

By conducting an experiment of **this** logic, with these **two studies,** it is hoped that we can systematically compare **the** three competing hypotheses and answer the research question of **the** present study: Which of the three hypotheses best predicts the SLA process, the **U-SPH, the U-TH, or the FDH?**

Table 7
Summary of the Purposes of the **Two** Studies

First Study:	**U-SPH vs. U-TH and FDH**
Second Study:	**U-SPH** and **U-TH vs. FDH**

In this chapter, **the logical problem** of **first** language acquisition (L1A) **was** first discussed. It was found that **this** problem requires the **availability** of the innate domain- **specific Language** Acquisition Device (LAD) which is made of two **components:** (1) **Universal Grammar** (UG) with **universal** and parameterized principles and (2) **Learning Procedures** (LP). Is **this** LAD **also available** in second language acquisition (SLA)? There **are three** competing hypotheses with respect to **this** question in SLA. (1) the **UG-Subset Principle** Hypothesis **(U-SPH),** (2) the UG-Transfer ,Hypothesis **(U-TH), and** (3) **the**

Fundamental **Difference Hypothesis (FDH). These** three hypotheses attempt to explain a single phenomena?and they form "tri-lemma" in **SLA.** To solve **this** problem, **two** studies using two different **kinds** of parameters are devised, **These** two studies are to **systematically** compare and test **the** three hypotheses.

      The Proper Antecedent Parameter *(PAP)* and the Governing **Category** Parameter (GCP) **will** be used in the first and second studies?respectively. **In** the next chapter, these parameters will be discussed **in** detail **from the Government and Binding Theory perspective proposed in Chomsky (1981a).**

CHAPTER **II**

THE GOVERNING CATEGORY PARAMETER AND THE PROPER
ANTECEDENT PARAMETER

I. GOVERNMENT AND BINDING THEORY AND THE BINDING CONDITION

1.1. Government and Binding Theory

The **basic assumption** of **modern linguistic** theories is **that** the grammar is "modular," consisting of several **interacting** subcomponents, each of which has **distinct** properties. In **Government** and **Binding** Theory (GB) **(Chomsky 1981a),** there are four levels of linguistic representations: D-structure, S-structure, Phonetic Form (PF), and Logical Form (LF). A sentence S is grammatical if and **only** if (iff) it has a well-formed representation at each **linguistic** level. The organization of the grammar under the GB framework is **schematized** in Figure 4.
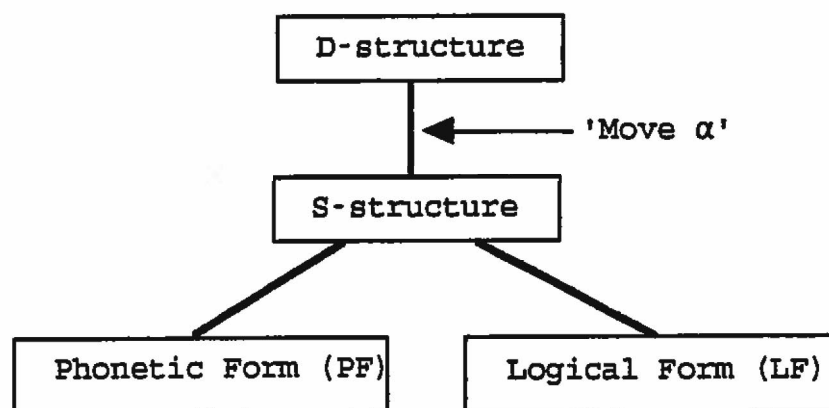
Figure 4   Organization of UG

In current theory, **D-structures** are consequences of a general theory of phrase **structure (X-bar** theory), together **with** the requirements of lexical items. **S-structures** are derived by application of transformational rules which **may** be considered as instantiations of the general schema **'Move α.'** **The** mapping from S-structure to PF is referred to as the "phonology" or the

"phonological **component." LF is a represen tation of those aspects of** meaning which are determined **by se**ntence grammar.

1.2. The Binding Conditions (BC)

The Binding Conditions (BC) constrain the distribution of Noun Phrases (NP) at S-structure. The **BCs** distinguish three classes of NPs; anaphors, pronouns, and referring expressions. Anaphors include reflexive and reciprocal pronouns, NP trace, and **PRO.** Pronouns include lexical **(non-anaphoric)** pronouns and the empty categories pro and PRO.[18] Referring expressions (R-expressions) include names and definite and indefinite descriptions. **The BCs** are **given** below:

The Binding Conditions
A.   An **anaphor** is bound in its governing category.
B.   A pronoun is free in its governing category.
C.   An R-expression is free.

The definition of the notion "bound is as follows:

a is bound by β iff a and β are coindexed, β c-commands *a,* and β is an argument position (A-position).

An A-position is a position in which **an** argument may appear at D-structure, **e.g.,** subject, object, or indirect object positions. The definition of c-command is:

a c-commands β if the first maximal projection dominating a also dominates β, and a does not contain β.

The governing categories in the **Binding** Conditions, however, are subject to parametric variation. **Manzini** and Wexler (1987) and Wexler and **Manzini** (1987) have proposed **the** Governing Category Parameter (GCP) **and** the Proper Antecedent Parameter (PAP), which interact with **the Binding** Theory. Although the GCP **will** be used in the second **study** and the PAP in

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[18] The empty categories pro **and PRO will not be relevant to the study.**

the first in the present thesis, definitions of these two parameters will be discussed in this order, as in Wexler and Manzini.

II. PARAMETERS USED IN THE PRESENT STUDY: THE GOVERNING CATEGORY PARAMETER *AND* THE PROPER ANTECEDENT PARAMETER

2.1.1. The Governing Category Parameter (GCP)

Wexler and Manzini (1987) have proposed that the definition of governing category be associated with five parametric values as follows:

Governing *Category* Parameter
y is a governing category for a iff γ is the minimal category which contains **a,** a governor for a and has:

a. a subject; or
b. an INFL; or
c. a TNS; or
d. an 'indicative' TNS; or
e. a 'root' TNS.

Languages that contain anaphors found along this hierarchy are English for the type (a), Italian for (b), Russian for (c), Icelandic for type (d), and Korean and Japanese for (e). This is illustrated in the following example (2).

(2) James$_i$ said that Mike$_j$ requires that Craig$_k$ persuade Dick$_l$ to consider Robert$_m$ fond of himself$_x$.

In a **type** (a) language such as English, x can only equal m. X may equal either I or m in a **type (b)** language, k, l, or m in the **type (c) language,** and j, k, l, or m in a type **(d) language.** Finally in a **type (e) language** such as Korean and Japanese x may equal any of t, j, k, l, or m. English and Korean/Japanese are at the two extreme ends on a parameter setting continuum of this Parameter according to this hierarchy.

Wexler and Manzini noted that, under the assumption of the Subset Principle, type (a) languages, with *the* most restricted governing category, must be unmarked, which is the initial setting of this parameter with five values.

In English, the reflexive and its antecedent obey what may be roughly called a "clausemate" condition ——we shall say that they are "local" ——,

while, in Korean and Japanese, the antecedent for the reflexive *caki /jibun* may be "local" or it may be several clauses away from the reflexive, "*on-local."

2.2. The Proper Antecedent Parameter (**PAP**)

An **anaphor** has to be bound by a **proper antecedent in** the governing category. The **proper** antecedent is also subject to parametric variation. Wexler and **Manzini defined** the Proper Antecedent Parameter (PAP) as follows:

> *The Proper Antecedent Parameter*
> A proper antecedent for a is
> > a. a subject β; or
> > b. any element β.

Japanese is the type **(a)** language and English is the **type (b)**. In Japanese, only a subject can be **the** antecedent of a reflexive while, in English, any element, either subject or object, is a potential **antecedent.**[19] This is illustrated by the sentences in (3).

(3) a. **Karen**$_j$ wa **Maasa**$_i$ ni **jibun**$_x$ no shashin o **mise-ta.**
     Karen TOP **Marth** D self G picture A **show-PST.**
     'Karen showed Martha a picture of herself.'
  b. **Karen**$_j$ showed **Martha**$_i$ a picture of **herself**$_x$.

In (3), x may be equal to either j or i in **English,** the type (b) language, but x may only equal j in the **type** (a) language like Japanese. Under **the** assumption of the Subset Principle, Japanese is unmarked **and** it is **the** initial setting for the **PAP.** That is, **the** subset relation between the **two** languages is reversed from that of the GCP. **See** Table 8 below.

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[19] Kameyama (1984) listed four types of counter-examples to this subjecthood conditions in Japanese. The property of "Logophoricity" was suggested instead to replace the subjecthood condition and to account for the counter examples. All the experimental sentences in the present study, however, follow the original PAP in Wexler and Manzini and this version was adopted here. See Kameyama for further discussion. See also Clements (1975) for definition of "Logophoricity."

Table **8.** —— Relationship of Japanese and English
with Respect to the Governing Category Parameter
and the Proper Antecedent Parameter

	Japanese	English
Governing Category Parameter	marked	unmarked
Proper Antecedent Parameter	unmarked	marked

2.3. L1 Data from the Previous Studies

Several empirical studies have examined these two parameters. For each parameter, we will review (1) data from studies investigating how L1 children acquire the LI parameter setting and (2) data from a study investigating the final state of the parameter setting in adult L1 speakers.

2.3.1. L1 Data for the Governing Category Parameter
2.3.1.1.1.   Developmental Data for Japanese L1

Otsu (1987b) tested 15 children aged 3 to 5 to investigate the parameter-setting process of the GCP in Japanese L1. The following sentences in (4) and (5) were juxtaposed and presented to the children, and they were asked to point out "strange" sentences, if any, and to explain what was "strange." ,

(4)   Okaasan   wa   otoosan   ga   Taroo   ni   jibun no   sukaato   o
      Mother   TOP   Father   N   Taroo   D   self G   skirt   A

      mise-ta   to   ii-mas-ita.
      show-PST   COMP say-POL-PST.
      'Mother said that Father showed Taroo self's skirt.'

(5)   Otoosan   wa   Taroo   ga   okaasan   ni   jibun no   sukaato   o
      Father   TOP   Taroo   N   Mother   D   self G   skirt   A

      mise-ta   to   ii-mas-ita.
      show-PST   COMP say-POL-PST.
      'Father said that Taroo showed Mother self's skirt.'

Table 9 below shows the results of the study.

Table 9   Results from Otsu (1987b)

	3 year olds	4 year olds	5 year olds
N	5	5	5
Of (4) and (5),			
(5) is "strange":	0	2	3
Both are "strange":	1	2	2
Unable to process these sentences:	4	1	0

According to the GCP, the parameter setting for Japanese is marked and this allows not only the clausemate local "father" in (4) and "Taroo" (a male name in Japanese) in (5) but also nonlocal "mother" in (4) and "father" in (5) to be antecedents of jibun and owners of the skirt. This makes the sentence (5) "strange" pragmatically, while the sentence (4) is not, if the children have the marked setting for the GCP. Children with the unmarked setting, on the other hand, will find both sentences to be strange, because only the clausemate local elements, "father" in (4) and "Taroo" in (5) will be the only antecedents and it is pragmatically unlikely that they have the skirts.

2 four-year olds and 3 five-year olds thought that only the sentence in (5) was "strange." These subjects appear to have the "marked" setting. On the other hand, 1 three-year old, 2 four-year olds, and 2 five-year olds felt both sentences in (4) and (5) were "strange." When they were further asked what was "strange" with these sentences, they said they thought so because the sentence (4) meant that father had a skirt and the sentence (5) meant that Taroo had a skirt. This suggests that these subjects had the unmarked setting but that they had not changed it to the marked setting yet. 4 three-year olds, by the way, appeared unable to process these complex sentences. They did not respond to the task when these sentences were presented.

The number of subjects is too small to give any conclusive remarks and further study is called for, as admitted by Otsu, but the results in this study seem to support the developmental process predicted by the Subset Principle. The unmarked setting of the GCP is set sometime around 3 year old, while its marked setting appears to be acquired around 4, although there are still four- and five-year-old children with the unmarked setting. That is,

the initial setting is the "unmarked" and it is changed to the "marked" when exposed to positive evidence motivating such a shift.

2.3.1.1.2. Developmental Data for English L1

Read and Hare (1979) used a **toy-manipulation task to elicit** interpretations of reflexives in sentences like (6) below from 230 children aged **6;3 to 12;11.**

(6)   a. Ernie$_i$ was sorry Cookie Monster$_j$ hurt himself$_{i*/j}$.
        b. Cookie Monster$_i$ made Oscar; wash himself$_{i*/j}$.

In (6a), the reflexive is in a tensed clause, while it is found in a **tenseless,** infinitive clause in (6b). We call the first type **the "tensed" sentence** and the second the **"tenseless" sentence. Rea**d and Hare, **however, did not differentiate these** two **kinds** of **sentences in** their data analyses.

Children in this study showed **69-88** percent local **interpretation, the** unmarked **setting.**[20] That is, they picked "Cookie Monster" as **an antecedent** of "himself." Age **was** found not to be a significant factor, with 9 year olds achieving the highest score. **This** appears to **suggest that** the "unmarked value of **the GCP is set** before 6 in **English L1.**

Solan (1987) tested 37 younger children **aged 4 to 7 by using the toy-** manipulation task. Both tensed and tenseless sentences were used in **this** study, which are shown in 7.

(7)   a. The dog$_i$ said that the horse$_j$ hit himself$_{i*/j}$.
        b. The dog$_i$ told the horse$_j$ to hit himself$_{i*/j}$.

Subjects gave 92 percent unmarked, local interpretation (e.g. the horse) to the "tensed sentences, whereas the percentage was 76 percent for **the "tenseless"** sentences. The effect of **tensedness** was **significant.** This significant difference in interpretation between these **two** types of sentences may suggest a **need** to separate these in **interpreting** English data.

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[20] Read and Hare presented their results graphically and no raw scores and percents were given. The numbers cited here for this study are approximations based on Figure 6.1 (p. 108) in the paper.

Age again made no difference in the number of correct responses. The unmarked value of this parameter seems to have been set still earlier, that is, before 4.

Jakubowicz (1984) tested 28 even younger children aged 3 to 5 years old also by using the toy-manipulation task. The followings are the representative, sentences used in this study.

(8)   a.   John$_i$ said that Peter$_j$ washed himself$_{i*/j}$.
       b.   John; said that Peterj wanted himself$_{i*/j}$ to kick the ball.
       c.   John; said that Peter$_j$ put the ball next to himself$_{i*/j}$.

Note that these are the "tensed" sentences in Solan's study. It was found that children as young as 3 did not make errors in interpreting reflexives and interpreted "himself" as referring to the local NP "Peter" over 80 percent of the time.[21] Thus, English LI children have set the parameter to the "unmarked" value as early as 3. This again follows the prediction by the Subset Principle. In English, however, there is no positive evidence to motivate such a shift in parametric value from the unmarked to the marked as in Japanese LI.

Now that we have relatively clear idea as to what is known of the developmental process in parameter setting of the GCP in English and Japanese L1s, a review of a study which examined the final state of this parameter in these L1s will follow in the next section.

2.3.1.2. Final State Data of English LI and Japanese LI

Shimura and Yoshino (1988), which followed the elegant design of a smaller L2 pilot study by Finer and Broselow (1986), examined both the GCP and the PAP in English LI, Japanese Ll, and English L2 by Japanese learners. The sentences in (9a) and (10a) represent the "tensed" sentences used in this study, whereas (9b) and (10b) are the "tenseless" sentences.

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[21] Like Read and Hare, results in Jakubowicz were also presented graphically and no raw scores and percents were given. The numbers cited here are also approximations based on Figure 6.1 (p. 108) in the paper.

(9) a. Mr. Fat$_i$ thinks Mr. Thin$_j$ will paint himself$_{i*/j}$.
     b. Mr. Fat$_i$ **wants** Mr. Thin$_j$ to paint himself$_{i*/j}$.

(10) a. **Hutoccho-san$_i$ wa   Yaseccho-san$_j$ ga   jibun$_{i/j}$ o   nur-u**
         Mr. Fat   TOP Mr. Thin   N   self   A   paint-PRS

         to   **omoi-mas-u.**
         COMP   **think-POL-PRS.**

         'Mr. Fat *thinks* that Mr. Thin **will** paint self.'

     b. **Hutoccho-san$_i$ wa   Yaseccho-san$_j$ ni   jibun$_{i/j}$ o   nut-te**
         Mr. Fat   TOP Mr. Thin   D   self   A   paint-GER

         hosii   no   des-u.
         want   COMP   be-PRS

         '(It) is that Mr. Fat wants Mr. Thin painting self.'

A picture identification task in which **subjects are asked to show their interpretations** of reflexive **bindings** by choosing **pictures was used** to elicit **data** from 10 adult NSs of **English,** 10 adult NSs of Japanese, and 30 adult NSs **o**f Japanese learning **English** as a **second language (ESL). Though small** in scale, Shimura and **Yoshino's** study **used** the **same** two experimental designs as the present **thesis.** Tables 10 **and 11** show the **results** of **English** and **Japanese L1 data for the GCP in Shimura** and **Yoshino.**

Table 10. —— English LI Data for **the** Governing Category Parameter (from Shimura and **Yoshino** 1988)

	Local (%)	Non-local (%)	Both (%)
Tensed Sentence	80 (100.00)	0 (0.00)	0 (0.00)
Tenseless Sentence	80 (100.00)	0 (0.00)	0 (0.00)

Tensed Sentence: $\chi^2 = 159.98$, df=2, p < 0.05.
Tenseless Sentence: $\chi^2 = 159.98$, df=2, p < 0.05.

The GCP proposed in Wexler and Manzini projects the **unmarked "local" interpretation for English. English L1 data** in this study 'faithfully

followed this prediction. In both types of sentences for the GCP, all the native speakers (NSs) of English gave 100 percent "local" interpretation.

Unlike the English L1 data, the results for the Japanese L1 did not exactly follow the pattern of interpretation predicted by the GCP, that is, 100 percent "both" (see Table 11 below).

Table 11. —— Japanese LI Data for the Governing Category Parameter (from Shimura and Yoshino 1988)
4

	Local (%)	Non-local (%)	Both (%)
Tensed Sentence	14 (17.50)	6 (7.50)	60 (75.00)
Tenseless Sentence:	9 (11.25)	12 (20.00)	59 (73.75)

TensedSentence
    All: $\chi^2=63.69$, df=2, p < 0.05.
    Local x Non-local: $\chi^2=2.45$, df=1*, p > 0.05.
Tenseless Sentence
    All: $\chi^2=58.97$, df=2, p < 0.05.
    Local x Non-local: $\chi^2=0.19$, df=1*, p > 0.05.
*Since df= 1, corrected.

NSs of Japanese gave 75.00 percent "both" interpretation to the "tensed" sentences and 73.75 percent to the "tenseless." How can we explain this variation or deviation from theoretical prediction? Is the parameter proposed by Wexler and Manzini incorrect? Or, is there something wrong with the experimental task used in this study, the picture identification task?

Bley-Vroman et al. (1989), Felix (1988), Liceras (1989), Mazurkewich (1981), Ritchie (1978), Schachter (1989a, 1989b), Suciadi (1989), and White (1985a, 1987b, 1987c, 1988b, 1989a) used LI data as control in their L2 studies and reported similar variation or deviation from theoretical prediction among their L1 controls. Such discrepancies between the observed data and theoretical projection may possibly be explained by recalling the significant distinction between competence and performance.

The possible antecedents of Japanese reflexives are both local and non-local according to the GCP. The NSs of Japanese in Shimura and Yoshino gave the "both" interpretation more often than a chance for both kinds of sentences (75.00 percent for the "tensed" sentences and 73.75 percent for the

"tenseless" against the sheer chance of 33.33 percent). In fact, differences in totals are statistically significant in both cases (Tensed **Clause,** $\chi^2=63.69$, df=2, p < 0.05: **Tenseless Clause,** $\chi^2=58.97$, df=2, p < 0.05.). It might be safe to say then that the Japanese L1 setting is the marked "both," which is in accordance with the theoretical prediction by **Wexler** and **Manzini. The** proposed GCP is probably correct in Japanese L1 as well as in English L1.

The "both" interpretations, I repeat, are possible **in Japanese,** so it is still not wrong to give either local or non-local interpretations. This might be the reason why some of the NSs who were not very sensitive linguistically **gave** interpretations other than "both" in the "performance" task used in **Shimura** and **Yoshino,** while they did know that the "both" interpretations are possible at the "competence" level. **One** might conjecture that the detection of ambiguity is a particularly difficult task. **Hence,** the Japanese speakers, who had to discern "both" interpretations, were faced with a more difficult performance task than the native **English speakers** whose grammar allows only one possibility. It is harder to see two alternatives than to see the only possibility. Also, **when** two alternatives **must** be detected, it is likely that one will be easier to detect than the other. **This** calls for the distinction between competence **and performance** In interpreting these performance data throngh which competence, the psychological construct of interest to **us,** is investigated **(Eubank 1989a; Gregg 1989).** If the experimental task could somehow directly tap the competence of the NSs, results would have **shown** 100 percent predicted interpretation in L1 data. Performance through which we attempt to examine competence, however, is a result of interactions between LAD, **the** domain specific linguistic module, and non-linguistic **modules** in our mind. Possibly due to such non-linguistic factors as memory limitations and/or pragmatical effect, NSs' interpretation can vary and deviate from the theoretical prediction in performance.

Also, this suggests the importance of the **use** of L1 controls in our research. **Many** earlier studies have not employed **L1 control** data (for example, **Adjémian** and **Liceras** 1984; **duPlessis** et **al.** 1987; Finer and **Broselow** 1986; **Flynn 1983; Flynn** and **Espinal 1985;** Hilles 1986; **Ioup** and Kruse 1977; **Mazurkewich** 1988; **Phinney 1987;** White **1985b) and** interpreted their data based on an unwarranted **comparison** between performance in L2 and theoretical **and,** consequently, noise-less L1 competence.

Now look at Table 12 below for more detailed Japanese LI data (individual subjects **x** individual sentences).

Table 12. ── Japanese L1 Baseline Data ──Individual **Subjects x** Individual Sentences (from Shimura and Yoshino 1988)

		Governing Category Parameter																# of non-"both" interpretation out of 16 sentences
		Tensed Sentences								Tenseless Sentences								
Sentence	#	4	6	7	11	14	16	20	22	1	3	9	10	12	17	19	24	
Subject	1	L	L	L	B	B	B	B	B	B	L	B	N	B	N	B	L	9
	2	L	B	B	B	L	L	L	B	B	B	B	B	B	B	B	B	12
	3	N	B	B	B	N	B	B	B	L	B	B	B	B	N	N	B	11
	4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16
	5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B.	B	16
	6	L	L	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14
	7	L	B	L	L	B	L	B	L	L	L	L	B	L	B	L	L	5
	8	B ·	B	B	B	B	B	B	B	N	N	B	B	B	B	B	B	14
	9	B	B	B	B	B	N	B	B	B	N	B	N	B	B	B	N	12
	10	B	N	N	N	B	B	B	B	B	B	N	N	B	N	B	B	10

L(ocal), N(onlocal), B(oth)

If the data in the table are examined vertically, it can be found that most of the sentences here have been given **both** "local" and "non-local" interpretations, as "both" of the interpretations are possible in Japanese. Still, there is a tendency that "local" interpretation (17.5 percent) was given more than "non-local" (7.5 **percent)** with the tensed sentences, while the situation is reversed with the **"tenseless"** sentences (11.3 percent for "local" **and** 20.0 percent for, the "non-local" interpretation), although these differences were not significant (Tensed sentences, $\chi^2=2.45$, $df=1^*$, $p > 0.05$; **Tenseless** sentences, $\chi^2=0.19$, $df=1^*$, $p > 0.05$). The **above** tendency may **suggest** the possible use **in** performance of the **following** type of interpretation **strategy by** these **NSs:**

An Interpretation Strategy
When a sentence **is** ambiguous as to the interpretation of antecedent for an anaphora, choose **the** first relevant element in a tensed clause.

The interpretation of the above two **kinds** of sentences in Japanese is ambiguous according to the **GCP** at the competence level, but the **NSs** chose

the first relevant element, "local," within the embedded "tensed" clause in the tensed sentences, while they chose the first relevant element, "non-local," in the "tensed" matrix sentence in the tenseless sentences. When given an ambiguous sentence, the first relevant element is chosen, but it appears to be the first relevant element in a tensed clause. Hence, the possible use by the NSs in Shimura and Yoshino of the Interpretation Strategy above. This bias toward the first relevant element in a tensed clause influences the L1 performance data and possibly the L2 performance data of interest to us in the present thesis.

2.3.2. L1 data for the Proper Antecedent Parameter (PAP)
2.3.2.1.1. Developmental Data for Japanese L1

Otsu (1987b) presented the following juxtaposed sentences (11) and (12) to 3-, 4-, and 5-year old Japanese children, 5 subjects for each age group, and asked them to point out "strange" sentences, if any, and also to explain what was "strange."

(11) Okaasan wa otoosan ni jibun no sukaato o mise-mash-ita.
    Mother TOP Father D self G skirt A show-POL-PST.
    'Mother showed Father self's skirt.'
(12) Otoosan wa okaasan ni jibun no sukaato o mise-mash-ita.
    Father TOP Mother D self G skirt A show-POL-PST.
    'Father showed Mother self's skirt.'

According to the PAP, subjects, "mother" in (11) and "father" in (12), are the only proper antecedents of reflexives in Japanese. Since it is pragmatically "strange" for fathers to have skirts, sentence (11) should be preferred to (12), if the Japanese children have already set their PAP to the unmarked value, the setting for Japanese.

Except for 2 three-year olds and 1 four-year old, all the children preferred sentence (11). When those children who did not think that (12) was not strange were further asked who the skirts in the sentences belong to, their response for the sentence (11) was "mother" and the response of "father" was given to (12). Thus, even though these children did not respond to the task as expected, this shows that they did know that the antecedent of the reflexive is

the subject of the sentence. Thus, all these young children have already set the value of the PAP to the "unmarked by as early as 3.

2.3.2.1.2. Developmental Data for English L1

Read and Hare (1979) presented the following type of sentence (13) to 230 English L1 children aged 6;3 to 12;11.

(13)   Big Bird; told Oscar; a story about himself $_{i/j}$.

According to the PAP, both the subject "Big Bird" or the object "Oscar" are the possible antecedents of the reflexive "himself" in (13). Although the "both" interpretation is thus correct for English L1, the children were to choose between the subject and the object in Read and Hare's toy-manipulation task. It was reported that there was no preference for either interpretation with the youngest group (6;3 to 7;1), the group of 9-year olds, and the oldest group (11;10 to 12;11) choosing subject 44 percent, 56 percent, and 67 percent of the time, respectively. All these children appear to have already set the parameter to the "marked" value.

Jakubowicz (1984) looked at still younger children. Again, children were to choose between the subject and object interpretations in the toy manipulation task. When the children were presented with sentences like the ones in (14) below, three-year olds interpret the reflexives to be bound by the subjects about 25 percent of the time, while the percentage rises to 50 percent for the four-year olds and 75 percent for the five-year olds.

(14)   a. John$_i$ gave Peter$_j$ the picture of himself$_{i/j}$.
         b. John; told Peter$_j$ that the picture of himself$_{i/j}$ was on the table.
         c. [John and Peter]$_i$ put [Sue and Mary]$_j$ next to themselves$_{i/j}$.

This is a puzzling result. If the Subset Principle is correct, these child NSs of English should have started with the unmarked setting, which gives "subject" interpretation. As they encounter relevant positive evidence such as (14), they relax their setting to marked, which gives both "subject" and "object" interpretations. The predicted shift is from the dominant unmarked "subject" interpretation among the younger children to the marked setting,

producing both "subject" and "object" interpretations in a balanced distribution (50 percent for each) among the older children. Results here, however, show dominant "object" interpretation among the youngest 3-year olds, balanced interpretation among the 4-year olds, and dominant "subject" interpretation among the oldest 5-year olds. Figure 5 illustrates schematiclly the difference between the theoretical prediction and the results in Jakubowicz.
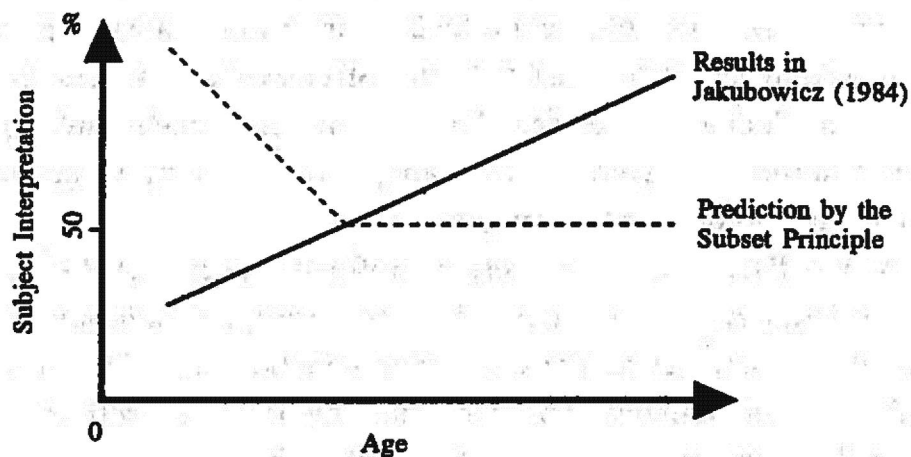
Figure 5 Prediction by the Subset Principle and
the Results in Jakubowicz (1984)

Possibly due to memory limitation, the 3-year olds in this study might have used such an interpretation strategy as the Minimal Distance Principle (MDP) (C. Chomsky, 1969), although we still cannot tell from the results which parameter setting the 3-year olds may have. C. Chomsky found that children used the Principle in the early stage of acquisition (before the age of 5;6) to determine the subjects of the complement verbs in both types of sentences below.

(15)   a. John told Bill to go.
        b. John promised Bill to go.

The MDP tells children that the implicit subject of the complement verb is the NP most closely preceding it. **This** gives a correct interpretation for (15a) but not for **(15b).** Children learn not to use this principle with **(15b)** later in the acquisition process (between the **ages** of 5;6 and 9;0). It is quite possible then that the younger subjects in Jakubowicz used such a principle in interpreting reflexives. **The** 3-year olds took the nearest NP, object, as the antecedent of the reflexive.

The strong preference for subjects as antecedents of reflexives among the 5-year olds in Jakubowicz, on the other hand, can be explained by **the** possible use by these older children of the Interpretation Strategy which **was** proposed in Section 2.3.1.2. for the GCP. This Strategy tells learners to choose the first relevant element in a tensed clause **when** a sentence is ambiguous as to the interpretation of antecedent for an anaphora. **The** first elements in the sentences **used** in Jakubowicz **(14)** are the subjects.

The above discussion on the possible influence of the MDP and the Interpretation Strategy on these **young** children once again suggests the importance of the **competence/performance** distinction in performance data analysis. Children in Jakubowicz probably had the parameter settings predicted by UG at the competence level. The PDP, however, overrides the competence in the performance of **very** young children like the 3-year olds in **this study, while** the Interpretation Strategy does so in **the** performance of older children aged five or older.

2.3.2.2. Final State Data for Japanese and English **L1s**

Tables 13 and 14 show the adult English and Japanese LI data for the PAP in **Shimura and Yoshino** (1988) in which sentences like the ones in (16) were used.

(16) a. Mr. Fat showed Mr. Thin a picture of himself.
      b. Hutoccho-san **wa**   **Yaseccho-san** ni jibun no shashin o
          Mr. Fat   **TOP** Mr. Thin   D   self G picture A
          mise-mash-ita.
          show-POL-PST.
          'Mr. Fat showed Mr. Thin self's picture.'

91.3 percent "subject" interpretation in the Japanese L1 data can be said to support the PAP, whereas the English L1 data (37.5 percent for "subject," 11.3 percent for "object," and 51.3 percent for "either") did not follow the 100 percent "both" interpretation predicted by Wexler and Manzini. Still, the "both" interpretation (51.3 percent) was chosen more than a chance of 33.33 percent. This interpretation was given significantly more than the "object" interpretation (11.3 percent), while it was not given significantly more than the "subject" interpretation (37.5 percent). I can be said, however, that there is a tendency that the "both" interpretation was preferred to the "subject" interpretation

Table 13.—— Proper Antecedent Parameter: Japanese and English LI Data (from Shimura and Yoshino 1988)

	Subject (%)		Object (%)		Both (%)	
Japanese L1	73	(91.3)	3	(3.8)	4	(5.0)
English L1	30	(37.5)	9	(11.3)	41	(51.3)

Japanese L1
　　　All: χ^2=120.76, df=2, p < 0.05.
English L1
　　　All: χ^2=19.83, df=2, p < 0.05.
　　　Both x Subject: χ^2=1.41, df=1*, p > 0.05.
　　　Both x Object: χ^2=19.22, df=1*, p < 0.05.
　　　Subject x Object: χ^2=10.26, df=1*, p < 0.05.
*Since df= 1, corrected.

and that the parameter setting of English L1 for the PAP is "both," which follows the prediction by the PAP for English.

Table 14 below, which shows more detailed English L1 data (individual subjects x individual sentence), suggests that this analysis is probably on the right track.

Once the subjects realized that the correct interpretation was "both," they consistently supplied such interpretations (subjects 1, 2, 3, 7, and 8). It seems that the interpretations other than "both" were given by particular

subjects (4, 5, 6, 9, and **10), while** there is little variation across **sentences.**[22] This again supports the proposed **parameter** setting for English L1.

Table **14. —— English L1 Baseline Data**
—— Individual Subjects **x** Individual
Sentences (from **Shimura and Yoshino 1988)**

Proper Antecedent Parameter

Sentence	#:	2	5	8	13	15	18	21	23	Eng/Jpn/Other
Subject	1	S	B	B	B	B	B	B	B	7/1/0
	2	S	B	B	B	B	B	B	B	7/1/0
	3	S	B	B	B	B	B	B	B	7/1/0
	4	S	S	S	S	O	S	O	S	0/6/2
	5	S	S	B	O	B	S	B	S	3/4/1
	6	S	S	S	S	O	S	O	S	0/6/2
	7	S	B	B	B	B	B	B	B	7/1/0
	8	S	B	B	B	B	B	O	B	6/1/1
	9	B	S	S	S	S	S	S	S	1/7/0
	10	S	O	B	B	O	B	O	S	3/2/3

S(ubject), O(bject), E(ither)
Eng/Jpn/Other: Numbers of English/Japanese/Other values
observed.

Since the "both" interpretation is correct, it is **still** not **wrong** to give either "subject" or "object" interpretations. Nevertheless, the "subject" interpretation was given **significantly** more often than the "object" interpretation (χ^2=10.26, df=1, $p < 0.05$). What does this differential interpretation suggest? Why is the "subject" interpretation preferred **significantly** more to the "object" interpretation, **while** "both" are **theoretically possible?**

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[22] Sentence 2 consistently received a "subject" interpretation. One might suspect that this sentence does not **belong here. This,** however, is not the case. For the purpose of obtaining the reliability of the measurement used **in** this study, each sentence was paired with a sentence whose subject and object **are** reversed. For instance,'the sentence.2 is "Mr. Thin *tells* . Mr. Fat a story about **himself,"** and it **was paired** with the sentence 23, "Mr. Fat tells Mr. Thin a story about himself." **The** only difference between them is that the subjects and **objects** are reversed. Now, if you look at the interpretation, sentence 23 is consistently given "either" interpretation by those subjects who realized that the appropriate interpretation is "either."

This question can be solved once again by applying the Interpretation Strategy discussed in Section 2.3.1.2. The strategy tells the language learners to choose the first relevant element in a tensed clause when a sentence is ambiguous as to the interpretation of antecedent for an anaphora. As discussed above, NSs of English in Shimura and Yoshino did have the marked "both" setting at the competence level. Since "both" the "subject" and the "object" interpretations are possible, experimental sentences like (16a) are ambiguous as to the Interpretation of reflexive binding. Thus, the NSs of English who were not linguistically sensitive picked the first relevant element in the ("tensed") sentence, namely the "subject," to be the antecedent of the reflexive in performance. Hence, the observed preference for the "subject" interpretation over the "object."

In this section, empirical data from previous studies investigating the GCP and the PAP in English and Japanese L1s were reviewed. Developmentally, setting of 'these parameters in both English and Japanese L1s seems to follow the process predicted by the Subset Principle. Both English and Japanese children learn the unmarked settings very early in their development. If positive evidence (hat motivates relaxing of the most restricted unmarked setting to the marked one is available, the parametric value is changed to the marked one. Such a parametric value shift will not result where the positive evidence is not available. Then, if the U-SPH, which predicts that L2 acquisition process is exactly the same as that of LI, is correct, the above developmental sequence may appear in the L2 data in the present study.

The U-TH and the FDH, on the other hand, both project that the L2 acquisition commences with the L1 setting. If so, the L2 learners start with the L1 final state and the interpretation bias discussed above. On interpreting the data in the present study, such effect of performance bias present in L1 at its final state should be taken into consideration. The L2 learners, if they are confronted with ambiguous sentences and if they are relatively naive linguistically, might transfer to the L2 the interpretation strategy, a bias toward the first possible alternative within a tensed clause.

Now that we have a better understanding of these two parameters in L1s, we can go on to discuss research hypotheses of the present study in the next section.

III. RESEARCH HYPOTHESES OF THE PRESENT STUDY

3.1. Research Hypothesis for the First Study

The first study uses the PAP. English is the marked LI and Japanese is the unmarked L2. The U-SPH will be systematically compared with the U-TH and the FDH. A research hypothesis for this first study will be described in this section.

3.1.1. The UG-Subset Principle Hypothesis (U-SPH)

The U-SPH projects that acquisition of the L2 parameter setting for the PAP will be easy and that such acquisition takes place from an early stage of SLA (Hl-a). The parameter setting of L2 learners, NSs of English, at the low proficiency level as well as at the mid and high proficiency levels is not different from that of the native speakers of the L2 being learned.

3.1.2. The UG-Transfer Hypothesis (U-TH) and the Fundamental Difference Hypothesis (FDH)

The U-TH and the FDH both predict difficulty in acquisition of the PAP in L2 and that the acquisition of this parameter might not happen until later stages of SLA development, if it happens at all (H1-b). The interpretation of JSL learners at all levels and those of the Japanese LI controls are predicted by these two hypotheses to be different.

3.1.3. The Research Hypothesis to be Tested in the First Study

Shimura and Yoshino (1988), although small in scale, used the same experimental design as the present thesis and tested the above two hypotheses by investigating the acquisitional process of the GCP by 30 NSs of Japanese learning English as a second language (ESL). Japanese is die marked L1 and English the unmarked L2 in the study.

Table 15 below summarizes the results in the first study of Shimura and Yoshino where the U-SPH was compared with the U-TH and the FDH.

Table 15. ——— Results from the First Study in Shimura
and Yoshino (1988) ——the Governing Category Parameter

	Local (%)	Nonlocal (%)	Both(%)
English L1	160 (100.00)	0 (0.00)	0 (0.00)
ESL	311 (64.79)	37 (7.71)	132 (27.50)
JapaneseLI	23 (14.38)	18 (11.25)	119 (74.38)

English L1, RSL, JapaneseL1 x Local, Nonlocal, Both:
χ^2=259.50, df=4, p<0.05.
English L1, ESL x Local, Nonlocal, Both: χ^2=76.54, df=2, p<0.05.
ESL, Japanese L1 x Local, Nonlocal, Both: χ^2=129.27, df=2, p<0.05.

The ESL group was significantly different from both English L1 and
Japanese L1 groups (χ^2=76.54, df=2, p<0.05 and χ^2=129.27, df=2, p<0.05,
respectively). The hypothesis, based on the U-SPH, that the interpretation by
the Japanese ESL learners at alllevels and that by the English LI are the same
was rejected. The research hypothesis based on the U-TH and the FDH was
instead supported. The interpretation by the Japanese ESL learners is
significantly different from that by the native English speakers. 27.5 percent
of the interpretation is the "both" interpretation, which is the L1 value.
Transfer of L I value can be seen.

Notice that the distinction between the "tensed" and "tenseless"
sentences was not made in this cross-linguistic comparison, although such
contrast was suggested to be maintained in the analyses of the previous L1
studies (Solan 1987 for English LI; Shimura and Yoshino 1988 for Japanese
I1).

The following are representative of the sentences in Shimura and
Yoshino.

(17) a. Hutoccho-san wa   Yaseccho-san ga jibun o nur-u
          Mr.Fat   TOP Mr.Thin   N   self   A Paint-PRS

          to   omoi-mas-u.
          COMP   think-POL-PRS
          'Mr. Fat thinks that Mr. Thin paint self.'
      b. Mr. Fat thinks that Mr. Thin will paint himself.

(18) a. **Hutoccho-san** wa **Yaseccho-san** ni jibun o nu-tte
Mr.Fat   T O P **Mr.Thin**   D self   A paint-GER

hoshii no   **des-u.**
want   **COMP**   be-PRS

'(It) is that Mr. **Fat** wants Mr. Thin painting self.'

b. Mr. Fat **wants** Mr. Thin to paint himself.

The sentence in (17b) contains **a reflexive** pronoun in a tensed clause, and **this** type of sentence was called a "tensed" sentence. **The** reflexive in **the** sentence in (18b) is in the **tenseless** infinitive clause, and this type **of** sentence **was** called a **"tenseless"** sentence. These two types of sentences were tested both in a L1 developmental study (**Solan** 1987) and in ESL studies (Finer **and** Broselow 1986; **Hirakawa** 1989). As discussed in a review of **Solan's study** in Section 2.3.1.1.2., the effect of **tensedness** on the interpretation of reflexive **binding** was significant, and reflexives in **these** two types of **sentences** were interpreted differently in **English** LI. The **same** difference **was** also reported in **the** above L2 studies for **English** L2. Then, it was suggested that they should **be** treated separately in **English.**

The Japanese sentences in **(17a)** and (18a) also **have** the same difference. While **"jibun"** is contained in the tensed clause in **(17a),** the Japanese reflexive pronoun is in a clause without any tense marker in **(18a).** LI Japanese results in **Shimura** and **Yoshino** showed a significant effect of tense. Therefore, it would have been desirable to treat these two types of Japanese sentences, the "tensed" sentences and the **"tenseless"** sentences, separately in the study.

However, the Japanese correspondents of verbs, **such** as **"ask"** and "tell," that take infinitives in English do not necessarily have the same **"tenseless"** sentence structure **in Japanese,** as is clear from the examples in (19) and (20).

(19) a. Mr. Fat asks Mr. **Thin** to paint himself.

b. Hutoccho-san wa **Yaseccho-san** ni jibun o . **nur-u**
Mr. Fat   **TOP** Mr. Thin   D **self** A **paint-PRS**

yoo   **tanomi-mash-**ita.
COMP   **ask-POL-PST**

'**Mr.** Fat asks that Mr. Thin paint himself.'

(20) a. Mr. Fat tells Mr. Thin to paint himself.

  b. Hutoccho-san wa Yaseccho-san ni jibun o nur-u
   Mr. Fat   TOP Mr. Thin   D self A paint-PRS
   yoo   ii-mash-ita.
   COMP   tell-POL-PST
   'Mr. Pat tells that Mr. Thin paint himself.'

Consequently, these two languages are not really comparable and such differential treatment was not maintained in cross-linguistic comparison. For the same reason, these two types of sentences will be combined for analyses in the present thesis. Note, however, that, when these two languages are analyzed separately, the distinction can be made and should be observed.

Hirakawa (1989) also studied the acquisition of the GCP by 65 Japanese ESL learners. These subjects were students in grades 10 through 13 In Japan. Hirakawa used a multiple-choice antecedent identification task in which subjects were given an experimental sentence with a reflexive pronoun in it and they were asked to indicate its antecedent by choosing one of the choices given below the sentence. The subjects' L2 performance was compared with L1 performance of 20 NSs of English and 22 NSs of Japanese. Thus, this study basically has the same experimental design as Shimura and Yoshino, although it was not intended to test the two hypotheses (H1-a and Hl-b). Table 16 below summarizes the results in the study.

Table 16. —— Results on the Governing Category Parameter in Hirakawa (1989)

	Local (%)		Nonlocal (%)		Both(%)	
English L1	197	(98.50)	3	(1.50)	0	(0.00)
ESL	424	(66.25)	172	(26.88)	44	(6.88)
Japanese L1	50	(43.10)	44	(37.93)	22	(18.97)

English L1, ESL, Japanese L1 x Local, Nonlocal, Both:
  χ^2=269.26, df=4, p<0.05.
English L1, ESL x Local, Nonlocal, Both: χ^2=82.30, df=2, p<0.05.
ESL, Japanese L1 x Local, Nonlocal, Both; χ^2=129.06, df=2, p<0.05.

As in Shimura and Yoshino, the ESL group performed significantly differently from both English and Japanese L1 groups (χ^2=82.30, df=2, p<0.05

and $\chi^2=129.06$, df=2, p<0.05, respectively).[23] The hypothesis, based on the U-TH and the FDH, that the interpretation by the Japanese learners of ESL is significantly different from **that** by the native English speakers (H1-b) **was** also supported by the data in this study. The **6.88 percent** "both" interpretation given by the ESL group suggests transfer of L1 parameter setting and the hypothesis based on the U-SPH (H1-a) can be rejected.

Thomas (1989) also used the multiple-choice antecedent identification task to examine the GCP in English L2. 97 low-intermediate to advanced learners of English from 20 different countries and 4 bilinguals participated in (he study. 29 NSs of Spanish and **24 NSs** of Chinese constituted the two major groups among the experimental subjects. With respect to the GCP, Thomas assumed that Spanish has the same "unmarked" value as English, while Chinese like Japanese has the "marked" setting. The L2 learners' performance **was** compared with that of **11 NSs** of English. Unlike the previous **two** studies above, no comparison was made between subjects' L1 and ESL. Also, this study was not intended to test the two hypotheses (H1-a and H1-b).Table 17 summarizes a comparison between the English L1 and the Chinese ESL groups.

Table 17. —— Results on the Governing Category
Parameter in Thomas (1989)

	Local (%)	Nonlocal (%)	Both (%)
English L1	99.27	0.64	0.18
ESL (Chinese)	69.04	7.29	23.64

Since Thomas did not make this particular comparison statistically and no raw scores were reported in the study, English L1 and ESL by NSs of Chinese could not be compared statistically here. Chinese leamers' performance, however, appears to be different from that of English native speakers and **very** closely resembles the performance of Shimura and Yoshino's subjects. A 69.04 percent "local" interpretation was **given** by **the**

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[23] Hirakawa did not make these particular comparisons statistically. The statistical analyses reported here were performed using the raw scores reported by Hirakawa.

ESL learners as opposed to 99.27 percent by NSs. This difference seems to support the hypothesis based on the U-TH and the FDH (Hl-b). *On* the other hand, the 23.64 percent "either" interpretation given by the Chinese learners suggests possible transfer of L1 parameter value. The hypothesis based on the U-SPH (H1-a) may be rejected.

Thus, results from Shimura and Yoshino, Hirakawa, and Thomas all supported the U-TH and the FDH over the U-SPH and motivate the prediction based on the former to be tested in the present study. The research hypothesis (RH) in the first study then is:

> The interpretation by the learners of Japanese as a second language (JSL) at all proficiency levels is different from that by the Japanese L1 control. (RH1)

3.2. Research Hypotheses for the Second Study

The second study examines parameter setting of the GCP to compare the U-SPH and U-TH with the FDH. English is the unmarked L1 and Japanese is the marked L2. Two sets of research hypotheses to be tested in the second study will follow.

3.2.1. The First Set of Research Hypotheses based on the UG-Subset Principle Hypothesis (U-SPH) and the UG-Transfer Hypothesis (U-TH)

The U-SPH and the U-TH both predict that acquisition of the L2 setting in the GCP is relatively easy and early because they project a shift from the unmarked to the marked settings, which requires only positive evidence. The parameter setting of L2 learners at proficiency levels of low and middle, and, definitely, of high will be the same as that of the native speakers of Japanese. (H2-a-i)

Still, the predicted shift from the unmarked setting to the marked does require evidence. The number of learners successfully acquiring this L2 parameter setting may positively correlate with the quantity and/or quality of the input. This demands collection of such data as (1) the length of exposure to the L2 in total (LET), (2) the length of exposure to L2 in the classroom setting (LEC), and (3) the length of stay in the country where the L2 is spoken (LOS) as indices of quantity and quality of input. These two hypotheses then

further predict that subjects' performance in the second study positively correlate with LET, LEC, and LOS (H2-a-ii).

3.2.2. The Second Set of Research Hypotheses based on the Fundamental Difference Hypothesis (FDH)

According to the FDH, the L2 learners start with the L l setting, but, since UG is no longer available in its entirety and the parameter setting is not constrained by UG, problem-solving as the Learning Procedure leads the learners to settings not predicted by UG. To attain the target L2 setting will be difficult and will take time. The parameter setting of L2 learners at all proficiency levels will be different from that of the NSs of Japanese. (H2-b-i) The same hypothesis further predicts that L2 subjects' performance should not positively correlate with the indices of quantity and quality of input in L2 above. (H2-b-ii)

3.2.3. The Research Hypotheses to be Tested In the Second Study'

Shimura and Yoshino tested the first hypotheses (H2-a-1 and H2-b-1) in the above two sets of research hypotheses by investigating the acquisitional process of the PAP by 30 Japanese ESL learners. Japanese was the unmarked L l and English the marked L2.

Table 18 below summarizes the results in the second study of Shimura and Yoshino where the U-SPH and U-TH were compared with the FDH.

Table 18. —— Results from the Second Study in Shimura and Yoshino(1988) ——The Proper Antecedent Parameter

	Subject (%)		Object (%)		Both (%)	
English LI	30	(37.50)	9	(11.25)	41	(51.25)
ESL	163	(67.92)	26	(10.83)	51	(21.25)
Japanese Ll	73	(91.25)	3	(3.75)	4	(5.00)

English L1, ESL (Told), Japanese LI x Local, Nonlocal, Both:
$\chi^2 = 58.59$, df=4, p<0.05.
English L1, ESL (Total) x Local, Nonlocal, Both: $\chi^2 = 27.99$, df=2, p<0.05.
ESL (Total), Japanese L1 x Local, Nonlocal, Both: $\chi^2 = 16.96$, df=2, p<0.05.

The L2 learner **group is significantly different both from the English L1 group (χ^2=27.99, df=2,** p<0.05) and from the JapaneseL l **group (χ^2=16.96, df=2, p<0.05). The** U-SPH and the **U-TH** hypothesize that interpretations of the Japanese learners of ESL and those of **English** L l are the same **and** that they **both** choose the "both" interpretation, **while** the **FDH** predicts that the interpretation by the L2 learners **will** be **significantly** different from that by the native speakers. The results in Shimura and Yoshino appear to reject the U-SPH and **the U-TH** and to support the FDH.

Hirakawa also looked at acquisition **of the** PAP by **Japanese ESL learners. Da**ta from this study are summarized in Table 19.

Unlike the results in **Shimura** and Yoshino, **the ESL group in this** study was not significantly **different** from **the English** LI group (χ^2=5.10, df=2, p>0.05), while there was a significant difference between **the** L2 group **and the** Japanese L l group **(χ^2=23.95,** df=2, p<0.05). This supports the hypothesis based on the **U-SPH** and **the U-TH.**

Table 19. —— Results on the Proper Antecedent Parameter in Hirakawa (1989)

	Subject (%)		Object (%)		Both (%)	
English L1	67	(67.00)	21	(21.00)	12	(12.00)
ESL	240	(73.85)	66	(20.31)	18	(5.54)
Japanese L1	105	(95.45)	2	(1.82)	3	(2.73)

English L1, ESL (Total), Japanese L1 x Local, Nonlocal, Both:
χ^2=32.65, df=4, p<0.05.
English L1, ESL (Total) x Local, Nonlocal, Both: χ^2=5.10, df=2, p>0.05.
ESL (Total), JapaneseL l x Local, Nonlocal, Both. χ^2=23.95, df=2, p<0.05.

Table 20 below presents results of a comparison made **between English L1 and Chinese ESL groups in Thomas. She also looke**d at acquisition **of** the **PAP by ESL learners.**

Thomas did **not compare these groups statistically and raw scores were** not provided in **the** study, so statistical comparison cannot be made here. **Results** in this **study,** however, appear to **He somewhere between** those **of Shimura** and **Yoshino which** showed a significant difference between the

Table 20. — Results on the Proper Antecedent Parameter
in Thomas (1989)

	Subject (%)	Object (%)	Both (%)
English Ll	72.82	2.54	24.73
ESL (Chinese)	59.71	11.83	28.58

English LI and Japanese ESL groups and Hirakawa where these groups were
shown to be similar. The two groups in Thomas appear to be similar in terms
of the "both" interpretation (24.73 percent by English L1 and 28.58 percent by
ESL). NSs of English, however, gave more "subject" interpretation than the
ESL group (72.82 percent by English LI and 59.71 percent by ESL), while the
"object" interpretation was given more by the L2 learners (11.83 percent by
ESL and 2.54 percent by English Ll).

White (1989a) studied the adjacency condition on case assignment in
ESL by NSs of French and French as a second language (FSL) by NSs of
English. With regard to this principle, English is the "unmarked" language
and French is the "marked." Then, the FSL case in this study has the same
design as the second study in this thesis. A paced grammatical judgment (GJ)
and a multiple-choice GJ were used to elicit the FSL data and to compare FSL
learners' performance with that of NSs of French. There were three
experimental groups; the partial immersion group, the total immersion
group, and the submersion group. They differed in terms of the amount of
exposure to the L2 French with the submersion group receiving the most and
the partial immersion group the least.

In both the paced GJ and the multiple-choice GJ, all experimental
groups were found to be significantly different from the control groups.
White noted that "these learners are not fully taking into account the
presence of positive data in French..., and this includes the group with
presumably the most exposure to French, namely the submersion group" (p.
150). This seem to support the hypothesis based on the FDH as in Shimura
and Yoshino.

In summary, Shimura and Yoshino and White supported the FDH
over the U-SPH and the U-TH, but Hirakawa supported the latter over the
former, while the results in Thomas are compatible with both. Therefore, in

the second study of the present thesis, two sets of research hypotheses will be tested. The first set based on the U-SPH and the U-TH includes the following two hypotheses:

> The acquisition of L2 setting in the Governing Category Parameter is relatively easy and early. The parameter setting of L2 learners at proficiency levels of low and middle, and, definitely, of high is the same as that of the native speakers of Japanese. (RH2-a-i)

> L2 learners' performance in the second study positively correlate with (1) the length of exposure to JSL in total (LET), (2) the length of exposure to JSL in a classroom setting (LEC), and (3) length of stay in Japan where the target language is spoken (LOS), indices of quantity and quality of input. (RH2-a-ii)

The following two hypotheses are in the second set of research hypotheses based on the FDH:

> The parameter setting of L2 learners at all proficiency levels is differant from that of the native speakers of Japanese.(RH2-b-i)

> L2 learners' performance in the second study does not positively correlate with (1) the length of exposure to JSL in total (LET), (2) the length of exposure to JSL in the classroom setting (LEC), and (3) the length of stay in Japan where the target language is spoken (LOS), indices of quantity and quality of input. (RH2-b-ii)

In the next chapter, these research hypotheses of the present study will be tested in *two* studies with *two* specific experimental designs to answer the research question of the present study: which of the three competing hypotheses best explains the SLA process, the U-SPH, the U-TH, or the FDH? An alpha level of 0.05 will be used in all hypothesis testing.

CHAPTER III
THE FIRST AND SECOND STUDIES

To answer the research question of the present study and contribute to the solution of the tri-lemma in SLA, the research hypotheses discussed in the last section of Chapter II will be tested in the following two studies where the U-SPH, the U-TH, and the FDH are systematically compared; Because both studies involve the same subjects, NSs of English learning Japanese as a second language (JSL), and also because data for both studies are collected at the same time by using the picture identification task, discussions of subjects, materials, and procedures for both studies are combined in the Method section. Results for these two studies, however, are discussed separately.,

I. METHOD
1.1. Subjects

Table 21 summarizes 48 subjects in the experimental group who participated in the study.

Table 21 Summary of Subjects in the Experimental Group

Level	Sex M	F	Age at the Time of Experiment X̄	SD	Min	Max	Age when L2 Learning was Started X̄	SD	Min	Max
Low	16	0	31.64	7.25	21.16	45.92	25.46	6.13	18.75	39.00
Mid	12	4	29.04	6.83	19.33	38.58	21.01	4.03	15.00	28.75
High	13	3	34.97	11.28	19.75	54.75	22.65	6.40	13.42	39.00

As was discussed in Chapter I, it is important to have multiple experimental groups with different proficiency levels to investigate the developmental process in the setting of the parameters in question. A CLOZE test was given in order to divide the experimental group into subgroups in terms of subjects' global proficiency in JSL.[24]

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[24] Aitken (1977), Oller (1972, 1973, 1978), and Stubbs and Tucker (1974) claim that CLOZE test is an integrative test and useful for measuring of global skills.

The test was also used to ensure consistency in evaluating proficiency levels of subjects who participated from several different JSL programs. In the second study where the UG-based hypotheses, the U-SPH and the U-TH, are compared with the FDH, all (he three hypotheses predict a shift in parametric value from the L1 "unmarked" to the L2 "marked" settings. According the UG-based hypotheses, however, successful acquisition of the L2 setting requires relevant positive evidence. Therefore, it was decided that JSL learners in Japan or those learners of JSL who have spent extensive time in Japan, where the learners' L2 is spoken and the positive evidence is readily available, be subjects in the present study rather than those L2 learners who have studied JSL only in America. It was extremely difficult to find such subjects for this study, and data had to be collected from several sources.

Twenty-five minutes were given to the subjects for the completion of the CLOZE test which formed the second part of the four-part experimental packet the subjects worked on. The test was then scored both by exact-answer and acceptable-answer methods. The results are shown in Table 22.

Table 22 Results of CLOZE Test for the Experimental Group

Level	Exact Answers				Acceptable Answers			
	$\bar{X}$	SD	Min	Max	$\bar{X}$	SD	Min	Max
Low	14.19	3.58	8.00	19.00	20.75	4.37	10.00	27.00
Mid	23.50	1.75	20.00	26.00	33.44	3.71	28.00	40.00
High	32.25	3.32	27.00	38.00	45.00	2.56	40.00	49.00
All	23.31	8.01	8.00	38.00	33.06	10.62	10.00	49.00

The two sets of CLOZE scores correlated with each other at $r = 0.97$. Distribution of scores derived from the exact answers (k=50, $\bar{X}$=23.31, SD=8.01) seems to be better centered and this scoring also spread subjects out as well as the acceptable-answer scoring (k=50, $\bar{X}$=33.06, SD=10.62). Since the purpose of using a CLOZE test was to measure the global proficiency levels of the subjects and assign them to three qualitatively different proficiency level groups, the scores obtained through the exact-answer scoring were used.

The difference in CLOZE scores between the three groups was analyzed by one-way ANOVA and found to be statistically significant (F=145.61,

$df=2/45$, $p<.05$) with post hoc Scheffé's tests showing that the three groups form three significantly different subgroups. Notice that the standard deviations (SDs) for the three proficiency groups were relatively small (3.58 for the Low group, 1.75 for the Mid, and 3.32 for the High) in comparison to that of the experimental group as a whole (8.01), which indicates that the subgroups are more homogeneous than the {he whole group.

The Kuder-Richardson formula 21 (K-R21) was used to calculate the reliability of the CLOZE test, and a reliability coefficient of 0.82 was obtained. This means 'that the internal consistency reliability of the CLOZE test used in this study was 82 percent. Since no established norm-referenced tests like the Test of English as a Foreign Language (TOEFL) for English as a second language (ESL) are available for JSL, the criterion-related validity of the CLOZE test was not obtained.

The subjects were divided into three proficiency groups, the Low, Mid, and High groups, with 16 subjects in each. There were 16 males but no females in the Low group. At the time of experiment, the average age was 31.64 with SD of 7.25. There were 12 males and 4 females in the Mid group, who were 29.04 years old on average (SD=6.83). The High group was made up of 13 males and 3 females whose average age was 34.97. These three groups were not significantly different from each other in terms of the age at the time of experiment (F=1.874, df= 2/45, $p>0.05$).

As for the age when these learners started to learn Japanese, the earliest one in the whole experimental group was '13.42. It can be concluded that all these subjects started to learn Japanese after puberty and that they were all considered to be post-puberty adult L2 learners. The three groups were again not different from each other in terms of the age when the subjects started to learn Japanese (F=2.57, df=2/45, $p>0.05$).

In chapter I, it was argued to be necessary to obtain information on the quantity and quality of input the L2 learners get. In the first part of the four-part experimental packet the subjects worked on, biographical data as follows were elicited as indices of the quantity and/or quality of input: (1) the length of exposure to the L2 in total (LET), (2) the length of exposure to the L2 in the classroom setting (LEC), and (3) the length of stay in the country where the L2 is spoken (LOS). Tables 23 and 24 summarize these biographical data.

These categories all represent "length" of L2 exposure. They may be first regarded as indices of input quantity. Let us first discuss the differences in input quantity between the three experimental groups.

Table 23 Summary of Bio-data for the Experimental Group (1)

Level	LET[a]				LEC[b]			
	$\overline{X}$	SD	Min	Max	$\overline{X}$	SD	Min	Max
Low	3.71	2.29	0.67	8.67	1.23	1.23	0.00	4.16
Mid	5.26	3.44	2.00	13.92	2.47	1.39	0.25	5.00
High	10.86	8.97	1.75	34.75	1.94	1.86	0.00	6.00

a. Length of Exposure to the L2 in Total.
b. Length of Exposure to the L2 in Classroom setting.

Table 24. ——— Summary of Bio-data for the Experimental Group (2)

LOS[c]			
$\overline{X}$	SD	Min	Max
2.70	2.61	0.42	9.08
4.05	4.91	0.25	14.75
5.94	5.50	0.75	19.00

c. Length of the stay in a country where the L2 is spoken.

Total length of exposure to Japanese as a second language (LET) increased as the proficiency level went higher (3.71 years for the Low group, 5.26 for the Mid, and 10.86 for the High).   The;three groups significantly differed from each other (F=6.96, df=2/45, p<0.05). Post hoc comparisons showed that the Low and Mid groups comprised a subgroup and that the High group formed another.

The length of exposure to Japanese in a classroom setting (LEC) did not increase in proportion to the increase in proficiency (1.23 years of formal

study for the Low group, 2.47 for the Mid, and 1.94 for the High). In fact, these groups were not significantly different from each other with respect to this index of quantity of input ($F=2.67$, $df=2/45$, $p>0.05$).

The more proficient the learners were, the longer they tend to have spent in Japan (2.70 years for the Low group, 4.05 for the Mid, and 5.94 for the High). The difference, however, was not significant ($F=2.08$, $df=2/45$, $p>0.05$).

The three groups thus differed significantly only in terms of LET. How about the difference in terms of quality of input? Which of the above three categories can also be regarded as indices of input quality?

The CLOZE test was considered to be a measurement of global skill in L2. Then, the degree of correlation with scores on this test may show how much the three categories represent quality of input. Table 25 is a correlation matrix showing degrees of correlation between the CLOZE scores and LET, LES, and LOS.

Table 25. — Correlation Matrix (CLOZE
Scores x LET x LES x LOS)

	CLOZE	LET	LES	LOS
CLOZE	1.00			
LET	0.42	1.00		
LES	0.19	-0.08	1.00	
LOS	0.33	0.42	-0.34	1.00

The highest degree of correlation was found between CLOZE and LET, but the correlation was weak ($r=0.42$) and the coefficient of determination (r^2) was only 0.18. LOS was correlated with the CLOZE scores at r of 0.33 (coefficient of determination (r^2) $=0.11$), while LES was least correlated with the scores ($r=0.19$, $r^2=0.04$). LET appears to be the best index of quality as well as quantity of input among the three categories. Since the three experimental groups were found to be significantly different with regard to this category as an index of input quantity, it can be concluded that these groups are receiving different quantity and quality of input.

Besides these experimental subjects, NSs of Japanese and English also participated as control groups. 16 undergraduate students majoring in

English literature and linguistics at a college in Tokyo, Japan, comprised the Japanese L1 control group. They were all from the Tokyo area and speak standard Japanese. Since English is one of the mandatory subjects in Japan from the 7th grade (at 12 years old), they also had at least six years of exposure to English. The English L1 control group was made of 16 university students, both undergraduate and graduate, who were enrolled in an introductory course in English grammar at a university in Hawai'i. They had not been taught about the two parameters in question in this study at the time of experiment. All of these NSs of English reported that they speak General American English.[25]

1.2. Materials

The experimental packet JSL subjects were asked to work on is made of four parts: (1) a questionnaire eliciting biographical data from subjects, (2) a JSL CLOZE test, (3) a list of vocabulary used in this study, and (4) the picture identification task. Japanese and English L1 control groups, on the other hand, worked only on (1) and (4) in (heir first languages.

Part (1) was already discussed in the previous section, so parts (2), (3), and (4) as well as the experimental sentences used in this study will be described in detail in this section.

1.2.1. CLOZE test

As discussed in the Subjects section of this chapter, a CLOZE test was given to divide L2 learners into three proficiency groups. As far as this author knows, a CLOZE test in Shin (1987) is the, only standardized one for use in JSL. This test, however, is intended as a noun-referenced test only for the highly advanced learners of JSL. A new CLOZE test had to be developed to evaluate our subjects with a wide range of proficiency. A sample of this newly developed CLOZE test is found in Appendix D.

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[25] Although English L1 data were also elicited from seven speakers of Hawai'i Creole English in the same course, their data were excluded from the data base for the present study. These data, however, will be used to see if there is any dialectal differences in the parameter setting in a future study.

A passage in an elementary school reader for the third graders (Ootaki 1988) was adopted for use in this CLOZE test. The text was 432 words long with every seventh word missing (k=50), although first and last two sentences were left intact to give context.[26] Japanese does not use the Roman alphabet for writing. Instead, its **own** writing **system** *(a mixture of kana* and *kanji)* is used, so it is quite likely that there are some subjects who may not be able to read Japanese while they have oral proficiency in Japanese. The reading of the text **was,** therefore, also given in the Roman alphabet.

There are **two** ways to score **the CLOZE tests,** the exact-answer scoring and the **acceptable-answer** scoring. The former is done by giving points only to those answers that are exactly the same as the missing words in the original text, while the latter gives points not only to exact answers but also to words which are syntactically and semantically acceptable in the context where the words are used.

A list of acceptable answers can be made by administering CLOZE tests to NSs and recording their answers. Out CLOZE test was administered to 30 NSs of Japanese and such a list was compiled out of their answers. These NSs were undergraduate college students majoring in Japanese literature at a college in Tokyo, Japan. Their average score was 36.64 (SD = 0.75) according to the exact-answer scoring and 47.72 (SD = 0.72) according to the acceptable-answer scoring. Based on the answers given by these NSs, lists of exact and acceptable answers were compiled by the author. All of the acceptable answers

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[26] An attempt **was** made to apply the readability formula of Flesch (1948) to the Japanese text. The formula yields a score which ranges between 0 (practically unreadable) to 100 **(easy** for any literate person). The Flesch formula, applied to the Japanese *text,* yielded a score of -8.46. This **negative** value for a third grade text suggests that this formula, constructed on the basis of English **texts,** cannot be applied to Japanese. The following is the formula:

$$RE \text{ ("reading ease")} = 206.835 - 0.846 \times wl - 1.015 \times sl$$

where wl is the average number of syllables per 100 words and sl is the average number of words per sentence. The averages of wl and sl for the English texts used in Flesch (passages from McCall and **Crabbs (1926))** are 134.22 and **16.52,** respectively, **while** those for the random samples from the Japanese third **grade** reader are 238.37 and 13.44. Thus, sls are about the same, but wl in Japanese is 77.60% higher than that in English and this difference makes the second variable in the formula *(wl)* too large. Another useful readability formula can be found in Fry(1968). This formula, however, cannot be used for Japanese either, because it is also based on **(1)** the **average** number of syllables per 100 words (wl in Flesch) and (2) the average number of sentences per 100 words. Also, as far as the author knows, there is no readability formula developed especially for Japanese.

in the list were then reviewed by three independent NSs of Japanese——
teachers of JSL —for their appropriateness; 100 percent agreement was
achieved among them before the **list** was used to score the answers of our
subjects.[27]

1.2.2. List of Vocabulary

A list of words used in the experimental sentences was given to
subjects (See Appendix D). English equivalents of these words were also
given on {he same sheet. The subjects were given two minutes to review
them and check the ones that they did not know at that time. This list was
presented this way for the following two reasons.

First, we wanted to make sure that all the subjects knew all the words
in the experiment so that they would appropriately carry out the picture
identification task, discussed in more detail below. Subjects can probably
figure out meanings of all the words in the experiment due to the nature of
the task, that is, (he presence of pictures describing possible meanings of
sentences. Nevertheless, by giving the subjects the words in advance, we
eliminated the need of subjects to guess at word meanings. Table 26 shows
the words in this list as well as the number and percentage of subjects who
reported that they had not known these words before. Note that, while a few
subjects did not know "**paint**" and "expect," most words were familiar to the
subjects.

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[27] More detailed analysis of this CLOZE test, however, should be done to improve and
standardize it for future uses in SLA studies in JSL. Such an analysis, however, is beyond
the scope of the present study, and it will be done by the author in a future study.

Table 26. ⸺ Words in the Experimental Sentences and the Number and Percentage of Subjects Who Reported That They Had Not Known These Words

Japanese	English	Low #	(%)	Mid #	(%)	High #	(%)
jibun	(him)self	1	(6.25)	0	(0.00)	0	(0.00)
nurimasu	to paint	10	(62.50)	3	(18.75)	1	(6.25)
omoimasu	to think	0	(0.00)	0	(0.00)	0	(0.00)
iimasu	to say	0	(0.00)	0	(0.00)	0	(0.00)
shitte imasu	to know	0	(0.00)	0	(0.00)	0	(0.00)
kitaishimasu	to expect	12	(75.00)	6	(50.00)	1	(6.25)
tanomimasu	to ask	2	(12.50)	0	(0.00)	0	(0.00)
hoshii no desu	to want to	0	(0.00)	0	(0.00)	0	(0.00)
shashin	photograph	0	(0.00)	0	(0.00)	0	(0.00)
misemasu	to show	0	(0.00)	0	(0.00)	0	(0.00)
agemasu	to give	0	(0.00)	0	(0.00)	0	(0.00)
shitumon	question	0	(0.00)	0	(0.00)	0	(0.00)
hangshi	story	0	(0.00)	0	(0.00)	0	(0.00)
mottekimasu	to bring	0	(0.00)	0	(0.00)	0	(0.00)
yomimasu	to read	0	(0.00)	0	(0.00)	0	(0.00)
uta	song	0	(0.00)	0	(0.00)	0	(0.00)
utaimasu	to sing	0	(0.00)	0	(0.00)	0	(0.00)

Second, the Japanese word "jibun" can be not only a reflexive but also a pronoun referring to the first person speaker and the second person hearer. Sentences in (21) illustrate this.

(21) A: Kinoo   Masao o Michiko ni jibun no ie   de
        Yesterday Masao A Michiko D   you   G   house L

        shookaishi-mash-ita ka.
        introduce-POL-PST   Q

        'Did (you) introduce Masao to Michiko in your house yesterday?'

     B: Hai, Kinoo   Masao o Michiko ni jibun no ie   de
        Yes   Yesterday Masao A Michiko D I   G   house L

        shookaishi-mash-ita.
        introduce-POL-PST

        'Yes, (I) introduced Masao to Michiko in my house yesterday.'

        (Sakamoto and Ootsuka 1988: 3)

If our subjects take "jibun" as a pronoun, even if their parameter setting of GCP is still that of their English L1, namely the "unmarked" setting, they will choose a nonlocal interpretation, which is one of the possible interpretations in Japanese. Look at the sentences (22) and (23).

(22) Hutoccho-san$_i$ wa   Yaseccho-san$_j$ ga jibun$_{i/j}$ o   nur-u
     Mr.Fat   TOP Mr. Thin   N self   A   paint-PRS

     to   omoi-mas-u.
     COMP   think-POL-PRS.

     'Mr. Fat thinks that Mr. Thin will paint self.'

(23) Mr. Fat$_i$ thinks that Mr. Thin$_j$ will paint himself*$_{i/j}$.

According to the Governing Category Parameter, the Japanese reflexive "jibun" in (22) refers both to local "Yaseccho-san (Mr. Thin)" and to nonlocal "Hutoccho-san (Mr. Fat)," whereas the English reflexive "himself" in (23) can have only the local "Mr. Thin" as its antecedent. A NS of English learning JSL with English L1 parameter setting for this parameter might be predicted to give only the local interpretation. Then, what will happen if s/he thinks that

"jibun" is a pronoun because the word is also used as a first and second person pronoun in Japanese (e.g., (21))?

Recall that the **Binding Condition** B **states** that a pronoun is free **in** its governing category. A learner of JSL with the English **L1** setting will give the non-local interpretation, if **"jibun"** is taken as a pronoun. This **will** make **him/her** appear to have the Japanese setting.

Now let's go back to the second reason for the use of experimental word list in the present **study**. "Jibun" along with its **English** equivalent was given in this list to make it certain that the subjects use the word as a reflexive in the **experiment.**[28]

1.2.3. Picture Identification Task

So called "UG in SLA **studies"** have used several different kinds of experimental **tasks** to *test* the availability of UG in SLA; (1)act-out tasks **(Flynn 1983),** (2) composition **(duPlessis et al.** 1987; **Phinney 1987),** (3) comprehension tests (White **1988b),** (4) elicited imitation **(Adjémian** and Liceras 1984; Flynn 1983; Flynn **and Espinal 1985;** Merzenich **1989),** (5) absolute grammaticality **judgments** with **single sentence** to be independently judged **(Adjémian** and Liceras 1984; Bley-Vroman et al. 1988; **duPlessis** et **al.** 1987; **Felix** 1988; Ioup and **Kruse 1977;** Kui 1988; Liceras 1989; **Mazurkewich** 1988; **Merzenich** 1989; **Renandya** 1989; Schachter **1989a, 1989b; Suciadi 1989;** Thom 1988; **White 1985a; 1985b; 1986a, 1987c, 1988b, 1989a),** (6) comparative grammaticality judgments with pairs of sentences to be compared (Ritchie 1978; **White 1987b, 1988b, 1989a),** (7) interview **(Clahsen and** Muysken **1986), (8)** multiple choice **antecedent identification** tasks **(Hirakawa** 1989; **Sakamoto** and **Ootsuka** 1988; **Thomas 1989),** (9) **oral/written** translation **(Adjémian** and Liceras 1904; **Sato 1988),** (10) picture identification tasks (Finer **and Broselow 1986,** 1989; **Merzenich 1989;** Shimura and Yoshino **1988),** (11)question formation tasks **(Mazurkewich** 1981; White **1986a),** (12) sentence completion tasks **(Mazurkewich** 1988), (13) spontaneous conversation **(Hilles 1986), and**

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[28] In fact, none of our experimental subjects consistently showed such "nonlocal" interpretation, See the results with the Governing Category Parameter in the second study (Table 33) in Chapter III. This seems to suggest that they did not take "jibun" as a pronoun in the present study.

(14) **timed response sentence matching (Bley-Vroman and Masterson** 1989; Masterson 1988). **Grammaticality** judgments (5 and 6 above), however, are used far more **frequently than** the others.

These tasks are all **performance tasks. They are to measure competence** through performance. Performance **is** a result of interactions between linguistic competence module and other cognitive modules **in** our mind, so performance data obtained **reflect** not **only** the **linguistic** competence but **also** other modules. **This** simple fact, however, seems to be often forgotten in **the** literature. What other cognitive modules are involved in the performance of these experimental **tasks?**

Figure 6 below is **a model of comprehension and production process.** This **is an** expanded version of **such** a model proposed **in** White (1989b) **This,** however, is not intended to be comprehensive **and** it needs to be refined in the further **study.**

Comprehension (PERFORMANCE)
|
|
(2) Interaction of Linguistic COMPETENCE (linguistic knowledge or formal schema) +
Problem Solving + Knowledge in Other Modules (content schema)
| |
| |
| |
(1) Parsing Mechanism   **(3)** Producing Mechanism
Perception Mechanism |
| |
| |
| oral output (PERFORMANCE)
| |
| |
| **(4)** Writing Mechanism
| |
| |
input   written output (PERFORMANCE)
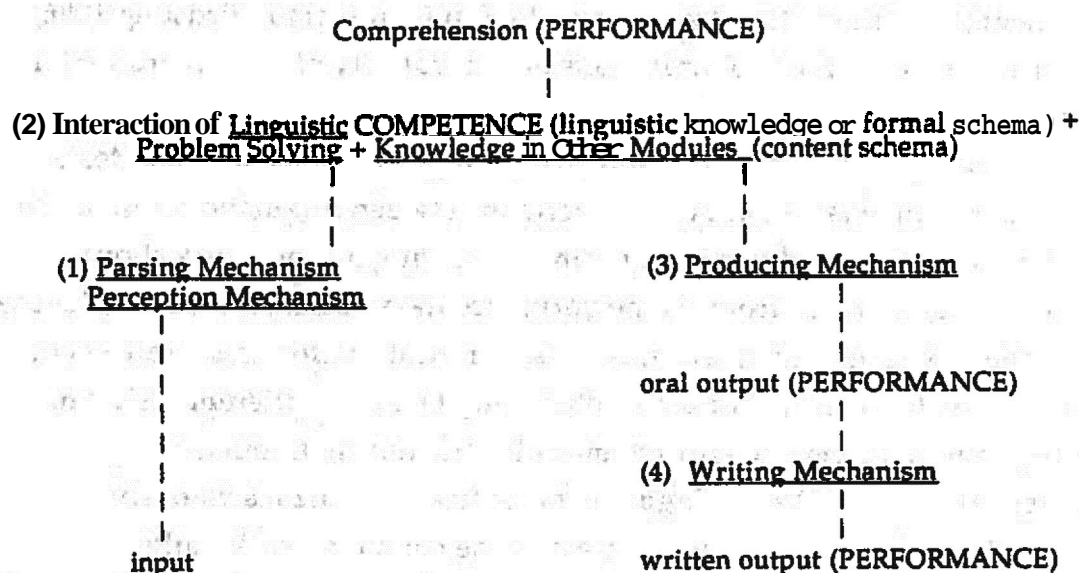
Figure 6 Comprehension and Production Processes

Comprehension of input requires the involvement of two stages of **processing:** (1)Perception and **Parsing** Mechanisms and (2) **Interactions** of multiple **modules** such as a linguistic competence module, a problem solving module, **and knowledge** in other modules. **On** the other hand, **the** oral production of an idea **involves** (2) Interactions of Modules and (3) a

Production Mechanism, while the written production of the same idea requires one more step, (4) a Writing Mechanism.

Chaudron (1985) has suggested the use of several tasks for testing different aspects of input processing in SLA. Figure 7 summarizes these tasks. The ones in bold face are the tasks which have been used in the previous "UG in SLA" studies.

The various tasks which were used in previous studies 'measure different types of performance which are results of different combinations of modules in Figure 6. This accounts for variation in L1 results (see discussion in Section 2.3.2.2. of Chapter II) as well as that in L2 data.

In theoretical linguistics, NS intuitions and grammaticality judgments (GJ) have been dominantly used by linguists to justify and establish their analyses and theories of linguistic competence. The "UG in SLA" research has evolved from this discipline, and most of its studies have naturally used GJ to test the availability of UG in SLA. Although a few researchers (Newmeyes 1983 for the use of GJ in L1 research; Biidsong 1986, 1989 for L2) have pointed to limitations on the validity of the experimental task, the use of GJ is still prevalent.

As was clearly pointed out above, GJ is a performance task and tests performance which is a result of interactions between linguistic competence and other cognitive modules in our mind. Drawing a conclusion about learners' L2 competence from the performance data obtained through the use of GJ alone can be very dangerous, because, I repeat, performance reflects not only linguistic knowledge but other interacting factors. Different tasks tap different combinations of cognitive modules (including linguistic competence) which make up linguistic performance of L2 learners and, therefore have different degree of access to the competence. Ideally, conclusions about linguistic competence, a psychological construct of interest to us, need to be made based on data from several different types of experimental tasks. "Triangulation" or "multi-angulation" of this psychological construct is called for in order to better understand it and to establish construct validity of these tasks. As a first step toward such research, the picture identification task, a type I task in Figure 7 below, will be used in the present study for the following reasons.

Linguistic production

<------------less encoding--------------------More encoding/time------------->

(nonverbal)   (Oral)   (Written)

TASK I	TASK II	TASK III	TASK IV
signal detection	echoic response (short segments)		
pattern recognition pattern matching	imitation (within STM limits)		
categorization		partial dictation (simultaneous aural-graphic)	partial dictation recall (sequential)
		listening cloze (simultaneous)	fixed ratio recall cloze (sequential)
motor response to commands	elicited imitation (longer than STM)	dictation	
selecting pictures	listening cloze (oral response) (no text presented)	listening cloze (written response)	
	rephrasing/ recalling text/ narrative	written recall	
inferencing/ decisions structural analysis grammatical judgments (timed) grammatical judgments (not timed)	retelling	comprehension question responses	
	free production explanation/correction (Oral)	free composition explanation/correction (written)	

VERTICAL AXIS: Degree of Comprehension
top <-----less processing/more processing -----> bottom.
        close to input/distant from the input

Figure 7. ―― Dimensions of Tasks Responding to Input
(modified version of Figure 17-1 in Chaudron (1985 288))

First, the picture identification task was chosen because it is one of the type I tasks which appear to tap linguistic competence with less influence from other cognitive modules than type II, III, and IV tasks.

All tasks require comprehension of input and therefore the use of (1) and (2) stages in Figure 6. They are measuring performance reflecting data. processing by (1)Perception and Parsing Mechanisms and (2) Problem Solving modules and general knowledge as well as linguistic module. The resulting data are thus already quite noisy.

Data obtained from type II, HI, and IV tasks will have more noise, because the type II tasks further involve the use of (3)Producing Mechanisms in Figure 6 for expressing responses orally whereas (4) the Written Mechanism is further employed in the type III and IV tasks for responding in written language. Thus, "relatively" clean data on competence can be obtained by the type I tasks like the picture identification task.

Among the type I tasks, the grammaticality judgment task is the one most frequently used. Other tasks of this type should be utilized more often for multi-angulation of competence. Among them, the picture identification task was chosen for the present study, because it is not used often and also because it should not be susceptible to influence from short-term memory, another possible confounding factor. Signal detection, pattern recognition, and pattern matching tasks among the type I tasks require less processing and, unless experimental sentences are long enough to exceed the short-term memory capacity, these tasks will be testing merely stage (1)in Figure 6, namely, the perception mechanisms and they may not involve stage (2), part of which is the linguistic competence we are interested in.

Thus, the picture identification task will be chosen as the best possible measurement in this study, but, of course, {his does not mean that other measurements are less important for studying the competence. Other measures should be used in the further studies for multi-angulation and better understanding of the linguistic knowledge as well as for establishing construct validity of these experimental tasks.

Then, what is the particular picture identification task used in this study? See Appendix D for a copy of this task. In this task, subjects are presented with a sentence, two pictures (Pictures A and B), and answer choices ("Picture A," "Picture B," or "Both Pictures"). Subjects are asked to

express possible meaning(s) of the experimental sentence by choosing one or both of the pictures. This task was first used by Finer and Broselow (1986) in L2 studies and later methodologically improved by Shimura and Yoshino (1988).

Reliability of this task was assessed in the following manner. All the experimental sentences were paired as in (24).

(24) a. Mr. Fat asks Mr. Thin to paint himself.
      b. Mr. Thin asks Mr. Fat to paint himself.

A close examination of these sentences shows that they are different only by one fact that their subject and object are reversed. By examining the correlation between these sentences in pairs, {he split-hall reliability of the task can be analyzed. This half-test reliability, of course, has to be adjusted for estimating the full-test reliability by the Spearman-Brown Prophecy formula. The adjusted internal reliabilities of the task in the present study were 84.15 percent for the experimental JSL groups, 89.15 for the Japanese L1 control group, and 94.04 percent for the English L1 control group.

1.2.4. Experimental Sentences

In the picture identification task above, 30 Japanese sentences were used to request their possible meaning(s) from the JSL and Japanese LI groups, while the English LI controls worked on the same 30 sentences in English. The order of the sentences was randomized, and two counterbalanced versions were used. All the experimental sentences in the task contained "jibun" or "himself," reflexive pronouns. Of these 30 sentences, 14 were related to the first study on the PAP and 16 to the second study on the GCP. Since these two different types of sentences were mixed and presented at random, these sentences worked as distractors to each other. Complete lists of these sentences are found in Appendices B and C.

Appendix B lists the 14 sentences used in the first study to investigate the acquisition of the Proper Antecedent Parameter. Sentences in (25) are representative of these.

(25) a. **Hutoccho-san** wa **Yaseccho-san ni** jibun no **shashin** o
       Mr.Fat   TOP Mr.Thin   D   self   G picture   A

    mise-mas-u.
    show-POL-PRS.

    'Mr. Fat showed Mr. Thin self's picture.'

 b. **Mr. Fat showed Mr. Thin a picture of himself.**

The sentences listed in Appendix C were used to investigate the parameter setting of the GCP in the second study. Sentences in **(26)** and **(27)** represent these two types of sentences. Of the 16 used for the second **study,** 14 of these belong to the type represented by **(26)** and 2 to (27).

(26) a. Hutoccho-san   wa   **Yaseccho-san ga** jibun o **nur-u**
          Mr.Fat .   TOP   **Mr.Thin**   N   self A Paint-PRS

      to   **omoi-mas-u.**
      COMP think-POL-PRS

      Mr. Fat **thinks** that Mr. **Thin paint self.'**

   b. Mr. Fat thinks that Mr. **Thin will** paint himself.

(27) a. **Hutoccho-san** wa **Yaseccho-san** ni **jibun** o nu-tte
          Mr.Fat   TOP **Mr.Thin**   D **self** A paint-GER

      hoshii   no **des-u.**
      want   **COMP** be-PRS

      '(It) is that Mr. Fat wants Mr. **Thin** painting **self.'**

   b. Mr. Fat **wants** Mr. **Thin** to paint himself.

The sentence in **(26b)** contains **the** reflexive pronoun in the tensed clause, and this type of sentence was called the "tensed **sentence. The** reflexive in the **sentence** in (27b) is in the tenseless infinitive clause, and **this** type of sentence was called the **"tenseless"** sentence. These two **kinds** of sentences were combined for analyses in this thesis, for reasons argued in **3.1.3. in Chapter II.**

1.3. Procedures

All the subjects in **the** Low and **Mid groups,** 6 in the **High** group, and all of the Japanese L1 controls **worked** on **the** four-part experimental packets in one classroom sitting, while 10 subjects in the High group **and** all English

L l controls worked on them at home. This **difference in environment was** inevitable due to extreme difficulty in data collection, but it would be desirable to avoid such differences in order to standardize the task-taking **procedure.**

After filling out the first part of the packet, a questionnaire eliciting biographical data, the experimental groups were given 25 minutes to complete the **CLOZE** test (k=50). **They were then** given two minutes and asked to **work on the** bilingual vocabulary list and to check any words they had not known.

The subjects were then asked to work on the last part of the packet, the picture identification task with 30 randomly ordered Japanese sentences. For each sentence, **the** subjects were requested to read it with focus on what the reflexive pronoun "jibun" in it **referred to and** to think carefully of **possible meaning**(s) of **the sentence.** Then they **were** asked to indicate its possible **meaning(s)** by picking **one** or both of the two pictures provided right **below** the sentence in question. The subjects were informed that there was **no time** limit and (hat they could spend as much time as needed on the picture identification task, although it took less than 15 minutes for most of **them.** All pictures involved the characters, **Hutoccho-san** (Mr. 'Fat) and **Yasecchо-**san (Mr. Thin). A sample of this ta**sk along with the pictures actually used** can be located in Appendix **D.**

Before undertaking **this picture identification task, the subjects were** presented with a detailed instruction she**et for the task, which informed them** that their intuitions about the possible **meaning(s)** of the sentences in question **were** sought in this task. They were also told that the **interpretation** of possible **meaning(s)** can vary even among **NSs** of Japanese **and** that this task **was** not to test their knowledge of grammar rules or ability in **Japanese.** However, it was emphasized **in** the instructions that they should not translate the sentences into English but, instead, think about **their possible meaning(s)** in Japanese. To illustrate **the task** and to help familiarize **the** subjects **with it, an** example sentence **and** two related pictures were provided after the instructions. As noted in **Bley-Vroman** et al. (1988), who **used** similar instructions in their study with the **grammaticality** judgment task, the use of detailed instructions with examples will help standardize sometimes individually taken tasks and ensure comparability across studies.

II. RESULTS AND DISCUSSIONS

2.1. The First Study

In the first study, where the U-SPH was compared with the U-TH and the FDH, parameter-setting process of the PAP was Investigated to test the following research hypothesis, based on predictions by the U-TH and the FDH:

> The interpretation by the learners of Japanese as a second language (JSL) at all proficiency levels is different from that by the Japanese L1 control. (RH1)

Table 27 on the next page summarizes the results in the first study. Japanese LI controls dominantly gave the "subject" interpretations (90.62 percent). This is consistent with the result in the previous study (Shimura and Yoshino 1988). The majority of English controls preferred the "both" interpretation (57.59 percent) to the other interpretations (36.16 percent for the "subject" interpretation and 6.25 percent for the "object"). Once again, this is in agreement with Shimura and Yoshino. The bias toward the 'subject' interpretation over the "object" appears to suggest the possible use by the NSs in the present study of the Interpretation Strategy discussed in Section 2.3.2.2. in Chapter II.

As for the performance of the experimental groups, subjects at all proficiency levels gave interpretations which are significantly different from that of Japanese LI (High, $\chi^2=28.46$, df=2, p<0.05; Mid, $\chi^2=57.36$, df=2, p<0.05; Low, $\chi^2=39.86$, df=2, p<0.05.). This supports the research hypothesis. Since this hypothesis is based on the prediction by the U-TH and the FDH, these hypotheses are consequently supported in the first study, while the U-SPH is rejected.

JSL learners at all levels gave substantial percentages of the "both" interpretation (26.79 percent by the Low group, 27.23 percent by Mid, and 25.45 percent by High), although it was not given as frequently as by the English LI controls (57.59 percent). Transfer of the L1 parameter setting is seen. Also, the fact that a quarter of subjects in the High group gave the LI interpretation

Table 27. —— Grouped Data for the First Study on the Proper
Antecedent Parameter

	N	Japanese "subject" (%)		English "both" (%)		Other "object" (%)	
Japanese L1	16	203	(90.62)	16	(7.14)	5	(2.23)
JSL (all)	48	442	(65.77)	178	(26.49)	52	(7.74)
High	16	160	(71.43)	57	(25.45)	7	(3.13)
Mid	16	134	(59.82)	61	(27.23)	29	(12.95)
Low	16	148	(66.07)	60	(26.79)	16	(7.14)
English L1	16	81	(36.16)	129	(57.59)	14	(6.25)

All, Japanese L1 x High x Mid x Low x English L1, $\chi^2=181.27$, df=8, p<0.05.
Japanese L1 x English L1, $\chi^2=144.72$, df=2, p<0.05.
JSL, High x Mid x Low, $\chi^2=16.57$, df=4, p<0.05.
Japanese L1 x JSL (High), $\chi^2=28.46$, df=2, p<0.05.
Japanese L1 x JSL (Mid), $\chi^2=57.36$, df=2, p<0.05.
Japanese L1 x JSL (Low), $\chi^2=39.86$, df=2, p<0.05.
English L1 x High, $\chi^2=56.12$, df=2, p<0.05.
English L1 x Mid, $\chi^2=42.64$, df=2, p<0.05.
English L1 x Low, $\chi^2=44.94$, df=2, p<0.05.

further suggests fossilization of the L1 setting. This transfer and fossilization of the L1 setting can be explained by the U-TH and the FDH, but not by the U-SPH. Both of the former hypotheses predict a shift from the "marked" L1 value to the "unmarked L2 setting, where negative evidence is required. As listed in Chaudron (1977) and Schachter (1986), several kinds of negative evidence are available to L2 learners both inside and outside L2 classrooms. However, as Birdsong (1989) argued based on previous studies on the role of negative evidence in SLA, such negative evidence is not systematically available to the learners. It was further argued that, even if it is available, there is individual and situational variation as to its use.[29] Such unreliable availability and differential use of negative evidence result in transfer and fossilization of the L1 setting.

Note, however, that statistical analyses also show that three experimental groups were significantly different from the English L1 group (High, $\chi^2=56.12$, df=2, p<0.05; Mid, $\chi^2=42.64$, df=2, p<0.05; Low, $\chi^2=44.94$, df=2,

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[29] For more discussion on this issue, see Birdsong (1989: 127-190).

p<0.05). The parameter setting of the L2 learners thus "appear" to be somewhere between the L1 and L2 values. What does this suggest?

While fossilization of the L1 setting can be recognized in the data, a substantial amount of the L2 "subject" interpretation was also given. The JSL group as a whole gave 65 percent "subject" interpretations, which is much higher than that by NSs of English (36.16 percent) but not as much as that by NSs of Japanese (90.62 percent). Does this mean that the setting of these JSL learners' interlanguage (IL) is somewhere between those of Japanese and English? Results from the grouped data like the ones in Table 27 cannot answer this question. This is because such grouped data miss information about performance of individual subjects (Bley-Vroman et al. 1988).

If half of the L2 learners have the L1 setting and another half have the L2 setting, grouped data for the whole group will show that the parameter setting of the interlanguage (IL) stays somewhere between those of two L1s. We then have to reanalyze data by using a concept of "consistency" and investigate how individual subjects performed.

A learner was considered to have a certain parameter setting if s/he showed a certain interpretation associated with the setting more frequently than a certain cut-off point. Bley-Vroman et al. and Thomas suggested the minimal level displayed in the NSs' responses as a criterion for selecting the cut-off point. NSs in Bley-Vroman et al. performed at a level near or exceeding 90% correct on all experimental sentences, with four exceptions, whereas performance of NSs in Thomas was 80 percent correct for the GCP-related sentences and 71 percent for the PAP sentences. Thus, the selection of {he cut-off point is relative to NSs' performance. Where there is a small number of exceptions, as in Bley-Vroman et al., such a task may be easy. More exceptions, however, can make the selection difficult and subjective. L1 controls in this thesis behaved as predicted with the GCP in English and the PAP in Japanese, where only one interpretation was possible and the NSs' performance exceeded 90% correct. A cut-off point, however, was very hard to select based on the L1 performance on the GCP in Japanese and the PAP in English, where more than one interpretation were possible and sentences were ambiguous. English NSs' performance on the PAP sentences was analyzed individually. Table 28 below shows how many of the NSs performed at various levels of percentage correct.

Table 28. —— Number of NSs of English (N=16) at Various
Levels of Percentage Correct on the PAP sentences

Percentage Correct	Number of NSs of English (%)	
90% correct or above	4	(25.00)
80% or above	4	(25.00)
70% or above	8	(50.00)
60% or above	8	(50.00)
50% or above	10	(62.50)
40% or above	10	(62.50)
30% or above	10	(62.50)
20% or above	14	(87.50)
10% or above	14	(87.50)
10% or below	16	(100.00)

Only 4 out of 16 NSs (25.00 percent) gave the theoretically predicted "both" interpretation above the 80 percent correct level. Even at the lower 60 percent level, only half of the NSs (8 persons) qualified. 10 NSs (62.5 percent) performed above the 30 percent correct level and 14 (87.50) above the 10 percent. 2 (12.50 percent) performed below the 10 percent correct level, one of whom did not give the "both" interpretation at all. Similar performance variation among the NSs of Japanese was found with respect to the GCP, as shown in Table 29 which gives the number of Japanese NSs at various levels of percentage correct on the GCP sentences.

Table 29. —— Number of NSs of Japanese (N=16) at Various
Levels of Percentage Correct on the GCP sentences

Percentage Correct	Number of NSs of English (%)	
90% correct or above	3	(18.75)
80% or above	5	(31.25)
70% or above	6	(37.50)
60% or above	10	(6150)
50% or above	11	(68.75)
40% or above	11	(68.75)
30% or above	12	(75.00)
20% or above	12	(75.00)
10% or above	14	(87.50)
10% or below	16	(100.00)

With this variation in performance among the NSs of English on the PAP and NSs of Japanese on the GCP, it was hard to decide where to draw the reasonable cut-off line. Thus, due to the nature of parameters used in the present study, which allows more than one interpretation, the criterion based on L1 results could not be used here. We needed a mote objective and independent criterion. A statistical criterion similar to the one in Ritchie (1978) was used instead in this study.

'Nine' was chosen as the cut-off point for the first study with 14 experimental sentences. The criterion for the choice of this number is statistical. This figure was obtained by using chi-square analysis. Look at Table 30 below.

Table 30. —— Possible Combinations of **Three** Variables and Their Chi-square Values

Combination of Variables	χ^2	Combination of Variables	χ^2
14-0-0	27.98**	10-2-2	9.14*
13-1-0	22.41**	9-5-0	8.70*
12-2-0	17.67**	9-4-1	6.99*
12-1-1	17.27**	9-3-2	6.14*
11-3-0	13.85**	8-6-0	7.42*
11-2-1	12.99**	8-5-1	5.27, ns.
10-4-0	10.85**	8-4-2	4.00, n.s.
10-3-1	9.56**	8-3-3	3.57, n.s.

**$p < 0.01$, *$p < 0.05$

When there are three variables, the sum of which is 14, as long as one of them is larger than 9, the chi-square value for the distribution of these three numbers is always significant ($df = 2$, $p < 0.05$).

Thus, if a subject showed a certain interpretation 9 times or more, his/her interpretation was regarded to have consistently shown a certain parameter setting related to the interpretation. Table 31 below summarizes data horn such an analysis.

Table 31.—— Consistency Data for the First Study on the Proper Antecedent
Parameter

		Consistent (≥9)						Not Consistent (≤8)	
	N	Japanese "subject" (%)		English "both" (%)		Other "object" (%)		(%)	
Japanese L1	16	15	(93.75)	0	(0.00)	0	(0.00)	1	(6.25)
JSL (all)	48	29	(60.42)	11	(22.92)	0	(0.00)	8	(16.67)
High	16	12	(75.00)	4	(25.00)	0	(0.00)	0	(0.00)
Mid	16	7	(43.75)	4	(25.00)	0	(0.00)	5	(31.25)
Low	16	10	(62.50)	3	(18.75)	0	(0.00)	3	(18.75)
English L1	16	5	(31.25)	8	(50.00)	0	(0.00)	3	(18.75)

Note that, due to a relatively small number of subjects in each group,
frequencies in the table are unfortunately too small for any statistical analyses
to be used. Although this was inevitable because of the difficulty involved in
finding appropriate subjects for this thesis, a larger number of subjects would
be desirable for statistical analyses.

40 out of 48 JSL learners in this study (83.34 percent) consistently
showed either L1 or L2 parameter settings, while eight subjects (16.67 percent)
did not give consistent interpretations. It can be concluded from this analysis
that the parameter setting of the L2 learners' IL is not somewhere between
those of the two L1s. Such an insight could not have been gained only
through the analyses of the grouped data which are often used as the only
data base in the literature.

The above data based on consistency of interpretations show the same
pattern in LI data as the grouped data in Table 27. All but one NS of Japanese
(93.75 percent) consistently gave the unmarked "subject" interpretations,
while majority of English LI controls (50.00 percent) showed the marked
"both" interpretations with the "subject" interpretation (31.25 percent)
preferred over the "object" (0.00 percent) probably due to the Interpretation
Strategy.

As for the L2 results, transfer and fossilization of the LI setting were
also seen across the proficiency groups. 4 subjects (18.75 percent) in (he High
and Mid groups and 3 (18.75) in the Low consistently gave the English "both"

interpretation. The U-SPH which does not predict such L1 transfer can be rejected.

All experimental groups appear to be different from the Japanese L1 group. While 15 out of 16 NSs of Japanese (93.75 percent) consistently gave the "subject" interpretation, the numbers of JSL learners who gave this interpretation are smaller (12 subjects (75.00 percent) in the High group, 7 (43.75) in the Mid, and 10 (62.50) in the Low). Also, only one NS of Japanese gave inconsistent responses, but there were 8 JSL learners who responded inconsistently (5 in the Mid and 3 in the Low groups). Thus, the research hypothesis of the first study which is based on the U-TH and the FDH was supported also in the consistency data.

60.42 percent of the JSL learners as a whole consistently showed the L2 setting. Since the two lower proficiency groups showed L1 transfer and also because fossilization can be seen across the proficiency groups, the U-SPH can be rejected, but the U-TH and the FDH, the hypotheses supported here, cannot predict such successful cases among the subjects unless negative evidence can be shown to be available.

The possibility that negative evidence was available has to be rejected. No negative evidence for this parameter was found in the pre-experimental analyses of experienced JSL teachers, textbooks, and bilingual dictionaries (see Section 3.2 in Chapter I). One possible explanation of the "successful" acquisition of the L2 setting is the over-generalized use of the Interpretation Strategy, or the bias toward the fust element in the tensed clause. If the L2 learners transfer this strategy to L2, they will find it works, because it will give the correct L2 interpretation ("subject") and therefore it will never be falsified by the L2 input.

In summary, the research hypothesis of the present study was supported and consequently the U-Th and the FDH on which the research question was based were supported in the first study.

2.2. The Second Study

The second study **examined the parameter setting** process of the GCP to test **two** sets of research hypotheses. The first set of research hypotheses based on the U-SPH and the U-TH includes:

> **The** acquisition of L2 **setting in the Governing Category Parameter is** relatively easy and early. **The** parameter setting of L2 learners at proficiency levels of low and middle, and, definitely, of **high** is the same as that of the native speakers of Japanese. (RH2-a-i)

> L2 **learners' performance in the second study positively correlate with** (1) the length of exposure to JSL in total (LET), (2) the length of exposure to JSL in a **classroom setting (LEC), and (3) length of stay in** Japan where **the** target language is spoken (LOS), indices of quantity **and** quality of input. **(RH2-a-ii)**

> **The** following two **hypotheses are in the second set of research** hypotheses based on the FDH:

> The parameter setting of L2 learners at all proficiency levels is different from that of the native speakers of Japanese. (RH2-b-i)

> L2 learners*performance in the second **study** does not positively correlate with (1) **the** length of exposure to JSL in total (LET), (2) the length of exposure to JSL in the classroom setting **(LEC),** and (3) the **length** of stay in Japan where the target language is spoken (LOS), indices of **quantity** and quality of input. (RH2-b-ii)

First, let us look at the first research hypotheses in these two **sets** of hypotheses **(RH2-a-i** and **RH2-b-i).** Table 32 on the **next** page summarizes the grouped data for the second study.

English Ll controls gave 92.19 percent "local" interpretation, while the majority of Japanese controls gave the "both" interpretation (58.59 percent) with the "nonlocal" interpretation (28.52 percent) preferred to the "local" interpretation (12.89 percent) **when the** "both" interpretation was not chosen. **This is** consistent **with** the LI results in **Shimura** and **Yoshino.** Once again, the fact that the "non-local" subject was preferred to the "local" subject by some NSs of Japanese appears to suggest the use at the performance level of **the** Interpretation Strategy among **the** Japanese controls.

Table 32. —— Grouped Data for the Second Study on the Governing Category Parameter

	N	Japanese 'both' (%)		English "local' (%)		Other "nonlocal" (%)	
Japanese L1	16	150	(58.59)	33	(12.89)	73	(28.52)
JSL (all)	48	193	(25.13)	426	(55.47)	149	(19.40)
High	16	101	(39.45)	106	(41.41)	49	(19.14)
Mid	16	46	(17.97)	158	(61.72)	52	(20.31)
Low	16	46	(17.97)	162	(63.28)	48	(18.75)
English L1	16	18	(7.03)	236	(92.19)	2	(0.01)

All, Japanese L1 x High x Mid x Low x English L1, χ^2=378.21, df=8, p<0.05.
Japanese L1 x English'L1, χ^2=162.07, df=2, p<0.05.
JSL, High x Mid x Low, χ^2=45.27, df=4, p<0.05.
Japanese L1 x High, χ^2=52.62, df=2, p<0.05.
Japanese L1 x Mid, χ^2=204.20, df=2, p<0.05.
Japanese L1 x Low, χ^2=145.68, df=2, p<0.05.
English L1 x High, χ^2=150.64, df=2, p<0.05.
English L1 x Mid, χ^2=74.00, df=2, p<0.05.
English L1 x Low, χ^2=68.34, df=2, p<0.05.

When L2 results are examined, it was found that all experimental groups were significantly different from tile Japanese L1 group (Low, $\chi^2=145.68$, df=2, p<0.05; Mid, $\chi^2=204.20$, df=2, p<0.05; High, $\chi^2=52.62$, df=2, p<0.05). Thus, (he first research hypothesis in the second set of hypotheses (RH2-b-i) was supported. That is, the parameter setting of L2 learners at all proficiency levels was different from that of the native speakers of Japanese. Since this was based on the FDH, this hypothesis is supported over the U-SPH and the U-TH here.

As was pointed out in the analysis of the grouped data in the first study, grouped data such as these in Table 32 miss information about individual subjects. Data in the second study were therefore also analyzed by using the concept of consistency. The cut-off point for the second study with 16 experimental sentences was statistically calculated to be 10 (p<0.05). Results of such reanalysis were summarized in Table 33 below. Note once again that statistical analyses could not be made due to low frequencies in the data.

All but one English L1 control (93.75 percent) consistently showed the unmarked "local" interpretations, while majority of Japanese L1 controls (62.50 percent) gave the marked "both" interpretations with bias toward the "nonlocal" interpretation (12.50 percent) over the "local" (6.25 percent) where the "both" interpretation was not given. This bias is possibly due to the Interpretation Strategy.

Table 33. — **Consistency Data for the** Second Study on the Governing Category Parameter

		Consistent (≥10)				Not Consistent (≤9)	
	N	Japanese "both" (%)		English "local" (%)		Other "nonlocal"	
Japanese L1	16	10	(62.50)	1	(6.25)	2 (12.50)	3 (18.75)
JSL (all)	48	7	(14.58)	23	(47.92)	0 (0.00)	18 (37.50)
High	16	5	(31.25)	4	(25.00)	0 (0.00)	7 (43.75)
Mid	16	1	(6.25)	7	(43.75)	0 (0.00)	8 (50.00)
Low	16	1	(6.25)	12	(75.00)	0 (0.00)	3 (18.75)
English L1	16	1	(6.25)	15	(93.75)	0 (0.00)	0 (0.00)

All JSL groups seem to be different from the Japanese L1 control group. Only a small number of JSL learners consistently showed the Japanese "both" interpretation (5 subjects (31.25 percent) in the High group and 1 (6.25) in the Mid and Low groups). This once again supports the first research hypothesis in the second set of hypotheses (RH2-b-i). This hypothesis predicted such a difference. Thus, both the grouped and the consistency data supported the first research hypothesis of the second set and, consequently, the FDH over the U-SPH and the U-TH.

Now let's look at the results regarding the second research hypotheses (RH2-a-ii and RH2-b-ii) for this *study.*

In order to investigate the relationship between the performance in this study and three indices of quality and quantity of input (LET, LEC, and LOS), one point was given to every correct L2 interpretation by the JSL subjects and their scores were correlated with the above indices. Table 34 shows the correlation coefficients between the task scores in the second study and the three indices.

Table 34. —— Correlation between Performance in the Second *Study* and Indices of **Quality** and Quantity of Input

	Performance
LET	0.3994*
LEC	0.0042
LOS	0.3217*
*p<0.05	

The coefficients for LET and LOS were significant while that for LEC was not significant. This significance, however, only rejects the null hypothesis that the set of data are not correlated with each other at all. This just means that these correlations are not spurious. Significance does not imply that the coefficients are "significant" in the sense of meaningful (Brown In press). One way to examine how meaningful the correlations (r)

are is to calculate the coefficient of determination (r^2). This coefficient tells us "what percent of the variance in the two sets of scores is common to both" (ibid.: 151). The coefficients of determination (r^2) for the above correlations (0.1595 for LET, 0.0000 for LEC, and 0.1035 for LOS) suggest that these indices of quality and quantity of input account for only 15.95 percent, 0.00 percent, and 10.35 percent, respectively, of the performance in the present task, and vice versa. It can be concluded then that this result appears to support the hypothesis in the second set (RH2-b-ii) and, consequently, the FDH which this hypothesis was based on.

Transfer of L I setting, the "local" interpretation, can be recognized among subjects across all proficiency levels, although its percentage decreases as the proficiency level goes higher (75 percent by the Low, 43.75 percent for the Mid, and 25.00 percent for the High). Furthermore, despite the fact that subjects in the High group had been exposed to their L2 for 10.86 years on the average in terms of LET and lived in Japan for the average of 5.94 years (LOS), a quarter of these subjects with presumably sufficient amount of exposure to positive evidence related to the GCP in JSL still appear to have the L1 setting. The LI value has been fossilized. Since positive evidence should be readily available in L2, if the U-SPH and the U-TH were correct, these highly advanced learners of JSL should have achieved the L2 setting. Positive evidence alone is thus not enough for the acquisition of the L2 setting. This fact can probably be regarded as a further supporting evidence for the FDH which projects difficulty in acquisition of L2 settings due to proposed unavailability of UG in SLA and the consequent requirement of evidence that is more than just positive evidence.

As discussed in Chapter I, the three competing hypotheses——the U-SPH, the U-TH, and the FDH——predicted two research hypotheses for the first study. Data in previous studies with the same research design as the first study of this thesis motivated the one based on the FDH (RH1) to be tested in the first study. Results in the first study supported this hypothesis and the FDH. Two sets of research hypotheses were projected for the second study by the three competing hypotheses; one set based on the U-SPH and the U-TH and the other on the FDH. While no previous studies had tested the second hypotheses (RH2-a-ii and RH2-b-ii) in these sets, several studies were relevant to the first hypotheses (RH2-a-i and RH2-b-i). However, it was difficult to

choose between the two, because the previous studies with the same research design as the second **study** provided **mixed** results. **Shimura** and Yoshino (1988) and **White** (1989a) supported the **FDH-based hypothesis (RH2-b-i), but** Hirakawa (1989) endorsed the one based on the U-SPH and the U-TH (RH2-a-i), while results In Thomas **(1989) could** be **taken** to support either of them. As a **result,** both **sets** of **research** hypotheses were tested and compared in the second **study** and the set based on the FDH was supported.

All the previous **studies** looked at the **PAP except** for White who examined the adjacency condition on case assignment. Since the first hypothesis in the set based on **the** FDH **(RH2-b-i) had been** supported by previous **studies examining two** different UG principles and also because the results in the **second study** in this **thesis supported not only** this hypothesis but also the second one in the same set of hypotheses **(RH2-b-ii),** we propose that the **FDH** is the working hypothesis in SLA.

Then, why did Hirakawa and Thomas **get** the results which were different from those in Shimura and **Yoshino,** although they all studied the **same** UG principle, the PAP?

First, it might be thought that the differing results may **be** due to differences in the tasks used in these studies. **While** Shimura and **Yoshino** used a picture identification task, Hirakawa and Thomas **used** a multiple-choice antecedent identification task. **However, task** differences probably are not the explanation, as a consideration of (he results summarized In Table 35 shows.

Results in the three studies do not differ essentially from each other in Japanese L1 and ESL. This cannot be explained by the task difference assumption above. If this difference had **affected** results, these studies should have **shown** differences in all languages. NSs of Japanese in all studies gave a **very** high **percentage of** the "subject" interpretation (95.45 percent in Hirakawa and 91.25 In Shimura and Yoshino). **The** majority of responses by the ESL groups were the "subject" interpretation (73.85 percent in Hirakawa, 59.71 in Thomas, and 67.92 in Shimura and **Yoshino)** and 10 to 20 percent of responses were the "object" interpretation (20.31 percent in Hirakawa, 11.83 in Thomas, and 10.83 percent in **Shimura** and Yoshino). **Although** a **relatively** small percentage of responses were **the** "both" interpretation In Hirakawa (5.54 **percent),** ESL learners in the other two

Table 35. —— Summary of Results in Hirakawa (1989), Thomas (1989), and Shimura and Yoshino (1988)

	English L1			ESL[a]			Japanese L1		
	S (%)	O (%)	B (%)	S (%)	O (%)	B (%)	S (%)	O (%)	B (%)[b]
Hirakawa	67.00	21.00	12.00	73.85	20.31	5.54	95.45	1.82	2.73
Thomas	72.82	2.54	24.73	59.71	11.83	28.58	—[c]	—	—
Shimura and Yoshino	37.50	11.25	51.25	67.92	10.83	21.25	91.25	3.75	5.00

a. ESL learners in Hirakawa and Shimura and Yoshino were NSs of Japanese, while those in Thomas were NSs of Chinese.
b. S(ubject), O(bject), B(oth)
c. Thomas did not collect Chinese L1 data.

studies gave about the same percentage of this interpretation (28.58 percent in Thomas and 21.25 in Shimura and Yoshino).

The three studies, however, differ in English L1 results. While a majority of English NSs in Hirakawa and in Thomas gave the "subject" interpretation (67.00 percent in Hirakawa and 72.82 in Thomas), half of the NSs in Shimura and Yoshino gave the "both" interpretation (51.25 percent). This difference can be explained by the following three possible methodological problems in Hirakawa and in Thomas.

First, Hirakawa did not provide any instructions on possible ambiguity in sentence interpretations to her subjects. Both Thomas and Shimura and Yoshino gave examples of ambiguous sentences to their subjects and showed that some sentences could have ambiguous interpretations. This lack of instruction on possible ambiguity explains the relatively low percentage of the "both" interpretation for English L1 as well as ESL in Hirakawa. This lack of instruction may have also interacted with the Interpretation Strategy to make the percentage of the "subject" interpretation relatively high in Hirakawa.

Shimura and Yoshino used 15 experimental sentences to examine the PAP in ESL. Hirakawa and Thomas, on the other hand, used only 5 and 7 sentences, respectively. A small number of experimental sentences can lower the reliability of the experimental task in these studies.

The relatively high percentages of the "subject" interpretation given by the NPs of English in Hirakawa and Thomas may suggest that the subjects' judgment could have been influenced by pragmatic factors. Judging from the list of experimental sentences in Hirakawa, this was probably not a factor in Hirakawa. Rather, the high "subject" interpretation in die study was, as argued above, probably due to the interaction between the lack of instruction on ambiguity and the use of the Interpretation Strategy by the subjects. As for Thomas, while the list of experimental sentences is not available and it is hard to determine if pragmatic factors had any effect, the high percentage of the "subject" interpretation despite the instructions on possible ambiguity may be due to pragmatic factors.

These methodological problems in Hirakawa and Thomas appear to have led them to results different from those in Shimura and Yoshino. One may conjecture that, if these studies had been conducted without these problems, their English L1 subjects would have performed like those in Shimura and Yoshino and the hypothesis based on the FDH would have been supported. The studies by Hirakawa and Thomas should be replicated with improved methodology to see if this argument is correct.

The role of positive evidence in parameter resetting was at stake in the second study. Positive evidence has been assumed to be used by L2 learners to shift the LI unmarked setting to the L2 marked setting as soon as it becomes available in input. This assumption, however, may have to be questioned. Schmidt (1989) argues, based on his comprehensive review of literature on the role of consciousness in language acquisition, that mere availability of data in input does not guarantee the acquisition of a target structure by a language learner because subliminal language learning is impossible. The learner has to "consciously notice" the target structure to acquire it. The L2 learner has to "consciously notice" positive evidence available in the input to switch from the LI unmarked to the L2 marked settings. However, what does it mean by "consciously notice?"

Citing studies in Ceci and Howe (1982) and Miller (1985), Schmidt further argues that the child and the adult are different in the mode of awareness and that this difference explains the child/adult differences in SLA. Children are in a passive mode and they have an open awareness of the environment. Children can "consciously notice" positive evidence available

in input **whether they attend to it or not. Even if positive evidence is** available, adults in a controlled mode, on the other hand, have to pay attention to positive evidence to "consciously notice" it and to use it for parameter **resetting. If this is** true, this presents an alternative explanation compatible with **the U-SPH** and the U-TH to the results in the second **study.**

The **FDH** could explain the observed failure in **the** study, while the U-SPH and the U-TH could **not. However, even if** UG is assumed to be available, the observed fail**ure in** the second study can be explained **by** applying the above **child/adult** difference in the mode of awareness. Ad**ult** L2 learners in the second study, although they had a full access to UG, failed to acquire the L2 **setting** because they could not consciously notice **relevant** positive evidence available in the input. **This** is a very **interesting argument** and **may** constitute an alternative hypothesis to the FDH. **This hypothesis** is **similar** to "competition model" (Felix 1976,1981,1985,1987,1988) in that both **attempt** to explain the observed failure **in** adult SLA by **assuming competition** between UG and something not linguistic, namely, the general **problem-**solving **system in Felix** and the mode of awareness in the alternative hypothesis. However, previous empirical studies investigating **the child/adult** difference in **the** mode of awareness **(e.g.** studies in Ceci and Howe (1982) and Miller (1985)) have used **non-linguistic** items **(e.g.** pictures **of** common objects) or words, when linguistic, to show the difference. Their findings might be applied to the acquisition of surface syntactic structures, but probably not with certainty to abstract principles like UG principles used in this thesis. Further studies using UG principles should be conducted to test the mode **difference** before **fully** accepting the alternative explanation to **the** second study.

In summary, the first study in the present thesis examined acquisitional process of parameter setting of the Proper Antecedent Parameter in JSL and the **U-SPH** was compared with the **U-TH** and the FDH. It was concluded that either the **U-TH** or the FDH was **the** working hypothesis of **SLA,** while the U-SPH was rejected.

The Governing Category Parameter was investigated in the second study to compare the **U-SPH** and the **U-TH** with **the** FDH. **As** we have seen, the FDH was supported in the study while the U-SPH and the **U-TH** were

rejected. Table 36 **below** summarizes **these results** from **the two studies in** this thesis.

Table 36

Summary of the First **and** Second Studies

	The U-SPH	The U-TH	The FDH
The First Study	No	Yes	Yes
The Second Study	No	No	Yes

The research question of the present study **was:** which of the **three** hypotheses best **explains the** second language acquisition process? **Based** on the **results** from the **two** studies in this Chapter, **we** support the **Fundamental** Difference **Hypothesis.** This hypothesis was supported in both studies. **Since** this thesis **investigated** the post-puberty adult **SLA, we** further argue that die **LAD** which was proposed for the **LI** acquisition **to solve the** logical problem of **LI** acquisition is no longer available in the adult **SLA** and that **this innate** domain-specific device is replaced by the **conscious** and **unconscious** knowledge of the **LI** and **the non-domain** specific unitary cognitive system which is used by adults in all their cognitive activities including language acquisition.

III. CONCLUSION

SLA studies are faced with a "tri-lemma" with three competing hypotheses. These hypotheses are: (1)the UG-Subset Principle Hypothesis (U-SPH), (2) the UG-Transfer Hypothesis (U-TH), and (3) the Fundamental Difference Hypothesis (FDH). Two studies with specific designs were suggested to systematically test these three hypotheses and to solve the tri-lemma in SLA.

The Governing Category Parameter and the Proper Antecedent Parameter, two parameters used in the two studies, were theoretically discussed horn the Government and Binding theory perspective in Chapter II. Data from the previous studies were examined to see how parameter setting of these parameters proceed. Three research hypotheses for the present thesis were presented at the end of Chapter II.

Both group and consistency data on parameter setting process of the Proper Antecedent Parameter were investigated in the first study to compare the U-SPH with the U-TH and the FDH. A research hypothesis derived from the U-TH and the FDH was supported in the first study and the U-TH and the FDH were supported, while the U-SPH was rejected.

Two sets of research hypotheses were tested in the second study where the Governing Category Parameter was investigated to compare the UG-based hypotheses, the U-SPH and the U-TH, with the FDH. Both group and consistency data supported the latter non-UG-based hypothesis.

Based on the results from these two studies, it was concluded that the FDH was the working hypothesis for SLA. This study alone, however, is not sufficient to give the final answer to the question on the availability of LAD or UG in SLA, because the present study unfortunately and inadvertently suffers from several shortcomings. These weaknesses of this thesis along with suggestions for the future studies follow.

First, not all the subjects participated in the experimental task under the same conditions. Some took the task in supervised classrooms, while others worked on it at home. Such a difference in task taking conditions may have introduced variability in data and makes data interpretation difficult.

Due todifficulties involved in data collection, the number of subjects was relatively small. For statistical analyses, a larger number of subjects

would be needed. In fact, **the** consistency data in both the first and **the** second studies could not be analyzed statistically.

Thus, a large number of subjects are desirable, especially for statistical analyses. However, it is probably also true that one **linguistically** sensitive subject **gives** us more insight into the linguistic competence than hundreds of linguistically naive subjects. **An** independent measure of subjects' linguistic **sensitivity,** if available, might have been very useful for better analyses and understanding of our data.

JSL learners whose L I parameter **settings** of the GCP and the PAP **are** the same as those in Japanese should have been used as another type of controls. Otherwise, one may argue that the observed significant differences between the NSs of Japanese and JSL learners are attributed **not** to the partial availability of UG but to a more general difference between **LI** and L2 which has **nothing** to do with UG.

This was a cross-sectional **study. It** would be very interesting to see if the same conclusion will be reached in a longitudinal study. Acquisition of the **GCP** and the PAP by JSL learners should be investigated over time. **Since** longitudinal studies are scarcely ever done in **this** area of study, **the** same thing is true with studies investigating other UG principles.

In the analyses of the GCP in previous L1 studies, it was suggested that data on the **"tensed"** and the **"tenseless"** sentences be analyzed separately. However, it was shown to be difficult to do so in **our** corss-linguistic comparisons **due** to differences in verb **subcategorizations** between Japanese and **English** and they were combined in data analyses (see the **argument** in Section 3.1.3 **in** Chapter II). **For** finer analyses and better understanding of data, experimental sentences should be carefully constructed in the future studies and the two sentence **types** should be **separated** even in **cross-**linguistic comparisons.

Although it was beyond the scope of this thesis, the JSL **CLOZE** test used to measure proficiency of the L2 **learners should have** been standardized. While (here are a couple of standardized criterion-referenced tests in JSL such as *Nihongo Kentee Shiken*, there appears **to** be few standardized **norm-referenced** tests. standardization of **the** CLOZE test in this thesis should be useful not only for **similar** UG studies in JSL but **also** for any **SLA** studies in JSL which Investigate JSL **developmentally.**

While there are a few developmental studies on the GCP and the PAP in English LI, a pilot study in Otsu (1987b) was the only one in Japanese Ll. More has to be done in this area in the further studies.

Linguistic competence is a psychological construct and performance tasks like the picture identification task in our study can not tap it 100 percent. For better understanding of competence and also for establishing construct validity of our experimental tasks, multi-angulation of the psychological construct is necessary. Diverse parameters should be investigated through diverse experimental tasks, especially first with the type I tasks in Figure 7, in further studies with the same two experimental designs as the present thesis to systematically test the three competing hypotheses.

Also, we still do not know much about what each experimental task is actually testing even in LI. More ,empirical studies should be conducted to extend our understanding of the tasks themselves. Further, these tasks are the performance tasks and performance is a result of interactions between the linguistic and non-linguistic modules in our brain. More studies on the linguistic module, the non-linguistic modules, and the interaction process are also needed to understand the tasks themselves.

This thesis was conducted to solve the tri-lemma in SLA and the FDH was shown to be the working hypothesis for SLA. This suggests that UG is not fully available in SLA. Still, this study suffered from the above shortcomings. To truly answer the tri-lemma, it should be replicated on different L2 groups with refined measures, methods, and analytical techniques. Also, if the FDH is the working theory of SLA, it must explain all available data. Mixed results in the previous studies investigating the availability of UG have to be reinterpreted in the light of the FDH. Further studies following the suggestions above will contribute to this goal.

APPENDIX A

Table 37
Detailed Biographical Data of Subjects

#	CLOZE SCORE Exact	Appropriate	Age	Starting Age	LET	LEC	LOS
1	8	10	40.42	31.0	4.00	1.25	0.42
2	9	15	22.67	22.00	0.67	0.67	0.75
3	10	18	33.50	25.67	7.83	1.00	5.50
4	11	21	25.00	20.00	3.00	3.00	1.00
5	12	19	21.16	19.50	1.75	1.42	1.00
6	12	19	30.33	23.50	4.00	1.00	7.16
7	13	18	25.92	25.33	0.75	0.75	1.08
8	14	18	31.92	28.00	3.92	0.00	3.25
9	15	23	37.58	35.00	2.00	0.50	2.00
10	16	23	34.83	23.16	5.00	0.50	4.16
11	17	24	27.92	22.75	5.16	1.00	2.50
12	17	24	30.42	21.75	8.67	0.50	9.08
13	17	28	24.50	18.75	4.16	4.16	1.08
14	18	24	31.42	19.00	4.00	3.50	0.42
15	19	25	42.75	39.00	3.50	0.50	3.42
16	19	28	45.92	33.00	1.00	0.00	0.42
17	20	24	32.50	28.75	3.75	0.50	4.33
18	21	32	25.16	19.00	4.00	4.00	1.67
19	22	27	35.33	26.83	5.00	3.50	5.83
20	22	30	36.50	26.00	2.00	1.00	9.33
21	22	34	38.58	24.00	12.00	1.00	14.75
22	23	31	34.33	19.16	8.00	1.33	14.75
23	23	37	33.92	22.00	5.50	5.00	1.67
24	24	30	29.16	23.00	3.00	3.00	1.00
25	24	33	19.33	15.00	4.25	4.00	0.67
26	24	33	33.67	19.75	13.92	2.00	6.08
27	24	40	20.83	16.67	4.25	3.30	1.08
28	25	32	20.50	18.00	2.50	2.00	0.67
29	25	37	27.50	20.42	7.08	0.25	2.00
30	25	40	35.58	23.33	2.33	2.33	0.42
31	26	34	21.50	18.25	3.50	3.25	0.33
32	26	37	20.25	16.00	3.00	3.00	0.25
33	27	39	26.08	19.50	3.00	3.00	1.00
34	28	43	54.75	20.83	34.75	0.33	2.00
35	28	44	43.42	23.00	10.00	0.25	2.42
36	29	44	41.00	17.83	19.60	4.00	3.75
37	30	43	20.75	18.92	1.75	1.75	0.75
38	30	44	38.58	28.00	11.00	2.00	8.25
39	32	45	20.67	18.00	3.00	3.00	0.75

LET (Length of Exposure to L2 in Total), LEC (Length of Exposure to L2 in Classroom setting), LOS (Length Of Stay in a country where L2 is spoken).

Table 37
(Continued) Detailed Biographical Data of Subjects

#	CLOZE SCORE Exact	Appropriate	Age	Starting Age	LET	LEC	LOS
40	32	45	25.67	22.16	3.60	1.25	1.50
41	33	43	42.92	31.83	11.16	0.16	11.08
42	34	45	21.16	19.00	2.00	2.00	7.83
43	34	45	19.75	13.42	6.33	6.00	4.33
44	34	48	31.25	17.67	6.00	0.00	6.08
45	35	44	46.16	27.33	19.00	0.33	19.00
46	35	49	46.00	39.00	7.00	2.00	7.16
47	37	49	38.16	20.08	18.08	5.00	3.00
48	38	49	43.25	25.75	17.50	0.00	16.16

LET (Length of Exposure to L2 in Total), LEC (Length of Exposure to L2 in Classroom setting), LOS (Length Of Stay in a country where L2 is spoken).

APPENDIX B EXPERIMENTAL SENTENCES FOR THE FIRST STUDY

17. | Hutoccho-san | wa | Yaseccho-san | ni | jibun | no | shashin | o |
     |---|---|---|---|---|---|---|---|
     | Mr. Fat | TOP | Mr. Thin | D | self | G | picture | A |

mise-mas-u.
show-POL-PRS.

'Mr. Fat shows Mr. Thin self's picture.'

18. Yaseccho-san wa Hutoccho-san ni jibun no shashin o
misemasu.

19. | Hutoccho-san | wa | Yaseccho-san | ni | jibun | no | shashin | o |
     |---|---|---|---|---|---|---|---|
     | Mr. Fat | TOP | Mr. Thin | D | self | G | picture | A |

age-mas-u.
give-POL-PRS.

'Mr. Fat gives Mr. Thin self's picture.'

20. Yaseccho-san wa Hutoccho-san ni jibun no shashin o
agemasu.

21. | Hutoccho-san | wa | Yaseccho-san | ni | jibun | ni-tuite-no |
     |---|---|---|---|---|---|
     | Mr. Fat | TOP | Mr. Thin | D | self | about |

shitsumon   o   shi-mas-u.
question   A   do-POL-PRS

'Mr. Fat asks Mr. Thin a question about self.'

22. Yaseccho-san wa Hutoccho-san ni jibun ni-tuite-no
shitsumon o shimasu.

23. | Hutoccho-san | wa | Yaseccho-san | ni | jibun | ni-tsuite-no |
     |---|---|---|---|---|---|
     | Mr. Fat | TOP | Mr. Thin | D | self | about |

hanashi   o   shi-mas-u.
story   A   do-POL-PRS

'Mr. Fat tells Mr. Thin a story about self.'

24. Yaseccho-san wa Hutoccho-san ni jibun ni-tsuite-no
hanashi o shimasu.

25. Hutoccho-san wa Yaseccho-san ni jibun no shashin o
    Mr. Fat   TOP Mr. Thin   D self G picture A

    mot-te   iki-mas-u.
    take-GER   go-POL-PRS

    'Mr. Fat goes to take to Mr. Thin selfs picture.'

26. Yaseccho-san wa Hutoccho-san ni jibun no shashin o
    motte ikimasu.

27. Hutoccho-san wa Yaseccho-san ni jibun ni-tsuite-no
    Mr. Fat   TOP Mr. Thin   D self about

    hanashi o yomi-mas-u.
    story   A read-POL-PRS

    'Mr. Fat reads Mr. Thin a story about self.'

28. Yaseccho-san wa Hutoccho-san ni jibun ni tsuite no
    hanashi o yomimasu.

29. Hutoccho-san wa Yaseccho-san ni jibun ni-tuite-no
    Mr. Fat   TOP Mr. Thin   D self about

    uta   o utai-mas-u.
    song A sing-POL-PRS

    'Mr. Fat sings Mr. Thin a song about self.'

30. Yaseccho-san wa Hutoccho-san ni jibun ni tsuite no
    uta o utaimasu.

APPENDIX C EXPERIMENTAL SENTENCES FOR THE SECOND STUDY

1. Hutoccho-san **wa** Yaseccho-san ga **jibun** o nur-u
   Mr.Fat   TOP Mr.Thin   N self   A paint-PRS

   to   omoi-mas-u.
   COMP think-POL-PRS

   'Mr. Fat thinks that Mr. Thin paints self.'

2. Yaseccho-san wa Hutoccho-san ga jibun o nur-u
   to omoi-mas-u.

3. Hutoccho-san wa   Yaseccho-san ga jibun o
   Mr. Fat   TOP   Mr.Thin   N   self   A

   nur-u-daroo   to   ii-mas-u.
   paint-PRS-probably COMP say-POL-PRS

   'Mr. Fat says that Mr. Thin probably paints self.'

4. Yaseccho-san wa Hutoccho-san ga jibun o
   nur-u-daroo to ii-mas-u.

5. Hutoccho-san wa   Yaseccho-san ga jibun o nur-u
   Mr. Fat   TOP   Mr. Thin   N   self   A paint-PRS

   koto   o shit-te   i-mas-u.
   COMP A know-GER exist-POL-PRS

   Mr. Fat knows that Mr. Thin paints self.'

6. Yaseccho-san wa Hutoccho-san ga jibun o nur-u
   koto o shit-te i-mas-u.

7. Hutoccho-san wa   Yaseccho-san ga jibun o nur-u
   Mr. Fat   TOP   Mr. Thin   N   self   A paint-PRS

   koto   o kitaisi-mas-u.
   COMP A expect-POL-PRS

   'Mr. Fat expects that Mr. Thin paints self.'

8. Yaseccho-san wa Hutoccho-san ga jibun o nur-u
   koto o kitai si-mas-u.

9. Hutoccho-san wa   Yaseccho-san ni jibun o nur-u
   Mr. Fat   TOP   Mr. Thin   D   self   A paint-PRS

   yoo-ni   kitaisi-mas-u.
   COMP   expect-POL-PRS

   'Mr. Fat expects that Mr. Thin paints self.'

10. Yaseccho-san wa Hutoccho-san ni jibun o nur-u
    yoo ni kitai si-mas-u.

11. Hutoccho-san   wa   Yaseccho-san   ni   jibun   o   nur-u
    Mr. Fat   TOP   Mr. Thin   D   self   A   paint-PRS

    yoo-ni   tanomi-mas-u.
    COMP   ask-POL-PRS

    'Mr. Fat asks that Mr. Thin paints self.'

12. Yaseccho-san wa Hutoccho-san ni jibun o nur-u
    yoo ni tanomi-mas-u.

13. Hutoccho-san   wa   Yaseccho-san   ni   jibun   o   nur-u
    Mr. Fat   TOP   Mr. Thin   D   self   A   paint-PRS

    yoo-ni   ii-mas-u.
    COMP   say-POL-PRS

    'Mr. Fat says that Mr. Thin paints self.'

14. Yaseccho-san wa Hutoccho-san ni jibun o nur-u
    yoo ni ii-mas-u.

15. Hutoccho-san   wa   Yaseccho-san   ni   jibun   o   nut-te
    Mr. Fat   TOP   Mr. Thin   D   self   A   paint-PRS

    hoshii no   des-u.
    want   COMP   be-PRS

    '(It) is that Mr. Fat wants Mr. Thin paints self.'

16. Yaseccho-san wa Hutoccho-san id jibun o nut-te
    hoshii no des-u.

APPENDIX D   SAMPLE OF EXPERIMENTAL PACKET

QUESTIONNAIRE

PLEASE WRITE ALL YOUR RESPONSES/ANSWERS IN YOUR ANSWER SHEETS.
PLEASE DO NOT WRITE/MARK ANYTHING IN THIS PACKET SINCE OTHER
PEOPLE WILL USE THIS. THANK YOU VERY MUCH.

1. Please circle the following FORM TYPE of this questionnaire packet in the answer sheet.

    FORM TYPE   FORM 3

2. Sex

3. Age

4. Native Language

5. What is the name of the area where your dialect is spoken? If you speak more than one dialect, please rank them. 1 indicates the strongest.

6. What are your second languages?

7. How old were you when you started to lean the second languages?

8. How long in total did you study your second languages?
    use
9. How long was it that you study the languages in the classroom setting?

10. Have you spent any time in the country where your second languages are spoken? If so, please state why you were there and when you were there.

11. Have you taken any Japanese proficiency test? If yes, please indicate what lest it was, when you took it, and what your score/grade was.

Directions: (25 min · Time yourself and stop in 25 minutes)

1. Read the passage quickly to get the general meaning.
2. Write only one word in each blank in the passage. You can write your answer either in the English alphabet or in kana.
3. Check your answers.

NOTE: Spelling will not count against you as long as the scorer can read the word.

EXAMPLE:
Kinoo Nihongo no hon o kaimashita.
きのう にほんご の ほん (1) を___ かいました。

· Ari no gyooretsu
蟻 の 行列 （An Ant Trail）

Natsu ni naru to niwa no sumi nado de, ari no gyooretsu o yoku mikakemasu. Sono gyooretsu wa,
夏 に なると、庭 の 隅 など で、蟻 の 行列 を よく 見かけます。その 行列 は、

ari no su kara esa no aru tokoro made zutto tsuzuite imasu. Ari wa mono ga yoku
蟻 の 巣 から 餌 の ある ところ まで、ずっと 続いて います。蟻 は、物 が よく

miemasen. na noni, naze, ari no gyooretsu dekiru no
見えません。(1)_____ なのに、なぜ、蟻 の 行列 (2)_____ できる の

deshoo ka.
でしょうか。

Amerika ni, Uiruson iu gakusha ga imasu. Kono hito
アメリカ に、ウイルソン (3)_____ いう 学者 が います。この 人 (4)_____.

tsugi no yoo ni shite ari yoosu o kansatsushimashita.
次 の ように して、蟻 (5)_____ 様子 を 観察しました。

Hajime ni ari su kara sukoshi hanareta tokoro ni, no satoo
はじめ に、蟻 (6)_____ 巣 から 少し 離れた 所 に、(7)_____ の 砂糖

o okimashita. Shibaraku suru ippiki no ari ga, sono satoo
を 置きました。しばらく する (8)_____、一匹 の 蟻 が、その 砂糖

mitsukemashita. Kore wa, esa o sagasu soto ni dete ita
(9)_____ 見つけました。これ は、餌 を 探す (10)_____ 外 に 出て いた

hatarakiari desu. wa, yagate su ni kaette ikimashita.
働き蟻 です。(11)_____ は、やがて 巣 に 帰って いきました。(12)_____.

su no naka kara, takusan no ga tsugitsugi to dete kimashita. Sooshite,
巣 の 中 から、たくさん の (13)_____ が つぎつぎ と 出て 来ました。そして、

o tsukutte satoo no tokoro made Fushigi na koto ni, sono
(14)_____ を 作って 砂糖 の 所 まで (15)_____。不思議な こと に、その

gyooretsu wa, no ari ga su ni kaeru ni tootta michi kara
行列 は、(16)_____ の 蟻 が 巣 に 帰る (17)_____ に 通った 道 から

hazurete inai desu.
はずれて いない (18)_____ です。

Tsugi ni, kono michi ni ishi o, oite, ari no yukute
次 に、この 道 に (19)_____ 石 を、置いて、蟻 の 行く手 (20)_____

saegitte mimashita. Suruto, ari no gyooretsu ishi no tokoro de midarete,
さえぎって みました。すると、蟻 の 行列 (21)_____ 石 の 所 で 乱れて、

chirijiri natte shimaimashita. Yooyaku, ippiki no ari
散り散り (22)_____ なって しまいました。ようやく、一匹 の 蟻 (23)_____.

ishi no mukoo gawa no michi　　　　　　tuzuki o mitsukemashita. Soshite, sato ni
石 の 向こう 側 の 道 (24)＿＿＿＿＿＿つづき を 見つけました。そして、砂糖 に

susunde ikimashita. Sono uchi ni, hoka　　　　　　aritachi mo
(25)＿＿＿＿＿＿進んで 行きました。その うち に、ほか (26)＿＿＿＿＿＿ ありたち も、

ippiki nihiki to michi　　　　　　mitsukete arukidashimashita. Mata, dandan ni, ari
一匹 二匹 と 道 (27)＿＿＿＿＿＿見つけて 歩きだしました。また、だんだん に、蟻

gyooretsu ga dekite ikimashita. Mokutekichi ni　　　　　　to, ari wa,
(28)＿＿＿＿＿＿行列 が できて いきました。目的地 に (29)＿＿＿＿＿＿ と、蟻 は、

sato no tsubu　　　　　　motte, su ni kaette ikimashita. Kaeru　　　　　　mo,
砂糖 の 粒 (30)＿＿＿＿＿＿もって、巣 に 帰って 行ました。帰る (31)＿＿＿＿＿＿ も、

ari no michi wa kawarimasen.　　　　　　no gyooretsu wa, sato no katamari
蟻 の 道 は 変わりません。(32)＿＿＿＿＿＿ の 行列 は、砂糖 の 塊 (33)＿＿＿＿＿＿

nakunaru made tsuzukimashita.
無くなる まで 続ました。

　Korera no kansatsu　　　　　　、Uiruson wa, hatarakiari ga jimen ni
　これら の 観察 (34)＿＿＿＿＿＿、ウイルソン は、働き蟻 が 地面 に (35)＿＿＿＿＿＿

ka michishirube ni naru mono o　　　　　　oita no de wa nai　　　　　　to
か 道しるべ に なる もの を (36)＿＿＿＿＿＿おいた の で は ない (37)＿＿＿＿＿＿と

kangaemashita. Sokode, Uiruson wa, ari　　　　　　karada no shikumi o komaka ni
考えました。そこで、ウイルソン は、蟻 (38)＿＿＿＿＿＿からだ の 仕組 を 細かに

kenkyuushite　　　　　　. Suruto, ari wa, oshiri no tokoro　　　　　　tokubetsu no
研究して (39)＿＿＿＿＿＿！、すると、蟻 は、おしり の ところ (40)＿＿＿＿＿＿、特別 の

eki o dasu koto　　　　　　wakarimashita. Sore wa, nioi no aru,
液 を 出す こと (41)＿＿＿＿＿＿わかりました。それ は、におい の ある、

　　　　　　eki desu.
(42)＿＿＿＿＿＿液 です。

　Kono kenkyuu kara, Uiruson　　　　　　, ari no gyooretsu no dekiru wake
　この 研究 から、ウイルソン (43)＿＿＿＿＿＿、蟻 の 行列 の できる わけ

shiru koto ga dekimashita.
(44)＿＿＿＿＿＿知る こと が できました。

Hatarakiari wa,　　　　　　o mitsukeru to, michishirube to shite,　　　　　　ni
働き蟻 は、(45)＿＿＿＿＿＿を 見つける と、道しるべ と して、(46)＿＿＿＿＿＿に

kono eki o tuke nagara　　　　　　no desu. Hoka no hatarakiaritachi wa,
この 液 を つけ ながら (47)＿＿＿＿＿＿の です。ほか の 働き蟻たち は、

　　　　　　nioi o kaide, nioi ni sotte　　　　　　ikimasu. Soshite,
(48)＿＿＿＿＿＿におい を かいで、におい に そって (49)＿＿＿＿＿＿行ます。そして、

sono hatarakiaritachi mo, esa　　　　　　motte kaeru toki ni, onaji yoo ni eki
その 働き蟻たち も、えさ (50)＿＿＿＿＿＿持って 帰る とき に、同じ ように 液

o jimen ni tuke nagara aruku no desu. Sono tame, esa ga ooi hodo, nioi ga tsuyoku
を 地面 に つけ ながら 歩く の です。その ため、えさ が 多い ほど、におい が 強く

narimasu. Kono yoo ni, nioi o tadotte esa no tokoro e ittari, su ni kaettari
なります。このように、におい を たどって えさ の 所 へ 行ったり、巣 に 帰ったり

suru node, ari no gyooretsu ga dekiru to iu wake desu. (Owari)
する ので、蟻 の 行列 が できる という わけ です。(おわり)

Please look over the following word list for 2 minutes.
Also, please circle the numbers of the words you did not already know.

日本語(NIHONGO)	英語(ENGLISH)
(1) 自分(じぶん) *ji-bu-n*	(him)self
(2) 塗る(ぬる) *nu-ru*	to paint
(3) 思います(おもいます) *o-mo-i-ma-su*	to think
(4) 言います(いいます) *i-i-ma-su*	to say, tell
(5) 知っています(しっています) *shi-tte—imasu*	to know
(6) 期待します(きたいします) *ki-ta-i-shi-ma-su*	to expect
(7) 頼みます(たのみます) *ta-no-mi-ma-su*	to ask
(8) 欲しいのです(ほしいのです) *ho-shii no de su*	to want to
(9) 写真(しゃしん) *sha—shin*	photograph
(10) 見せます(みせます) *mi-se-ma-su*	to show
(11) あげます *a-ge-ma-su*	to give
(12) 質問(しつもん) *shi-tsu-mon*	question
(13) 話(はなし) *hanashi*	story
(14) 持ってきます(もってきます) *motte kimasu*	to bring
(15) 読みます(よみます) *yomi-ma-su*	read
(16) 歌(うた) *u-ta*	song
(17) 歌います(うたいます) *u-ta-i-ma-su*	to sing

'04

DIRECTIONS

On each page you will find a Japanese sentence, two pictures, three answer options, and a scale of certainty about your answer choice. We want you to read the sentence and tell us the possible meaning(s) of the sentence by picking a picture or pictures. After that, please indicate how certain you are about your answer choice.

What we mean by "the possible meaning(s)" is that a sentence can have one or more meanings. For example, the sentence 'Flying airplanes can be dangerous' has two possible meanings. One is 'Airplanes flying in the sky can be dangerous' and the other is 'Piloting airplanes can be dangerous.' Of course, there are many sentences which have only one possible meaning, too. We would like to know how you feel about the possible meanings of the sentences in this questionnaire.

For each sentence, please tell us its possible meaning(s) by picking one of the two pictures provided ([1] picture A or [2] picture B, or [3] both pictures). Also, tell us how certain you are about your answer by selecting one of the three choices: [1] certain, [2] not certain, but you think this is the answer, and [3] not certain, so you just guessed.

Read each sentence carefully before you answer and think of its possible meaning(s) in Japanese. Please think in Japanese and do not translate. Concentrate on what "jibun/himself" in each sentence refers to. Please mark only one answer for each sentence. Make sure you have answered all 30 questions.

Example question: Read the following sentence and tell us its possible meaning by picking the picture(s). (Circle the number of your answer.)

フトッチョさんはヤセッチョさんに花をあげました。
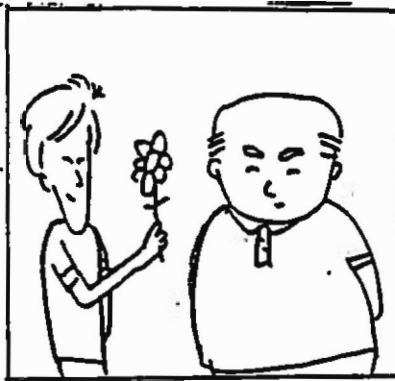
Answer: [1] Picture A   [2] Picture B   [3] Both A and B

How certain?: [1] Certain   [2] Not certain, but you think or   [3] Not certain, so
                              feel that this is the answer   you just guessed

1. ヤセッチョさんはフトッチョさんが自分を塗ることを知っています。

Mr. Thin wa Mr. Fat ga jibun o nuru koto o shitte imasu.
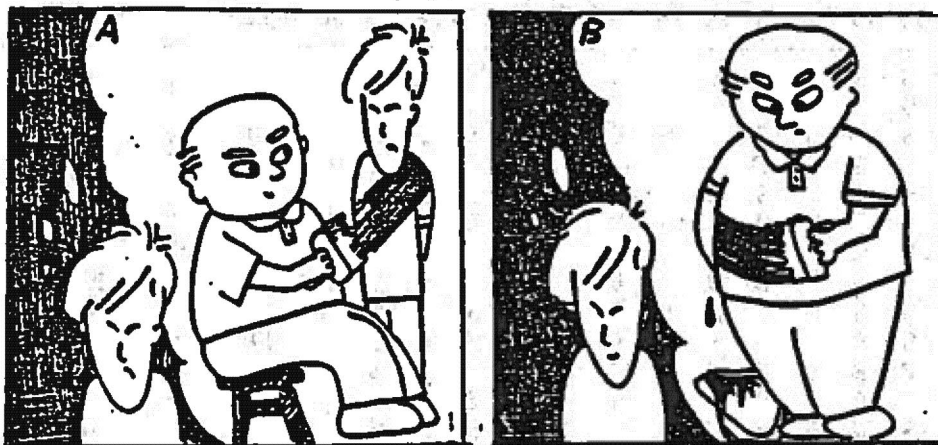
Answer: [1] Picture A. [2] Picture B. [3] Both A and B

How certain?: [1] Certain. [2] Not certain, but you think or feel that this is the answer. [3] Not certain, so you just guessed.

2. フトッチョさんはヤセッチョさんに自分の写真を見せます。

Mr. Fat wa Mr. Thin ni jibun no shashin o misemasu.

Answer: 111 Picture A. [2] Picture B. 131 Both A and B

How certain?: [1] Certain. [2] Not certain, but you think or feel that this is the answer. [3] Not certain, so you just guessed.

03

APPENDIX E DETAILED DATA FOR THE FIRST STUDY

Table 38
Detailed Data: Individual Subject x Sentence

#	17	18	19	20	21	22	23	24	25	26	27	28	29	30	S(L2)	O	B(L1)
1	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
2	S	S	S	S	O	O	S	S	S	S	S	S	S	S	12	2	0
3	O	S	O	S	S	S	S	O	S	S	S	S	S	O	10	4	0
4	S	S	S	S	O	S	S	O	S	S	S	0	5	0	. 1 0	4	0
5	S	S	S	S	S	B	O	S	S	S	S	S	S	S	12	1	1
6	S	B	S	S	S	S	S	B	S	S	B	B	S	S	10	0	4
7	B	B	B	B	S	S	B	S	S	B	S	S	S	S	8	0	6
8	S	B	B	B	B	B	B	B	B	B	B	B	B	B	1	0	13
9	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
10	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
11	B	B	B	B	B	B	S	S	B	B	B	B	B	B	2	0	12
12	B	B	B	B	B	B	S	S	B	B	B	B	B	B	2	0	12
13	O	S	B	B	B	O	S	S	B	S	S	S	S	S	8	2	4
14	S	S	S	B	O	O	S	S	S	S	S	S	S	O	10	3	1
15	B	B	B	B	B	B	S	S	S	S	S	B	S	S	7	0	7
16	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
17	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
18	S	S	B	O	O	S	O	S	O	O	B	S	S	S	12	1	1
19	B	B	B	B	B	B	B	B	B	B	O	B	S	S	7	5	2
20	S	S	S	S	O	O	O	O	S	S	S	S	O	S	2	1	11
21	O	S	B	S	S	O	S	B	O	O	O	S	O	S	9	5	0
22	S	S	S	S	S	S	S	S	S	S	S	S	S	S	6	6	2
23	B	S	S	S	B	B	B	B	S	S	B	B	B	B	14	0	0
24	B	B	B	B	S	B	S	S	B	B	B	B	B	B	5	0	9
25	S	S	S	S	S	S	S	S	S	S	S	O	S	S	3	0	11
26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	13	1	0
27	S	B	O	S	S	O	S	S	S	B	O	O	S	O	0	0	14
28	S	S	S	S	O	O	O	B	S	S	B	S	B		7	5	2
29	B	S	S	B	S	O	S	S	B	S	S	B	B	B	8	3	3
30	S	S	S	S	S	S	S	S	S	S	S	S	S	B	8	1	5
31	S	S	S	S	S	S	S	S	S	B	S	S	S	S	13	0	1
32	S	S	S	S	O	O	S	S	S	S	S	S	S	S	13	1	0
33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0	0	14
34	S	S	S	S	S	B	S	S	S	O	S	S	S	S	12	1	1
35	S	B	S	B	B	B	S	B	B	S	B	B	B	B	4	0	10
36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0	0	14
37	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
38	B	B	B	B	B	B	S	S	B	B	O	B	O		2	2	10
39	S	S	S	S	O	S	S	S	S	S	S	S	S	S	13	1	0

Low: 1-16, Mid: 17-32, High: 33-48

Table 38. ——— (Continued) Detailed Data: Individual
Subject x Sentence

#	17	18	19	20	21	22	23	24	25	26	27	28	29	30	S(L2)	O	B(L1)
40	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
41	S	S	S	S	S	S	S	S	S	S	B	B	S	B	11	0	3
42	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
43	S	B	S	S	S	B	B	S	O	S	S	S	S	B	9	1	4
44	B	S	S	S	O	S	S	S	S	S	S	S	S	S	12	1	1
45	S	S	S	S	S	S	S	S	S	S	S	S	S	O	13	1	0
46	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
47	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0
48	S	S	S	S	S	S	S	S	S	S	S	S	S	S	14	0	0

Low: 1-16, Mid: 17-32, High: *33-48*

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Table 39
Detailed Data: Individual Sentence x Level

S#	Japanese L1			JSL (LOW)			JSL (MID)			JSL (HIGH)			English L1		
	S	O	B	S	O	B	S	O	B	S	O	B	S	O	B
17	12	2	2	10	2	4	10	1	5	12	0	4	8	1	7
18	15	0	1	10	0	6	12	0	4	11	0	5	4	1	11
19	15	0	1	9	1	6	10	1	5	13	0	3	5	0	11
20	15	1	0	9	0	7	11	1	4	12	0	4	5	0	11
21	12	0	4	8	3	5	9	4	3	10	2	4	2	5	9
22	12	1	3	8	3	5	6	6	4	10	0	6	1	6	9
23	16	0	0	13	1	2	10	3	3	13	0	3	9	0	7
24	15	1	0	12	2	2	10	1	5	13	0	3	10	0	6
25	16	0	0	12	0	4	10	2	4	11	1	4	6	0	10
26	16	0	0	12	0	4	9	2	5	12	1	3	6	0	10
27	14	0	2	12	0	4	9	3	4	11	0	5	7	0	9
28	15	0	1	10	1	5	9	2	5	11	1	4	3	1	12
29	15	0	1	13	0	3	10	2	4	12	0	4	8	0	8
30	15	0	1	10	3	3	9	1	6	9	2	5	7	0	9

S(ubject), O(bject), B(oth)
L1 setting: Both
L2 setting: Subject

APPENDIX F DETAILED DATA FOR THE SECOND STUDY

Table 40
Detailed Data: Individual Subject x Sentence

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	N	L(L1)	B(L2)
1	L	L	L	L	L	L	L	L	B	N	B	N	L	B	B	L	2	10	4
2	L	L	L	L	L	N	L	L	L	L	B	N	L	B	N	L	3	11	2
3	L	L	N	N	L	N	L	N	L	N	N	L	L	N	N	L	8	8	0
4	L	L	L	L	L	L	L	L	N	L	L	L	L	L	L	L	1	15	0
5	L	L	L	L	L	L	L	L	B	N	N	N	L	L	N	N	5	10	1
6	N	B	N	B	B	N	L	L	L	B	B	N	L	B	L	L	4	6	6
7	B	N	B	B	B	B	B	N	B	B	N	B	N	L	B	N	5	1	10
8	L	L	L	B	L	L	L	L	B	L	B	B	L	L	B	B	0	10	6
9	L	L	L	L	L	L	L	L	N	N	N	N	N	N	L	N	7	9	0
10	L	L	L	L	L	L	L	B	L	L	N	B	B	L	N	N	3	10	3
11	L	L	L	L	L	L	L	L	L	B	B	B	B	L	B	B	0	10	6
12	L	L	L	L	L	L	L	L	L	B	L	B	B	L	B	B	0	12	4
13	B	L	L	L	B	L	L	N	L	L	L	L	L	L	L	N	2	12	2
14	L	L	L	L	L	L	L	L	L	L	N	L	L	L	L	L	1	15	0
15	L	L	L	L	L	L	L	L	L	N	L	L	N	N	N	L	4	12	0
16	L	L	L	L	L	L	L	L	L	L	L	L	B	L	N	N	3	12	1
17	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	0	16	0
18	L	L	L	L	L	L	L	N	L	B	N	N	N	L	B	L	4	10	2
19	L	B	L	B	L	L	N	L	L	N	N	N	B	B	L	L	4	8	4
20	L	L	L	L	L	L	L	L	L	N	L	N	N	L	L	L	3	13	0
21	L	N	B	N	N	L	L	N	L	B	L	L	L	N	N	N	7	7	2
22	B	B	B	B	B	B	B	B	B	N	N	B	B	N	B	B	3	0	13
23	B	L	L	N	L	L	L	N	L	L	N	N	L	B	N	L	5	9	2
24	L	L	L	L	L	L	L	L	L	L	L	L	B	B	B	L	0	14	2
25	L	L	L	L	L	L	N	L	N	N	B	L	N	N	N	B	6	8	2
26	L	L	L	L	L	L	L	L	B	B	L	B	B	B	B	B	0	9	7
27	L	N	N	M	L	L	L	N	N	L	L	N	L	B	N	L	7	8	1
28	L	L	L	L	L	B	L	L	N	N	B	N	L	L	N	N	5	9	2
29	L	B	L	L	L	L	L	L	N	B	L	B	L	L	N	N	3	10	3
30	L	B	L	B	B	B	L	B	N	N	L	L	L	L	N	N	4	7	5
31	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	0	16	0
32	B	L	L	L	L	L	N	L	L	L	N	L	L	L	L	L	1	14	1
33	L	L	L	L	L	L	L	N	N	N	N	N	N	N	N	N	9	7	0
34	L	L	L	L	L	L	L	L	L	N	N	B	B	B	N	N	4	9	3
35	B	B	B	N	B	B	N	B	B	N	B	B	B	N	B	N	5	0	11
36	B	B	L	L	B	B	B	B	N	N	B	B	B	B	N	N	4	2	10
37	B	B	B	B	L	B	B	B	B	B	B	B	N	B	L	B	1	2	13
38	B	L	L	L	L	L	L	L	L	B	B	B	B	B	B	B	0	8	8
39	L	L	L	L	L	L	L	L	B	L	L	B	L	B	B	N	1	11	4

Low: 1-16, Mid: 17-32, High: 33-48

Table 40
(Continued) Detailed Data: Individual Subject × Sentence

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	N	L(L1)	B(L2)
40	L	L	L	L	L	L	L	L	N	N	N	N	L	N	L	N	6	10	0
41	L	L	L	L	L	L	L	L	B	B	B	B	L	L	L	B	0	11	5
42	B	L	L	L	L	B	L	B	N	N	N	N	N	L	B	N	6	6	4
43	B	L	L	L	B	L	L	B	N	N	N	B	B	N	L	N	5	6	5
44	B	B	L	L	L	L	L	L		L	N	N	B	L	B	B	2	9	5
45	L	N	B	B	B	L	L	B	B	B	L	B	B	B	B	B	1	4	11
46	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	N	1	15	0
47	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	0	0	16
48	L	L	L	B	L	L	L	B	B	B	N	B	B	N	N	N	4	6	6

Low: 1-16, Mid: 17-32, High: 33-48

Table 41

Detailed Data: Individual Sentence x Level

S#	Japanese L1			JSL (LOW)			JSL (MID)			JSL (HIGH)			English L1		
	NL	LC	B	NL	LC	B	NL	LC	B	NL	LC	B	NL	LC	B
1	6	1	9	1	13	2	0	13	3	0	8	8	0	15	1
2	2	5	9	1	14	1	2	10	4	1	10	5	0	15	1
3	4	3	9	2	13	1	1	13	2	0	12	4	1	14	1
4	3	3	10	1	12	3	3	10	3	1	11	4	0	15	1
5	2	4	10	0	13	3	1	13	2	0	11	5	0	15	1
6	1	6	9	3	12	1	0	13	3	0	11	5	0	15	1
7	2	3	11	0	15	1	2	13	1	1	12	3	0	16	0
8	3	2	11	3	12	1	4	10	2	1	7	8	0	15	1
9	6	2	8	3	9	4	6	8	2	5	4	7	0	15	1
10	5	0	11	5	7	4	5	7	4	7	3	6	0	14	2
11	6	1	9	5	6	5	6	8	2	7	3	6	1	13	2
12	8	0	8	6	5	5	6	7	3	4	1	11	0	15	1
13	3	2	11	2	10	4	2	10	4	3	4	9	0	15	1
14	1	1	14	3	10	3	3	8	5	5	4	7	0	15	1
15	10	0	6	6	5	5	7	6	3	4	5	7	0	14	2
16	11	0	5	6	7	3	4	9	3	10	0	6	0	15	1

N(on)L(ocal), L(o)C(al), B(oth)
L1 setting: Local
L2 setting: Both

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