

The Process of Article Acquisition by Japanese Learners of English as a Foreign Language: A Longitudinal Investigation¹

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1. Introduction

It is quite well-known that the article system is one of the toughest aspects of English grammar for non-native speakers to acquire and tends to remain problematic even among advanced-level learners (Mizuno, 2000). This learning problem with English articles appears to confront learners like Japanese, who do not possess an equivalent system in their native language even more seriously (Oller & Redding, 1971; Larsen-Freeman, 1975; Master, 1988). The complexity of a system constrained not only by the lexical properties of the modified noun (e.g., count/non-count distinctions) but also by the semantic/informational status of the noun in discourse (e.g., specificity, hearer's/reader's knowledge) makes it almost impossible for non-native learners to consciously distinguish the right rule among a variety of operational rules at every moment of use. Moreover, formal rules described in grammar books often fail to account for native speakers' actual usage of articles in natural discourse. Decisions on the appropriate choice of articles in context are likely to be unstable even among native

speakers due to their variable perceptions of 'context' itself and intuitive judgment on noun countability (Kim Yoon, 1993).

The overall objective of the present study is to account for the gradual process of acquisition of the article system by Japanese college students of English as a foreign language (EFL hereafter)—how Japanese students studying EFL only in Japan tackle this complicated system and come to manipulate it more efficiently through the course of learning.² The term "process" here presupposes the validity of the so-called Interlanguage Hypothesis (Selinker, 1972), which argues as one of its core properties that the second language learner's language (i.e., interlanguage [IL hereafter]) evolves or approximates toward the native speaker's norms not randomly but more or less in a systematic, uniform fashion. It has been empirically proved in a number of studies that the process of second language acquisition (SLA hereafter) consists of certain dimensions that are shared by the learners of a single target language (and even by second language learners of different target languages in general) as well as those that belong to the learners of a specific native language (i.e., L1 transfer). The process of SLA is also characterized as a relatively homogeneous internal process of "creative construction" (Brown, 1994: 65), in which IL dynamically evolves based on the outcome of the learner's consistent hypothesis-testing and remains permeable to subsequent amendments throughout learning (Ellis, 1985).

The present longitudinal investigation begins with re-examination of these claims about IL development by taking a closer look at the actual growth of EFL learners over an extensive period of time. There are two benefits from doing this. First, the present study

examines the validity of prior theories from an EFL perspective. A review of past studies of ESL article acquisition (and ESL research in general) reveals that the framework of investigation does not tend to explicitly differentiate between second-language (ESL hereafter) and foreign-language contexts of learning. SLA theories (focused on English IL) constructed thus far are based predominantly on ESL learning environments. It is quite problematic to simply expect the ESL-based theories to account for what is happening in the EFL learning environment as well (Ellis, 1985). Serious empirical investigation is required to grasp to what extent the ESL-based theories may be valid and generalizable for identical phenomena in the EFL learning environment.

Second, theories on the process of SLA require more empirical justifications based on diachronic investigation. A review of literature suggests that a great majority of past studies of ESL/EFL article acquisition are cross-sectional in research design, and only a few longitudinal studies have been done (Gass & Selinker, 1994). In the former approach, the process of article acquisition typically needs to be deciphered from comparisons of 'group data' coming from groups of learners at different proficiency levels. Some researchers, however, are cautious not to overgeneralize the paths of SLA that are likely to be variable due to the learning background of individual learners, and even point out a possibility that uniformity of SLA may be a methodological artifact (e.g., Huebner, 1985). In any case, in the ESL environment where learners' exposure to the target language (TL hereafter) is natural and thus relatively uniform, grouping the learners based on their proficiency levels for research purposes may be a convenient research technique whose empirical

foundation has long been subject to scrutiny in SLA research in general. But I strongly suspect the validity of this cross-sectional technique when it is applied to such restricted learning environments as EFL, where individual learners differ significantly in terms of their exposure to TL input and interaction both inside and outside the classroom and where the process of teaching is also likely to vary among teachers (Spada, 1986).

Thus, I believe that a productive approach would be to begin the present investigation by questioning the 'uniformity' principle of IL development in the EFL context and focusing more on the dimension of 'creative construction' that I hypothesize would take quite different forms across individual learners. The present longitudinal study of EFL article acquisition is designed to test this hypothesis and re-examine the principles of English IL development from the EFL perspective. I believe that this research orientation will eventually contribute to constructing more legitimate theories of SLA sensitive to the gaps between the distinctive learning environments.

Other major thrusts of the present study lie in its analytical framework of variationist linguistics and its strong focus on the learner's performance data in naturalistic context for EFL communication. As the analytical framework, the present study applies the fundamental principle of variationist linguistics (Labov, 1972) to the context of EFL, as explored by a number of studies done exclusively in an ESL context (Dickerson, 1975; Odlin, 1978; Tarone, 1982, 1983, 1985; Wolfram, 1985; Adamson, 1988; Young, 1988; Preston, 1989; Bayley & Preston, 1996). Language inherently involves systematic variability (Weinreich, Labov, & Herzog, 1968;

Labov, 1969), which has also been found to be an essential component of the developmental process of IL (Ellis, 1985, 1994). Language (and IL) as a heterogeneous system of rules consists of structured, rule-governed variations under the influence of various linguistic and extra-linguistic (e.g., social, stylistic) factors (Preston, 1989). Given a particular grammatical feature that is observed as being variable in language use (e.g., article usage as the dependent variable in this study), the systematicity underlying that observed variability stems from the intersecting relationships among a number of potential constraints (i.e., independent variables) that simultaneously affect the variable production of the dependent variable. While prior studies of ESL/EFL article acquisition are concerned only with one-to-one correlation between article usage and some potential factor that is assumed to influence the usage (e.g., functions of articles in discourse such as anaphoric, generic, etc.), the present study sheds fair light on the intersecting effects of a number of potential factors that may simultaneously affect the learner's variable production, as was first attempted in Young (1996). Such interfactor relations in terms of effectiveness on variable uses of articles and their diachronic changes throughout learning become the key to understanding the process of article acquisition.

A variationist linguistics approach also enables us to account for the underlying mechanism of observed variations based on the speaker's natural linguistic performance as analytical data (Cedergren & Sankoff, 1974). A review of past studies, however, indicates that the data elicitation tasks adopted in a great majority of EFL studies are quite controlled or receptive (see Section 2). Very few studies have extensively analyzed performance data from naturalistic IL

production, while IL performance has been found to be full of strategies the learner autonomously creates (Brown, 1994). As the prime source for directly observing such strategic aspects, the present study closely examines the learner's actual performance in naturalistic environments. The longitudinal nature of this study has made it possible to elicit a large volume of naturalistic data from the same individuals even in such a restricted learning situation as the EFL context.

2. Past Studies of Acquisition of Articles in English Interlanguage

In this section, I will review the relevant literature of article acquisition in English IL with two specific foci: 1) the 'universal' route or process of development of the article system in English IL and 2) the outcome of past EFL-based studies of article acquisition, mainly by Japanese learners of EFL. The first focus of the review stems exclusively from the studies conducted in the ESL learning environment. The second focus will then discuss both shared and discrepant aspects of prior research outcome in the two learning situations.

One of the robust findings of the universal process of article acquisition in English IL is linked to the notions of semantic reference and participant knowledge: specificity of referents and the hearer's (or reader's) levels of knowledge in discourse (Bickerton, 1981). The former property stems from a universal notion of noun phrase reference. Any noun phrase (NP) refers to either a specific (+SR [specific referent]) or a non-specific (-SR) entity in discourse. The

latter is a discourse universal, which presupposes that the speaker/writer indicates whether the referent of an NP is assumed to be known (+HK [hearer-known]) or unknown (-HK) to the hearer/reader in the context of discourse. It follows that the distributional patterns of articles in English (i.e., “the,” “a/n,” zero marking) are determined by the following four-way combinations of these universal features (Table 1):

TABLE 1

Four-way Combinations and Types of Articles Chosen in Standard English

| Combinations | Types | Articles | Examples |
|--------------|--|-------------------------------|--|
| -SR, +HK | • Generic | a/n, the, ϕ | <u>The/A</u> lion is a beautiful animal. ϕ Lions are beautiful animals. |
| +SR, +HK | • Unique referent; • Referent physically present; • Referent previously mentioned in the discourse; • Specific referent assumed known to the hearer/reader | the | <u>The</u> Pope Ask <u>the</u> guy over there. A: So he married a woman from England. B: Yes, <u>the</u> woman's from London. He went over to <u>the</u> book store. |
| +SR, -HK | • First mention in a discourse of [+SR] NP which is assumed not known to the hearer/reader; • First mention of [+SR] NP following existential <i>have</i> or <i>there is/are</i> and assumed not known to the hearer/reader | a/n, ϕ | Dad gave me <u>a</u> car. Our house has <u>a</u> garage. There is a lake called Shikotsu. |
| -SR, -HK | • Equative NPs; • NPs in the scope of negation; • NPs in the scope of interrogative; • NPs in irrealis scope | a/n, ϕ | He's <u>a</u> nice man. I don't see <u>a</u> pencil. Do you see <u>a</u> pencil? If I had a million dollars, I'd buy <u>a</u> big yacht. |

(adapted from Tarone & Parrish, 1988: 27)

Prior studies of spoken data in ESL have shown that the process of English article acquisition is systematic in terms of the types of articles mastered and involves a more or less uniform path across learners of different native language backgrounds. It has consistently been found in a number of ESL-based studies that the definite article (DA hereafter) is more likely to be produced correctly than either the indefinite article (IA hereafter) or zero marking, and thus is considered to be acquired first of the three (Hakuta, 1976; Parrish, 1987; Master, 1987; Thomas, 1989).

Interpretations of this general finding, however, significantly vary among researchers. Above all, which of the universal categories—[+SR] or [+HK]—would operate in the earlier acquisition of DA is still highly debatable. On one hand, the earlier acquisition of 'the' is associated with the [+HK] feature on the basis of research evidence that the use of 'the' with [+SR, +HK] and [-SR, +HK] remained intact throughout a 1-year-long observation of an adult Hmong speaker of ESL (Huebner, 1984). Master (1987), a cross-sectional study of 20 ESL students of five different native languages, also argues for that particular association because 'the' tended to be overproduced in the category ([-SR, +HK]), which is found even more salient in the production of learners whose native language has no article system. Other researchers attribute the earlier acquisition of DA to the primacy of [+/- SR] distinction over [+/- HK], providing universalistic accounts. In Parrish's (1987) 4-month-long study of a 19-year-old Japanese ESL learner, for example, the claim is based on the learner's overgeneralization of 'the' in [+SR, -HK] (but not in [-SR, -HK]). A similar finding was obtained in Thomas (1989), who studied 30 adult learners of ESL cross-sectionally: the

learners tended to overgeneralize DA in first-mention contexts, namely, [+SR, -HK] NPs. This latter interpretation is parallel to the phenomena in L1 acquisition of English articles based on children's egocentricity (e.g., Cziko, 1986) and coincides with the Language Bioprogram Hypothesis (Bickerton, 1981), which proposes an innate sensitivity to specificity and non-specificity of reference.

Variable uses of IL articles cannot fully be accounted for by the afore-mentioned universalistic features alone. Other attributes of the noun modified by articles also appear to have something to do with the variable yet systematic uses of English IL articles. Parrish (1987) found some correlations between the types of semantic reference discussed above and the syntactic positions of the noun concerned. While it was observed at the initial stage of acquisition that zero marking typically occurred with [+SR][+HK] nouns in the subject position and DA with the identical type of nouns in the predicate position, this syntactic differentiation disappeared as acquisition proceeded. The learner's idiosyncratic associations of particular types of NPs (e.g., proper nouns, compounds, prefabricated phrases, etc.) with articles were also observed. Parrish interprets these results as the very evidence of the learner's 'creative construction' of her IL system and its ongoing revisions for achieving internal consistency. Kim Yoon (1993) also investigates a possible link between the indefinite vs. zero article choice and noun countability. Based on 27 Japanese ESL learners' intuitive judgment of the countability of nouns and cloze-test answers, she concludes that countability is directly associated with the use of IA and non-countability with zero marking (cf., Young, 1996; Lee, 1997).

The outcome of these studies suggests the necessity of a

multidimensional approach to variations in the use of English IL articles. Variable choice of particular articles appears to be affected simultaneously by a number of crosscutting factors besides the universal categories of the article system. The most comprehensive investigation done thus far from this perspective is Young's (1996) cross-sectional study. Based on interview data from two proficiency groups of 6 ESL adult learners with no articles in their native languages (3 Czech and 3 Slovak speakers), Young investigated variability in article usage as resulting from the relative effects of four independent factors that were hypothesized to affect article usage simultaneously: 1) the learner's level of proficiency, 2) NP types in terms of [+/-SR] and [+/-HK], 3) countability and number of the noun, and 4) first language transfer of the match/mismatch between information flow and word order (cf., Chaudron & Parker, 1990).

The results first demonstrate that accuracy in article usage is positively correlated with the learners' overall proficiency. Second, the learners' uses of both IA and DA become increasingly sensitive to discourse context as IL develops after an earlier stage of acquisition when the nonsystematic flooding of DA is observed. Similar to what is found in Parrish (1987), there is also a strong tendency to associate a single form with a single function (e.g., using not 'the' but zero marking or 'a/n' with generic nouns). The learners appear to creatively construct the rules of an IL grammar that differ from the native speaker's. Third, the learners at both proficiency levels can distinguish between singular and plural nouns by using IA and zero marking accordingly. Fourth, the learners' L1 patterns of marking new (rheme) and old (theme) information by word order weakly affect their choice of articles. Given that the learners' L1s

mark information status by word order (or clause position), there was a tendency for rhemes (i.e., new information) presented at the end of the clause to co-occur with zero marking. This particular success in IL performance was interpreted as first language transfer, in that the learners might be aware that the clause-final position is the site for new information in their L1s thus marking is redundant. Young's multi-dimensional approach succeeds in revealing the complexity of the IL learner's cognition of the constraints on article usage. It demonstrates that IL production is variable being affected simultaneously by a variety of constraints (as in L1 production), and implies that IL development is the approximation process to TL norms in which the learner gradually comes to figure out proper (i.e., target-like) combinations of constraints.

As compared with the outcome of these studies based primarily on a naturalistic learning environment (i.e., ESL), several studies that are conducted in strictly EFL learning environments provide other insights into our understanding of the process of SLA. These first two examples deal with beginning/intermediate-level learners of EFL. Administering two kinds of oral production tasks (i.e., response to questions and story-telling) to 31 Japanese high school students, Shirahata (1989) investigated their acquisition order of 9 EFL morphemes to test whether the obtained order matches the "natural order" that prior ESL studies have suggested (e.g., Krashen, 1977). Shirahata's results show that there are drastic discrepancies in the acquisition order of articles (and possessives) with the natural order. Shirahata attributes his finding that the usage of articles (and possessives) distorts the natural acquisition order to negative transfer from the learners' native language that has no article system, and

stresses that the acquisition of the article system in English IL consists of a mixture of both the universal dimension and the definitive effects of the learner's L1 that cannot be neglected.

Noguchi's (1997) study of 36 technical college students' EFL usage in two different types of tasks (perceptive task: multiple-choice test; productive task: translation test) produces results that are rather discrepant with prior studies.³ The results show that there is no salient gap in accuracy rates between DA and IA, which dramatically contradicts the generalization that DA is likely to be acquired earlier. Moreover, overgeneralizations of DA were not observed, again in discord with prior studies. Instead, his results demonstrated that overproduction of zero marking in the contexts of IA and DA was predominant. Noguchi interprets this as the consequence of the learners' avoidance of the articles whose operational rules may be felt difficult as well as transfer from their L1 that has no article system (Master, 1987). Errors made by the beginning level learners in this study were also illustrative of a typical performance strategy involving prefabricated patterns (Brown, 1994). The fact that IA was used even more frequently than DA is attributed to the learners' active uses of the existential structure and idiomatic expressions with many occurrences of 'a (n).' (cf., Thomas, 1989).

There are also some studies that deal with intermediate/advanced-level learners of EFL. These studies seem to be more comparable with ESL-based studies in terms of the learners' levels of proficiency. Kubota's (1994) study of 141 Japanese college students' EFL from two data elicitation tasks (a 5-minute fill-in-the-blank test and a 20-minute composition test) produces rather mixed results regarding the general principles of article acquisition in English IL. In accord

with a number of prior studies, there was observed a tendency for DA to be used more correctly than IA, but this was found to be true only on the fill-in-the-blank test. DA was also overproduced with first-mentioned NPs (i.e., the [+SR, -HK] feature) (in accord with Thomas [1989], for example), though it is left unanswered whether the overproduction stems from the learners' sensitivity to the [+/-SR] or to the [+/-HK] features. As for the combinations of the universal features, both types of tests show that the [+SR, +HK] NP (e.g., anaphoric) was easiest for the learners to acquire due to discourse cohesiveness and the [-SR, +HK] NP (e.g., generic) most difficult. The former in particular coincides with prior studies (Master, 1987). Perhaps of particular relevance to the present study is the longitudinal dimension of this study, which compared article usage in the current composition test with that in compositions written by 57 of the 141 participants a year before the experiment. His analysis, however, indicated that there was no improvement in article accuracy over the period of one year. Kubota suggests that this would continue to be the case without explicit formal instruction on article usage.

Yamada and Matsuura's (1982) cross-sectional study compared article usage in cloze-test production between two proficiency groups of 35 senior high (intermediate level group) and 35 college students (advanced level group) of EFL in Japan. They found a steady increase in correct usage of articles as proficiency becomes higher. Among the three types of articles, DA was used most correctly, and zero marking most incorrectly. This result coincides with the ESL-based finding that DA is acquired earlier than the others. In addition, the non-target-like 'flooding' of DA in both contexts of zero marking

and IA was also identified in accord with previous studies (Huebner, 1985; Master, 1987; Parrish, 1987; Thomas, 1989; Young, 1996). However, based on their observation that this flooding of 'the' was hardly amended even at the advanced level, Yamada and Matsuura (1982: 58-59) argue that both intermediate and advanced Japanese learners of EFL tend to "fossilize" the incorrect patterns while ironically the "over-specification strategy" resulted in their high score in the correct usage of DA. Given the fact that both groups of subjects face the same difficulty of using IA and zero marking appropriately, they further point out the importance of learning how to mark the "non-specificity" of nouns in Japanese learners' acquisition of EFL (p. 61).

Perhaps the largest scale error analysis study of EFL article acquisition by Japanese learners is Mizuno (2000), which administered a variety of both judgmental (e.g., multiple choice cloze test) and productive (e.g., controlled composition test) tests to 9 proficiency groups of learners made up of 353 senior high school and university students in Japan. Overall, the results show that there are systematic correlations between the learner's proficiency levels and 5 types of article errors. At relatively initial stages of acquisition, article errors are characteristic of ungrammatical concurrence with other determiners (e.g., a my book) (p. 51) and wrong word order involving articles (e.g., new a book) (p. 59). The remaining three types—omission errors, selection errors, and overproduction errors—tend to remain consistent throughout the process of learning. After the beginning level, omission errors begin to decrease in frequency as proficiency levels go up. Selection errors show a similar, though less pronounced, tendency. A consistently

high rate of overproduction errors in both intermediate and advanced level learners' IL performance especially indicates that Japanese learners of EFL continue to have difficulty in dealing with zero marking, which inherently accords with the claim put forth by Yamada and Matsuura (1982).

In contrast to ESL-based studies of article acquisition in general, a stronger research focus on surface-level constraints on variations in article usage is also characteristic of past studies of Japanese acquisition of articles in EFL. Mizuno (2000), for example, investigated systematic correlations with syntactic positions of the noun co-occurring with articles. He found that word order errors typically made by beginning-level learners tended to occur at the clause-final position. Omission errors tended to decrease at the clause initial position, whereas overproduction errors tended to be avoided when occurring with complement nouns right after the 'be' verbs (cf., Yamada, 1996).⁴

Both Yamada's (1996) 16-month-long study of EFL writing by 5 Japanese college students and Takahashi's (1997) cross-sectional study of two test results (a multiple choice cloze test and a multiple choice article insertion test) from 101 Japanese college students focused on internal structures of the noun phrase involving articles. Yamada found that the noun or noun phrase post-modified by such elements as prepositional phrases or relative clauses tended to be marked by DA (e.g., the clock tower *of the Independence Hall*; the stump *on which the raccoon dog had sat...*) (p.120). Takahashi, on the other hand, found that his subjects tended to produce articles more accurately when the noun was modified by a relative clause rather than by a prepositional phrase. In addition, he found that regardless

of whether they are relative clauses or prepositional phrases, the post-modifying elements tended to promote an inaccurate overproduction of DA in accord with Yamada's (1996) results.

Finally, Mizuno (2000) investigated systematic patterns of concurrence between the articles and other pre-modifiers, and found that the use of adjectives as the modifier of the noun was likely to hamper the correct usage of articles especially by beginning-level learners. Though the subjects are Korean EFL learners, Lee (1997) also found that the sequence of [article + adjective + noun] inhibited their production of articles more heavily than the sequence without adjectives.

The present study will adopt a multi-dimensional perspective of analysis that takes into account the variety of potential constraints that simultaneously affect IL learners' variable production of English articles. It will particularly investigate diachronic change in the matrix of the constraints that Japanese learners of EFL gradually construct over time.

3. The Present Study

3.1. Research questions

The present longitudinal study aims to answer the following specific questions on the process of acquisition of definite and indefinite articles based on naturalistic IL performance in the context of EFL:

- Do ILs acquired exclusively in the context of EFL involve systematic variability at all with respect to article usage?
- If so, how similar or dissimilar is it compared with the systematic

variability found in ILs acquired in the more naturalistic contexts of ESL?

- How does the system of articles in English ILs evolve over time? Do different ILs follow more or less uniform paths in the process of approximations to TL? Are there any significant differences in the paths of acquisition among EFL learners, who can be assumed to have quite heterogeneous backgrounds of learning?
- Are there any significant performance strategies EFL learners could exploit in order to make their IL system of rules constructed at a given stage of acquisition more efficient?

3.2. Longitudinal data and subjects

While a predominant majority of past studies (mainly those in the ESL context) which focus on naturalistic production of IL are concerned with spoken data for analysis, the present study analyzes written data. I have selected this particular mode of communication as analytical data for the following reasons. First, the written mode is the primary productive means of international/intercultural communication for Japanese learners of EFL, as compared with the ESL context where the spoken mode is the indispensable medium of everyday communication as well as that of classroom instruction (Lee, 1997; Noguchi, 1997). Exclusive focus on the spoken mode in past studies seems to be a bias stemming from the prevalent orientation to the ESL context in SLA research in general. Though the teaching and learning of the spoken mode of communication have increasingly been stressed in school English education in Japan these days, it is still the case that the written mode of TL production

is natural or unmarked for a great majority of Japanese college students. They are much more accustomed to expressing themselves in writing than in speaking after a minimum of six years of intensive exposure to the written code (i.e., reading and writing) in junior and senior high schools. Second, the misuse of the article system is more likely to cause misunderstandings in the written mode of communication than in the spoken (Noguchi, 1997), which suggests that more vigorous research on learners' written product should be vital for diagnostic and pedagogical purposes especially in EFL contexts such as in Japan.

To investigate each individual learner's process of article acquisition over time, EFL compositions written by two Japanese female college students have been analyzed. The subjects, Akiko and Natsuko, are both English majors who have participated in the identical EFL curricula at the same university. Prior to this study, both subjects had studied English as a school subject for 6 years of junior and senior high school without any extensive exposure to natural TL input and interaction in English-speaking countries. The compositions for the present analysis were written and turned in as the occasional homework of two semester-long English composition classes they were taking as part of degree requirements. When they became juniors, I asked them to contribute the compositions they had kept to this study as data. That is, neither was aware that their use of articles as well as their compositions per se would be analyzed when they were writing them.

Akiko and Natsuko can be considered to belong to a group of intermediate learners with roughly the same level of English proficiency, judging from the sequences of the TOEFL scores they

earned on the following three occasions (see Table 2): at the beginning of their freshman year (April, 2000), at the end of their freshman year (January, 2001), and at the end of their sophomore year (January, 2002).

TABLE 2
Subjects' TOEFL Scores

| <i>Subject ID</i> | April, 2000 | January, 2001 | January, 2002 |
|-------------------|-------------|---------------|---------------|
| Akiko | 423 | 447 | 513 |
| Natsuko | 463 | 447 | 493 |

Data was collected from four specific periods during two years of observation: 1) the spring semester of their freshman year (mid-April through mid-July, 2000); 2) the fall semester of their freshman year (mid-September through mid-December, 2000), with about a two-month summer break intervening; 3) the spring semester of their sophomore year (2001), with about a three-month spring break intervening; and 4) the fall semester of their sophomore year (2001), again with a two-month interval. The compositions collected were the first drafts of their writing, which had not received any correction of grammatical errors by native speakers of English, though the subjects more or less consulted dictionaries when necessary. All the compositions were proofread and corrected with respect to the uses of articles, other pre-nominal modifiers, and noun forms by a native speaker of English who holds a Master's degree in TESOL.

3.3. The variables examined and analytical procedures

While the primary target of analysis in this study concerns the learners' usage of articles (definite 'the,' indefinite 'a/n,' and zero

marking), the scope of analysis is extended to accommodate other variable manifestations of pre-nominal environments, based on the finding of prior studies that other pre-nominal modifiers are likely to perform similar functions to articles in internally consistent IL grammar (Parrish, 1987; Young, 1996). Specific pre-nominal modifiers to be analyzed include quantifiers (e.g., some, any, several, each, etc.), demonstratives (e.g., this, those, etc.), possessives, and numerals (e.g., one, two, etc.). All these features in pre-nominal environments are considered to be dependent variables.⁵ Uses of articles and other pre-nominal modifiers in prefabricated patterns (i.e., unanalyzed chunks) have been excluded from analysis.

As reviewed earlier, no systematic analysis of the relative effects of intersecting factors on variation in English IL has been conducted except for Young (1996). A predominant majority of past studies (both ESL-based and EFL-based) have dealt only with one-to-one relationships between article usage and its functions. But in fact, some of the past studies have clearly shown that there *is* some correlation between article usage and other types of grammatical features. The present analysis adopts a multi-dimensional approach, in that every occurrence of variable usage of articles is simultaneously affected by linguistic factors of various kinds, which are considered to be independent variables. The results to be obtained regarding each of the learners will provide a holistic picture of how systematically (or non-systematically) variations in EFL article usage are governed (i.e., variable IL grammar), and any diachronic change in IL grammar will reveal the developmental process of article acquisition by Japanese learners of EFL.

The following list represents an initial hypothesis I constructed

with respect to the variable IL grammar of article usage. It consists of potential independent variables that are assumed to have some systematic effects on the variable production of articles. In addition to the universalistic categories discussed in detail in the previous section, the attributes of the noun and several surface-level constraints are also included. Explanations of relevant literature that has not been reviewed in the preceding sections are also added.

Independent factor groups (FGs)

FG-1 *Referential status/hearer knowledge of the noun marked with articles and other pronominal modifiers* (Table 1) (Huebner, 1984; Tarone & Parrish, 1988):

- ① the [-SR, +HK] type — generic nouns;
- ② the [+SR, +HK] type — unique referents, referents previously mentioned in the discourse, and specific referents assumed known to the reader;
- ③ the [+SR, -HK] type — first-mentioned [+SR] nouns that are assumed not known to the reader, first-mentioned [+SR] nouns following the existential 'have' or 'there is/are' assumed not known to the reader;
- ④ the [-SR, -HK] type — equative nouns, nouns in the scope of negation, nouns in the scope of interrogative, and nouns in the irrealis scope.

Every occurrence of nouns in the learners' essays is classified into the 10 different types of nouns in the list. Nouns that seem to refer to physically present entities are excluded from analysis because of difficulties in coding such tokens reliably from written data.

FG-2 *Count/non-count distinction and number of the noun marked with*

articles and other prenominal modifiers (Kim Yoon, 1993; Young, 1996; Lee, 1997):

non-count nouns, singular nouns, plural nouns.

Countability of the noun marked and distinctions between singularity and plurality of the noun as co-occurring with the pre-nominal elements are analyzed. Lee's (1997) study of EFL compositions written by 49 freshmen at a South Korean university showed that their omissions of both DA and IA are sensitive to the types of nouns. When nouns following the articles are non-count nouns, the articles are more likely to be omitted. When they are count nouns, the articles are more likely to be used.

FG-3 *Syntactic position of the noun marked with articles and other pre-nominal modifiers* (Parrish, 1987; Yamada, 1996; Mizuno, 2000):

subject position, predicate position, and the object of the preposition.

FG-4 *Internal structure of the noun phrase involving post-modifiers of the noun marked* (Yamada, 1996; Young, 1996; Takahashi, 1997):

the noun in simple NP, the head noun of the post-modified prepositional phrase (e.g., rate of dollar), the post-modifier of the post-modified PP (e.g., rate of dollar), the head noun of the relative clause.

FG-5 *Internal structure of the noun phrase involving pre-modifiers of the noun marked* (Lee, 1997; Mizuno, 2000):

adjectives (e.g., a beautiful animal), numerals (e.g., the three dogs), compound nouns (e.g., starvation problem).

The following two factor groups (FG-6 and 7) are concerned with contextual cues to the marking of articles. Mizuno (2000) claims

that the use of articles is likely to be affected both positively and negatively by other linguistic elements of the sentence, which may either substitute for the functions of articles or help the learner choose appropriate articles.

FG-6 *Specific structures* (Thomas, 1989; Noguchi, 1997; Mizuno, 2000):

‘this is,’ ‘that is,’ ‘there is,’ ‘there are’ as preceding the noun marked with articles.

FG-7 *Number correspondence between the subject and the complement* (Mizuno, 2000):

correspondence (e.g., he is a student) or mismatch (e.g., the most impressive memory is my high school days) between the subject and its complement in number.

The present study conducts one type of multivariate analysis known as VARBRUL (Sankoff, 1988), which is particularly more suitable for handling the inevitable imbalance of factor distributions in natural linguistic data than other similar types of programs such as ANOVA (Young & Bayley, 1996). The greatest advantage of adopting VARBRUL for the present analysis lies in its capacity to figure out the relative significance among multiple intersecting factors in affecting the production of the dependent variable. That is, the learner’s use of articles (i.e., the dependent variable) is subject not to the influence of a single contextual factor (e.g., referential status) but to simultaneous effects of multiple contextual factors (i.e., FG-2, 3, etc. besides FG-1). To figure out the system of rules for article usage in IL, our task is to find out the relative significance of the factors that are hypothesized to affect variable usage of articles and to examine how it is different from that of native speakers of TL.

Because of unavoidable skewedness of natural linguistic performance and enormously complex intersecting relationships among potential constraints, the learner's variable grammar and its diachronic change will be described probabilistically (Rousseau & Sankoff, 1978).

The present analysis uses the GoldVarb program (Rand & Sankoff, 1990), the application of VARBRUL for the Macintosh computer. This version enables us to measure the relative effects of all the potential factors on the dependent variable in terms of the weight of each factor in relation to the other remaining factors. Stepwise regression analysis of the program is also capable of sorting out the groups of variables whose effects are statistically significant.

3.4. Results

As shown in Table 3, a total of 1551 occurrences of articles and pre-nominal modifiers have been analyzed. The overall accuracy ratio is 83%. A total of 1117 occurrences of DA, IA, and zero marking have also been analyzed separately, with an accuracy ratio of 79%. Table 3 also shows the total number of tokens analyzed for each of the subjects: 819 (DA[d] + IA[i] + zero marking[z] + other pre-nominal modifiers[o]) and 577 (d + i + z) for Akiko, and 780 and 580 for Natsuko, respectively. Each subject's accuracy ratios of the dependent variables over the four observation periods (Time 1 through 4) are also indicated.

TABLE 3

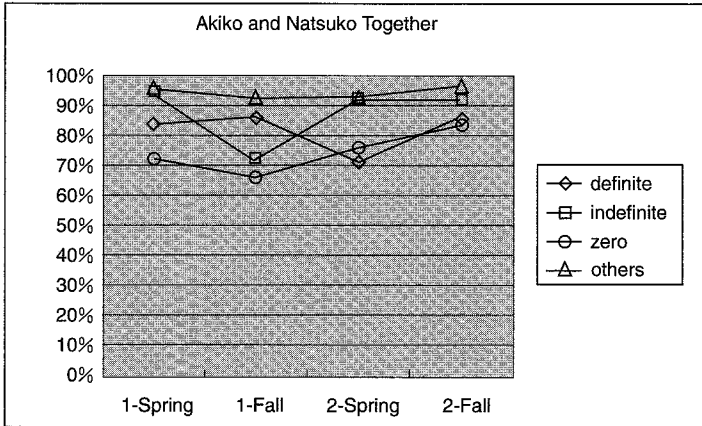
Number of Tokens Analyzed and Correct Use %: Subjects x 4 Periods

| | Time 1 | | Time 2 | | Time 3 | | Time 4 | | Total | |
|---------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|----------------|
| Akiko | definite | 78%(21/27) | definite | 88%(36/41) | definite | 60%(64/107) | definite | 94%(32/34) | definite | 73%(153/209) |
| | indefinite | 98%(39/40) | indefinite | 72%(18/25) | indefinite | 95%(19/20) | indefinite | 93%(14/15) | indefinite | 90%(90/100) |
| | zero marking | 61%(36/59) | zero marking | 72%(49/68) | zero marking | 89%(57/64) | zero marking | 82%(63/77) | zero marking | 76%(205/268) |
| | other modifiers | 96%(72/75) | other modifiers | 99%(59/62) | other modifiers | 94%(50/53) | other modifiers | 98%(51/52) | other modifiers | 96%(232/242) |
| | d + I + z + o | 84%(168/201) | d + I + z + o | 83%(162/196) | d + I + z + o | 78%(190/244) | d + I + z + o | 90%(160/178) | d + I + z + o | 83%(680/819) |
| | d + I + z | 76%(96/126) | d + I + z | 77%(103/134) | d + I + z | 73%(140/191) | d + I + z | 87%(109/126) | d + I + z | 78%(448/577) |
| Natsuko | definite | 89%(31/35) | definite | 83%(19/23) | definite | 99%(44/46) | definite | 81%(42/52) | definite | 87%(136/156) |
| | indefinite | 83%(10/12) | indefinite | 71%(25/35) | indefinite | 90%(28/31) | indefinite | 90%(19/21) | indefinite | 81%(82/99) |
| | zero marking | 83%(45/54) | zero marking | 56%(25/45) | zero marking | 66%(60/91) | zero marking | 86%(82/95) | zero marking | 74%(212/285) |
| | other modifiers | 95%(39/41) | other modifiers | 89%(32/36) | other modifiers | 92%(44/48) | other modifiers | 97%(65/67) | other modifiers | 94%(180/192) |
| | d + I + z + o | 88%(125/142) | d + I + z + o | 73%(101/139) | d + I + z + o | 81%(176/216) | d + I + z + o | 89%(208/235) | d + I + z + o | 83%(610/732) |
| | d + I + z | 85%(86/101) | d + I + z | 67%(69/103) | d + I + z | 79%(132/168) | d + I + z | 85%(143/168) | d + I + z | 80%(430/540) |
| Total | definite | 84%(52/62) | definite | 86%(55/64) | definite | 71%(108/153) | definite | 86%(74/86) | definite | 79%(289/365) |
| | indefinite | 94%(49/52) | indefinite | 72%(43/60) | indefinite | 92%(47/51) | indefinite | 92%(33/36) | indefinite | 86%(172/199) |
| | zero marking | 72%(81/113) | zero marking | 66%(74/113) | zero marking | 76%(117/155) | zero marking | 84%(145/172) | zero marking | 75%(417/553) |
| | other modifiers | 96%(111/116) | other modifiers | 93%(91/98) | other modifiers | 93%(94/101) | other modifiers | 97%(116/119) | other modifiers | 95%(412/434) |
| | d + I + z + o | 85%(293/343) | d + I + z + o | 79%(263/335) | d + I + z + o | 80%(366/460) | d + I + z + o | 89%(368/413) | d + I + z + o | 83%(1290/1551) |
| | d + I + z | 80%(182/227) | d + I + z | 73%(172/237) | d + I + z | 76%(272/359) | d + I + z | 86%(252/294) | d + I + z | 79%(878/1117) |

Among the overall average ratios of accuracy (see the Total columns), correct uses of DA and IA over time are contrastive to those of intermediate learners of EFL in Kubota (1994) and in Yamada (1996). In the former study, which analyzed EFL compositions written by 57 Japanese college students, the accuracy ratios of IA were 77.3% (out of 58 occurrences) in Time 1 and 83% (out of 83) in Time 2 (a year later). The accuracy ratios of DA were 95.5% (out of 85) in Time 1 and 91.5% (out of 75) in Time 2. Kubota concludes that the subjects' usage of the article system has not made any progress over a year. In the latter study, which investigated only the use of DA by 5 Japanese college students, the accuracy ratios were an average of 71% (out of 125) in Stage I, 77% (out of 110) in Stage II (5 months later), and 90% (out of 77) in Stage III (13 months later). Yamada concludes that the subjects have shown an improvement in their usage of DA.

FIGURE 1

The Subjects' Correct Use over 4 Periods



The present results (Table 3, Figure 1) show an average of 94% (49/52) accuracy in Time 1, 72% (43/60) in Time 2, 92% (47/51) in Time 3 (a year later), and 92% (33/36) in Time 4 for IA. As for DA, the results show an average of 84% (52/62) accuracy in Time 1, 86% (55/64) in Time 2, 71% (108/153) in Time 3, and 86% (74/86) in Time 4. Based on the 'group' results, it seems fair to assume that Akiko and Natsuko have shown quite a prolonged, gradual approximation to TL-like usage of the English article system over the 2 years of learning. The results, however, also seem to imply that one year of classroom learning of EFL may not be sufficient for Japanese learners to make a noteworthy progress in their acquisition of the article system, which coincides with Kubota (1994).

Rather our results indicate that the subjects' processes of acquisition do not necessarily consist of a straightforward, linear progression but has involved a great deal of "backsliding," which is

characteristic of relatively 'earlier' stages of acquisition process (Brown, 1994: 211). Moreover, a simple comparison of accuracy ratios alone must lead to the drastic claim that DA has not necessarily been acquired earlier and in a more stable manner than IA, contrary to the generalization put forth by a number of prior studies both in ESL and EFL contexts. The validity of this preliminary observation will be examined further in the following sections.

Figures 2 and 3 are the schematic representations of Akiko's and Natsuko's correct uses of the article system and other pre-nominal modifiers over time, respectively. A few observations are in order.

FIGURE 2

Akiko's Correct Use over 4 Periods

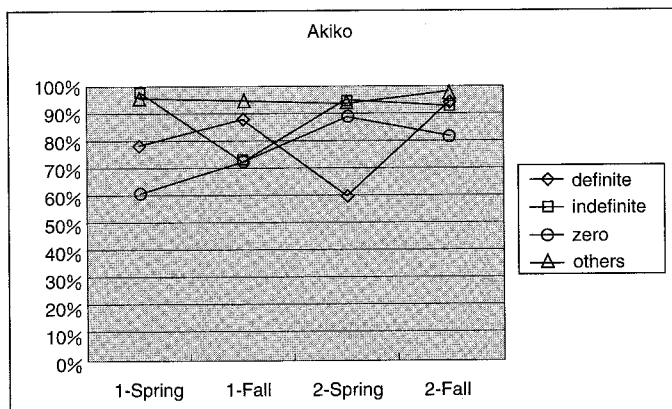
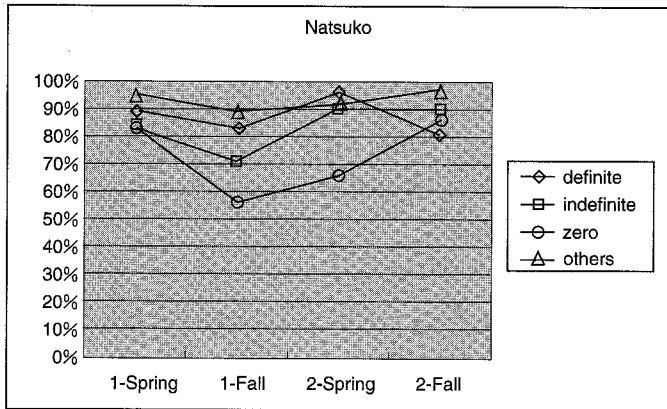


FIGURE 3

Natsuko's Correct Use over 4 Periods



As already pointed out, neither subject has shown a linear, steady progress in correct usage of the article system in general as learning proceeded. Moreover, the patterns of instability as well as the accuracy ratios vary significantly between the subjects, despite both subjects having learned EFL in the identical curricula and made a steady progress in overall English proficiency over the two years of observation (see the sequences of their TOEFL scores in Table 2). Akiko's patterns of progress appears to be more fluctuating especially in her uses of DA and IA, as compared with Natsuko's, which display a gradual upward curve as time passed.

Some aspects are shared by the subjects. Both figures show relatively lower accuracy ratios of zero marking than the remaining three variables over the periods (though there are a few exceptions). This result coincides with a number of prior studies of Japanese EFL learners such as Yamada & Matsuura (1982), Kubota (1994)

and Mizuno (2000). In addition, both figures consistently show high accuracy ratios of pre-nominal modifiers (see the [others] lines) over time. In order to determine any systematicity underlying this seemingly chaotic state of individual variations, let us now take a closer look at how the independent factors (discussed in Section 3.3) would constrain the subjects' article usage.

3.4.1. Diachronic variation in use of definite articles

To account for systematic variability in the subjects' uses of DA, VARBRUL analyses of the relative effectiveness of the crosscutting independent factors (see Section 3.3) have been conducted. VARBRUL weights in Table 4 describe the effects on accurate use in linkage to FG-1 (Status of Reference and Hearer Knowledge) as the independent variable. The closer a VARBRUL weight is to 1.00, the stronger effect the independent variable (FG-1) exerts in favor of accurate use of DA. The closer it is to 0.00, the stronger effect the independent variable exerts in disfavor of accuracy. A weight close to 0.50 indicates that the independent variable exerts neutral effects (neither positive nor negative).

TABLE 4

*VARBRUL Analysis of Accurate Uses of Definite Articles over 4 Periods:
Referential Status and Hearer Knowledge (FG-1)*

| Referential Types | Target Article | Subject ID | Time 1 | | Time 2 | | Time 3 | | Time 4 | |
|-------------------------|-----------------|------------|-------------------------------|-------------------|-------------------------------|-------------------|-------------------------------|-------------------|-------------------------------|-------------------|
| | | | % marked correctly with DA | VARBRUL weight | % marked correctly with DA | VARBRUL weight | % marked correctly with DA | VARBRUL weight | % marked correctly with DA | VARBRUL weight |
| [-SR, +HK] Generics | the, a(n), zero | Akiko | 3% (1/35) | 0.77 | 16% (7/38) | 0.41 | 15% (13/85) | 0.25 | 2% (1/45) | 0.07 |
| | | Natsuko | 4% (1/28) | 0.06 | 7% (1/15) | 0.01 | 19% (16/85) | 0.45 | 6% (4/64) | 0.19 |
| [+SR, +HK] Unique | the | Akiko | 100% (6/6) | *** | 33% (1/3) | 0.42 | 63% (5/8) | 0.73 | 0% (0/8) | *** |
| | | Natsuko | 100% (2/2) | *** | 0% (0/9) | *** | 33% (3/9) | 0.59 | 50% (1/2) | 0.76 |
| [+SR, +HK] Anaphoric | the | Akiko | 9% (1/11) | 0.48 | 25% (8/32) | 0.51 | 74% (14/19) | 0.83 | 33% (3/9) | 0.7 |
| | | Natsuko | 67% (10/15) | 0.97 | 70% (7/10) | 0.94 | 86% (6/7) | 0.98 | 58% (7/12) | 0.82 |
| [+SR, +HK] Specific | the | Akiko | 24% (13/55) | 0.75 | 38% (20/52) | 0.57 | 66% (31/47) | 0.77 | 55% (28/51) | 0.92 |
| | | Natsuko | 45% (18/40) | 0.69 | 38% (11/28) | 0.77 | 38% (19/50) | 0.44 | 49% (30/61) | 0.76 |

Note (1): the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

Note (2): categorical use (100%) or non-use (0%) cannot be included in VARBRUL analysis.

VARBRUL analyses have revealed that FG-1 consistently exerts robust effects on Natsuko's accuracy of DA in particular throughout the four periods of observation (see the statistically significant weights higher than 0.50 in boldface italics). That is, variability observed in Natsuko's DA production, which is not necessarily native-like, has been rule-governed (or differentiated) in close linkage to this factor group: when making her decisions on the use of DA, Natsuko has operated systematically on her IL grammar constructed at given stages, in which the types of semantic reference and hearer knowledge differentially contribute to accurate production as internalized rules. As for Akiko's uses of DA, on the other hand, the results indicate that some systematicity in linkage to FG-1 began to be formulated roughly after her freshman year was over. At the first two stages (Time 1, 2), Akiko's uses of DA appear to be immune to the factor group (except for 0.75 in Specific Referent), but her grammar emerged in Time 3 and has become influential in parallel ways to

Natsuko's thereafter.

The results also clearly suggest that the process of acquisition of DA should involve both shared and discrepant aspects of variability between individuals, depending on the referential types of DA. As shared aspects, it is highly unlikely that generic referents are accurately marked with DA in both subjects' ILs, as VARBRUL weights consistently indicate statistically significant disfavoring effects.⁶ While prior ESL studies of learners of various L1 backgrounds (including Japanese L1) have put forth a generalization that the [-SR, +HK] feature (i.e., generics) is over-specified with DA due to the learner's cognitive response to the [+HK] feature (Huebner, 1984; Master, 1987), our subjects have hardly marked generic reference with DA (and IA). Rather, in accord with prior EFL studies of Japanese learners, which find that zero-marking is predominant in both DA and IA context (Noguchi, 1997), our subjects have selected zero marking among three possibilities (i.e., DA, IA, zero) as a common alternative to mark generic reference (see Note 6 and the next section on IA). Young's (1996) study of ESL learners of Czech and Slovak L1s, both of which, like Japanese, have no articles, indicates a similar tendency in that the use of DA is disfavored for generic referents to a statistically significant extent (0.35). As a potential interpretation of our subjects' consistent disfavor for generic referents, all the observations lead to a possibility of first language transfer, which tends to become more persistent in EFL learning environments of restricted TL input and interaction than in naturalistic environments like ESL (Marton, 1981). It is also a noteworthy finding that the process of acquisition by our intermediate learners of EFL still involves first language transfer,

which is generally considered to characterize relatively earlier stages of SLA (Brown, 1994).

As for the aspects constructed uniquely by each individual, it seems that Natsuko has begun to formulate a rule for unique referents since Time 3 (0.59; 0.76 in Time 4), whereas Akiko, who lags behind in her acquisition of DA rules in general, has shown instability in her use of the same feature throughout all the periods. In addition, for Natsuko, anaphoric referents can be assumed to be the earliest (and most easily) acquired feature for DA marking, because of the stability of probability weights (Time 1: 0.97; 2: 0.94, 3: 0.98; 4: 0.82). This result accords with the finding of Kubota (1994). Specific referents may be considered to be the second rule she has acquired, based on the slightly lower probability weights for accuracy (Time 1: 0.69; 2: 0.77; 3: 0.44; 4: 0.76). For Akiko, it is not until Time 3 that she began to formulate her rule for anaphoric reference (0.83; 0.70 in Time 4), while her rule for specific reference may have emerged at earlier stages (Time 1: 0.75) and perhaps has become more stable from Time 3 on (0.77; 0.92 in Time 4).

Because her IL grammar is lacking in anaphoric differentiation at relatively earlier stages of acquisition, Akiko seems to avoid taking risks of producing article errors, which may have resulted in her relatively higher accuracy ratios of DA in the earlier stages of acquisition (78% in Time 1, 88% in Time 2; as compared with Natsuko's 89% and 83%, respectively) (see Table 3) (Schachter, 1974). Instead, she takes advantage of possessives as the pre-nominal marker of anaphoric referents as a compensatory strategy. Table 5 compares the probabilities of the subjects' using DA and possessives as the markers of anaphoric referents.

TABLE 5

The Subjects' Use of Possessives for Anaphoric Reference as a Compensatory Strategy

| Speaker ID | Prenominal Modifiers for Anaphoric | Time 1 | | Time 2 | | Time 3 | | Time 4 | |
|------------|--|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|
| | | % marked with DA and Possessives | VARBRUL weight | % marked with DA and Possessives | VARBRUL weight | % marked with DA and Possessives | VARBRUL weight | % marked with DA and Possessives | VARBRUL weight |
| Akiko | the | 9% (1/11) | 0.24 | 25% (8/32) | 0.6 | 79% (15/19) | 0.77 | 22% (2/9) | 0.65 |
| | Possessives | 82% (9/11) | 0.94 | 28% (9/32) | 0.58 | 16% (3/19) | 0.48 | 0% (0/9) | *** |
| Natsuko | the | 67% (10/14) | 0.98 | 70% (7/10) | 0.95 | 86% (6/7) | 0.99 | 58% (7/12) | 0.82 |
| | Possessives | 14% (2/14) | 0.4 | 10% (1/10) | 0.46 | 0% (0/7) | *** | 25% (3/12) | 0.54 |

Note: demonstratives (e.g., that, this, etc.) were also used for anaphoric referents by both subjects.

Natsuko, who had acquired the DA rule to specify anaphoric referents, did not resort to the use of possessives (DA vs. Possessives: Time 1 - 0.98 vs. 0.40; Time 2 - 0.95 vs. 0.46; Time 3 - 0.99 vs. 0%[0/7]; Time 4 - 0.82 vs. 0.54). In contrast, Akiko carried out the marking of anaphoric reference by exploiting possessives when she had not yet acquired the anaphoric function of DA in her IL grammar (DA vs. Possessives: Time 1 - 0.24 vs. 0.94; Time 2 - 0.60 vs. 0.58). Akiko's avoidance behaviors gradually disappeared as time passed. Correspondingly, the compensatory strategy has been replaced by DA as Akiko acquired its anaphoric function from Time 3 on (Time 3 - 0.77 vs. 0.48; Time 4 - 0.65 vs. 0% [0/8]).

Now, let us focus on incorrect uses of DA in detail. Tables 6 and 7 describe the referential types of DA errors made by Akiko and Natsuko across the periods, respectively. As far as the frequencies of incorrect forms are concerned, it is difficult to identify any noteworthy improvement in DA usage over 2 years (Akiko: 22%-12%-40%-6%; Natsuko: 11%-17%-4%-19%). As far as the accuracy ratios are concerned, the results may support Yamada & Matsuura's (1982) claim that DA errors made by Japanese EFL students are hardly amended even at relatively advanced stages.

TABLE 6
Akiko's DA Errors: Referential Types x 4 Periods

| | Time 1 | Time 2 | Time 3 | Time 4 |
|---|------------|------------|--------------|-----------|
| Generic [-SR, +HK] (Target: the, a[n], zero) | 11% (3/27) | 2% (1/41) | 24% (26/107) | 6% (2/34) |
| 1st Mentions [+SR, -HK] (Target: a[n], zero) | 11% (3/27) | 7% (3/41) | 15% (16/107) | --- |
| Others | --- | 2% (1/41) | 0.9% (1/107) | --- |
| Error TOTAL | 22% (6/27) | 12% (5/41) | 40% (43/107) | 6% (2/34) |

TABLE 7
Natsuko's DA Errors: Referential Types x 4 Periods

| | Time 1 | Time 2 | Time 3 | Time 4 |
|---|------------|------------|-----------|-------------|
| Generic [-SR, +HK] (Target: the, a[n], zero) | --- | 4% (1/23) | 2% (1/46) | 6% (3/52) |
| 1st Mentions [+SR, -HK] (Target: a[n], zero) | 9% (3/35) | 9% (2/23) | 2% (1/46) | 12% (6/52) |
| Others | 3% (1/35) | 4% (1/23) | --- | 2% (1/52) |
| Error TOTAL | 11% (4/35) | 17% (4/23) | 4% (2/46) | 19% (10/52) |

The tables show that most DA errors made by the subjects mark either generic or first-mentioned referents (Akiko: 96% [generic 57%, 1st mentions 39%]; Natsuko: 85% [generic 25%, 1st mentions 60%]). This observation is accordant with the findings of prior studies on overproduction (or overgeneralization), though unsystematic "flooding" may not be the proper term for characterizing the quantitative distributions in this study. Past studies find that either generic (Huebner, 1984; Master, 1987; Young, 1996) or 1st mentioned referents (Parrish, 1987; Thomas, 1989; Kubota, 1994) tend to be

erroneously marked with DA, but it is unsure unsolved which is primarily responsible for the phenomenon. Unfortunately, our results do not seem to provide any clear-cut answer for the problem based purely on the frequencies of the universal categories, in that any diachronic change cannot be identified in terms of either ratios of errors or the referential types in the real-time process of acquisition.

A more qualitative look at individual error tokens, on the other hand, may provide us with some alternative account of the phenomenon. Once we take into account the relative effectiveness of other intersecting factors besides referential types (cf., Young, 1996), we can observe some patterns in how the subjects made these errors. Because of the small number of error tokens, VARBRUL analysis was unable to fulfill a stepwise regression analysis for statistical significance among the factors, thus it is merely adopted to indicate a tendency of interfactorial effectiveness in the production of DA errors.

TABLE 8
A Tendency of Factor Contributions to Akiko's DA Errors

| | Time 1 | Time 2 | Time 3 | Time 4 |
|----------------------------------|---------------------------|--------------------------------|-----------------------------|--------------------------------|
| <u>Internal Structure</u> | Simple: 0.47 (7% [5/67]) | Simple: 7% (4/59) ⁷ | Simple: 0.47 (27% [36/132]) | Simple: 1% (1/77) ⁸ |
| <u>of Noun Phrase:</u> | Head: 0.85 (25% [1/4]) | Head: 0% (0/5) | Head: 0.73 (50% [4/8]) | Head: 33% (1/3) |
| <u>Post-modifiers</u> | R.C.: 0% (0/7) | R.C.: NO TOKEN | R.C.: NO TOKEN | R.C.: 0% (0/1) |
| <u>Internal Structure</u> | Simple: 0.48 (7% [5/67]) | Simple: 0.44 (4% [2/52]) | Simple: 0.50 (28% [27/96]) | Simple: 5% (2/44) |
| <u>of Noun Phrase:</u> | Comp: 0.83 (25% [1/4]) | Comp: 0.69 (9% [1/11]) | Comp: 0.60 (31% [4/13]) | Comp: 0% (0/25) |
| <u>Pre-modifiers</u> | Adj.: NO TOKEN | Adj.: 0.60 (9% [1/11]) | Adj.: 0.49 (29% [9/31]) | Adj.: 0% (0/21) |
| As compared with: | | | | |
| <u>Referential Status</u> | Generic: 0.56 (8% [3/36]) | Generic: 0.36 (3% [1/38]) | Generic: 0.50 (29% [24/83]) | Generic: 4% (2/46) |
| | 1*Ments: 0.44 (9% [3/35]) | 1*Ments: 0.59 (9% [3/36]) | 1*Ments: 0.50 (28% [16/57]) | 1*Ments: No tokens |

Table 8 shows that referential status (generic and 1st mentioned reference) does not seem to induce Akiko's errors so strongly as FG-4 (Internal structure of the noun phrase marked: post-modifiers) and FG-5 (Internal structure of the noun phrase marked: pre-modifiers). Akiko is likely to mark the head noun that is post-modified by the prepositional phrase (e.g., ... because of the violence scenes of the television), which resulted in non-TL usage of DA (Head: 0.85 in Time 1, 0.73 in Time 3, 33% in Time 4). Akiko is also likely to mark compound nouns (e.g., ... take the ballet lesson, ... face the starvation problem, etc.) as well as nouns modified by adjectives (e.g., the serious problems) erroneously (Comp: 0.83 in Time 1, 0.69 in Time 2, 0.60 in Time 3; Adj: 0.60 in Time 2), but this rule operation seems to have been abandoned in Time 4.

TABLE 9
A Tendency of Factor Contributions to Natsuko's DA Errors

| | Time 1 | Time 2 | Time 3 | Time 4 |
|---------------------------|----------------------------------|---|---|--|
| Internal Structure | Simple: 0.42 (2% [1/63]) | Simple: 0.40 (2% [1/15]) | Simple: 2% (2/110) | Simple: 0.53 (5% [1/77]) |
| of Noun Phrase: | Head: 0.94 (25% [1/4]) | Head: 0.87 (13% [1/8]) | Head: 0% (0/17) | Head: 0.37 (7% [1/15]) |
| Post-modifiers | R.C.: 0.94 (25% [1/4]) | R.C.: 0.97 (20% [1/5]) | R.C.: 0% (0/4) | R.C.: NO TOKEN |
| Internal Structure | Simple: 6% (3/53) | Simple: 6% (3/51) | Simple: 0.43 (1% [1/102]) | Simple: 0.42 (5% [4/74]) |
| of Noun Phrase: | Comp: 0% (0/7) | Comp: 0% (0/10) | Comp: 0% (0/7) | Comp: No Tokens |
| Pre-modifiers | Adj.: 0% (0/11) | Adj.: 0% (0/15) | Adj.: 0.72 (3% [1/29]) | Adj.: 0.64 (12% [5/42]) |
| As compared with: | | | | |
| Referential Status | Generic: 0% (0/28) | Generic: 0.67 (7% [1/15]) | Generic: 0.49 (1% [1/85]) | Generic: 0.38 (5% [3/60]) |
| | 1 st Ments: 7% (3/43) | 1 st Ments: 0.45 (3% [2/61]) | 1 st Ments: 0.57 (2% [1/46]) | 1 st Ments: 0.63 (11% [6/56]) |

Table 9 shows that Natsuko's patterns of DA errors are similar to Akiko's, though her overall rates of occurrence are even lower. Here

again, referential status does not seem to be as responsible for Natsuko's errors as the other two factor groups in terms of VARBRUL weights.⁹ Clearly the major cause of Natsuko's errors is overgeneralization of marking the head noun that is post-modified either by the prepositional phrase or the relative clause (e.g., the children who do well in the test and ...) (Time 1: Head-0.94, R.C.-0.94; Time 2: Head-0.87, R.C.-0.91). The latter type of overgeneralization errors have also been found repeatedly in prior studies such as Yamada (1996) and Takahashi (1997) which dealt with Japanese EFL learners. Natsuko's overgeneralization, however, has begun to disappear since Time 3 as acquisition progressed.¹⁰

All the types of errors described thus far can be considered to stem from overgeneralization of 'specifying' the noun in question, which is the primary function of DA. Relative effectiveness among intersecting factors other than referential status seems to suggest that both subjects should be attentive to the [+SR] feature rather than [+HK] in making those typical errors of DA. In addition, diachronic analyses of rule-governedness of errors, rather than simple comparisons of bare percentages of errors, also indicate that the subjects' acquisition of DA has certainly made progress towards eliminating the factors that are the potential causes of errors (cf., Yamada & Matsuura, 1982).

The patterns of errors evoke a possibility that a variety of intersecting factors other than FG-1 (Section 3.3) would have some systematic effects on the learners' accurate usage of DA as constraints. Because the number of occurrences of the target structures is too small and unbalanced in each single period to conduct statistical analysis, the current analysis has dealt with Time 1 and 2 as

combined for the first observation period, and Time 3 and 4 for the second in order to account for any change over time. VARBRUL analyses of relative effectiveness among the factors have found that FG-2, 3, and 4 exert statistically significant effects on DA accuracy. Table 10 and 11 describe the effects of those factor groups on Akiko's and Natsuko's DA uses respectively and diachronic changes in effectiveness as acquisition progressed.¹¹

TABLE 10
The Effect of Diachronic Change on Akiko's Accurate Use of DA

| Factor Groups Selected | Factors | Time 1 and 2 | | Time 3 and 4 | |
|--|-------------------|----------------------------|--------------------|----------------------------|--------------------|
| | | % marked correctly with DA | VR weights | % marked correctly with DA | VR weights |
| Noun Countability and Number | Non-count Nouns | 0% (0/8) | *** | 31% (4/13) | 0.27 |
| | Singular Nouns | 29% (54/185) | <i>0.56</i> | 34% (49/145) | 0.54 |
| | Plural Nouns | 7% (3/41) | <i>0.26</i> | 30% (32/105) | 0.48 |
| Clause Position | Subject | 25% (14/56) | <i>0.47</i> | 34% (25/74) | 0.58 |
| | Predicate | 15% (11/71) | <i>0.37</i> | 34% (32/95) | 0.41 |
| | After preposition | 26% (24/94) | <i>0.66</i> | 33% (31/93) | 0.53 |
| Internal Structure of NP: Post-modifiers | Simple | 20% (20/183) | <i>0.44</i> | 27% (54/199) | <i>0.44</i> |
| | Head of PP | 42% (8/19) | <i>0.77</i> | 71% (20/28) | <i>0.87</i> |
| | Head of RC | 90% (9/10) | <i>0.99</i> | 100% (10/10) | *** |
| | Post-modifier | 14% (3/21) | <i>0.26</i> | 31% (11/36) | <i>0.53</i> |

Note (1): the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

Note (2): categorical use (100%) or non-use (0%) cannot be included in VARBRUL analysis.

TABLE 11
The Effect of Diachronic Change on Natsuko's Accurate Use of DA

| Factor Groups Selected | Factors | Time 1 and 2 | | Time 3 and 4 | |
|------------------------------|-----------------|----------------------------|--------------------|----------------------------|--------------------|
| | | % marked correctly with DA | VR weights | % marked correctly with DA | VR weights |
| Noun Countability and Number | Non-count Nouns | 0% (0/3) | *** | 13% (1/8) | <i>0.45</i> |
| | Singular Nouns | 39% (47/122) | <i>0.59</i> | 36% (75/205) | <i>0.56</i> |
| | Plural Nouns | 14% (3/21) | <i>0.11</i> | 15% (11/73) | <i>0.34</i> |

Note: the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

We first notice that the factor groups that are found to be statistically significant greatly vary between Akiko and Natsuko.

The only factor group that is shared is systematic effects of noun countability and number (FG-2). At earlier stages (Time 1+2), singular nouns weakly promoted accurate usage of DA (Akiko: 0.56; Natsuko: 0.59) and plural nouns strongly inhibited it (0.26, 0.11, respectively) in both learners' ILs. Akiko's statistically insignificant weights at later stages (Time 3+4) indicate that she has succeeded in amending this non-TL-like differentiation as acquisition progressed, though the effect of non-count nouns still appears to be quite strong (0.27). Natsuko's uses, on the other hand, have been affected throughout the process of acquisition by the restricted operation, while a certain degree of improvement could be identified in terms of the weaker inhibiting weight of plural nouns (0.34) and the weights of non-count (0.45) and singular (0.56) nouns that are close to the neutral value (0.50).

Conducting VARBRUL analyses of ESL speech of Czech and Slovak learners, whose native languages make distinctions in nominal countability and number, Young (1996) did not find any notable effects of this factor group on the use of DA (though their uses of indefinite articles and zero marking were positively affected [i.e., positive L1 transfer]). Because of this empirical evidence and the fact that our learners, who also share L1, possess very similar patterns of variability with the constraints, it seems fair to assume that the current results represent negative L1 transfer. The lack of the nominal distinctions in Japanese contributes negatively to the learners' choice of articles. It is 'unmarked' for singular nouns to be marked with articles, thus the learners are more likely to be correct with DA marking. On the other hand, it is unmarked for plural and non-count nouns to stand alone with zero marking, thus 'marked' uses of DA with those types of nouns require of the learners advanced

operational knowledge. The present results suggest that the learning problems Japanese EFL/ESL learners would generally face with the article system should be intertwined with their mastery of nominal distinctions of countability and number, in addition to the difficulties in acquiring referential functions of articles per se.

Akiko's accurate usage of DA has also been systematically affected by the internal structure of the noun phrase (FG-4) throughout the process of acquisition (Table 10). The use of DA in the post-modifying phrase inhibits accuracy at earlier stages (0.26), but has become almost neutral at later stages (0.53). The head noun of the relative clause has the strongest promoting effects on her accuracy of DA marking at both periods (0.99; 100%). The head noun of the prepositional phrase also has strong promoting effects (1+2: 0.77; 3+4: 0.81). Both of these findings are accordant with the findings of prior studies of Japanese EFL learners (Yamada, 1996; Takahashi, 1997). Note that Akiko's DA errors were primarily due to her overgeneralization of specifying the head noun of the prepositional phrase (Table 8). Specification of the head noun of the relative clause, whose acquisition is found to be near completion in the current result, did not produce any related errors in Akiko's uses of DA.¹²

There is another factor group that is found to be statistically significant at Akiko's earlier stages of acquisition but has lost its impact as constraints at later stages. Clause position of the noun marked with DA (FG-3) has both positive and negative effects on accuracy. The noun in the predicate is less likely to be marked accurately with DA (0.31) only at earlier stages of acquisition, which exactly coincides with the finding of Parrish (1987), who longitudinally studied a Japanese ESL learner. The noun following

the preposition, on the other hand, is more likely to be marked with DA correctly (0.66) (e.g., one of the problems...). These effects have been leveled as her acquisition progressed.

It is an intriguing observation that each of the subjects constructs her own unique set of IL constraints on DA marking as time passes. It may be fair to assume that Akiko, who had not yet acquired a solid system of rules based on referential status of DA at relatively earlier stages, has been more inclined to receive effects from other types of constraints. Those constraints are mainly derived from characteristics of surface structure rather than cognitive analysis of referential/discoursal requirements of article usage. As her acquisition progressed, Akiko has constructed her grammar of DA based on the universal categories. Accordingly, those influential factors that were active at initial stages have lost their momentum as constraints. In contrast, Natsuko, who was already advanced in acquiring DA rules at earlier stages, has primarily been affected by the universal categories of DA as are native speakers of TL.

3.4.2. Diachronic variability in use of indefinite articles

Parallel to the analysis of DA presented in the last section, Table 12 describes the results of VARBRUL analysis of effects on accurate use of IA in linkage to FG1 (Status of Reference and Hearer Knowledge) as the independent variable.

TABLE 12

*VARBRUL Analysis of Accurate Uses of Indefinite Articles over 4 Periods:
Referential Status and Hearer Knowledge (FG-1)*

| Referential Types | Target Article | Subject ID | Time 1 | | Time 2 | | Time 3 | | Time 4 | |
|----------------------------|-----------------|------------|-------------------------------|-------------------|-------------------------------|-------------------|-------------------------------|-------------------|-------------------------------|-------------------|
| | | | % marked correctly with DA | VARBRUL weight | % marked correctly with DA | VARBRUL weight | % marked correctly with DA | VARBRUL weight | % marked correctly with DA | VARBRUL weight |
| [-SR, +HK] Generics | the, a(n), zero | Akiko | 0% (0/36) | *** | 3% (1/38) | 0.31 | 9% (8/85) | 0.49 | 0% (0/46) | *** |
| | | Natsuko | 0% (0/28) | *** | 0% (0/15) | *** | 6% (5/85) | 0.26 | 2% (1/64) | 0.76 |
| [+SR, -HK] 1st Mentions | a(n), zero | Akiko | 31% (11/35) | 0.4 | 22% (8/36) | 0.62 | 14% (8/57) | 0.58 | 22% (10/45) | 0.5 |
| | | Natsuko | 12% (5/43) | 0.42 | 28% (17/61) | 0.4 | 28% (13/46) | 0.79 | 14% (8/59) | 0.67 |
| [+SR, -HK] Existentials | a(n), zero | Akiko | 33% (7/21) | 0.52 | 0% (0/7) | *** | 10% (2/21) | 0.35 | 0% (0/9) | *** |
| | | Natsuko | 0% (0/5) | *** | 50% (1/2) | 0.63 | 50% (7/14) | 0.9 | 13% (2/16) | 0.79 |
| [-SR, -HK] Equatives | a(n), zero | Akiko | 70% (16/23) | 0.67 | 50% (9/18) | 0.93 | 33% (1/3) | 0.41 | 100% (1/1) | *** |
| | | Natsuko | 80% (4/5) | 0.94 | 50% (4/8) | 0.95 | 50% (2/4) | 0.53 | 40% (6/9) | 0.87 |
| [-SR, -HK] Negatives | a(n), zero | Akiko | 25% (2/8) | 0.39 | 0% (0/1) | *** | NO TOKEN | *** | 38% (3/8) | 0.51 |
| | | Natsuko | 33% (1/3) | 0.49 | 50% (1/2) | 0.52 | NO TOKEN | *** | 33% (2/6) | 0.86 |

Note (1): the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

Note (2): categorical use (100%) or non-use (0%) cannot be included in VARBRUL analysis.

Note (3): nouns in the scope of interrogative and irrealis [-SR, -HK] are not included in the analysis, due to the smallness of the sample.

In striking contrast to the results of DA (Table 4), statistically significant effects are not found on both Akiko's and Natsuko's accuracy of many of the functions in the majority of observation periods. This means that both subjects have had more difficulties in figuring out the system of rules for IA than for DA, and that the process of constructing IL grammar for IA requires a prolonged period of acquisition of the subjects as compared with DA. This observation seems to accord with a generalization mentioned earlier: DA is acquired earlier and more easily than IA (and zero articles). A tendency shared by both subjects is that IA is scarcely used for generic reference (as was the case in DA), which is thus very unlikely to contribute to accuracy, as indicated by the lack of tokens in a number of periods and significantly lower VARBRUL

weights.¹³

The current longitudinal investigation has revealed that the process of acquisition of IA also involves a great deal of individual variations. It seems that Akiko has not formulated the approximating system of rules for IA throughout the entire observation, in that no period indicates statistically significant effects on her accuracy. Natsuko, on the other hand, has begun to formulate IA rules since Time 3, as indicated by the statistically significant effects on her accuracy. Among the variety of referential functions of IA, the [+SR, -HK] feature (i.e., 1st mentioned nouns, nouns in the existential structure) seems to contribute steadily to Natsuko's accurate usage of IA (Time 3: 0.79, 0.90; Time 4: 0.67, 0.79, respectively). It is rather difficult, however, to judge whether such positive effects of the [-SR, -HK] also emerged at Time 3 because the number of tokens analyzed is too small.

A closer examination of error tokens, on the other hand, has revealed that IA errors are derived from a relatively restricted set of sources shared by the subjects. The sources are not necessarily related to overgeneralization or misinterpretation of referential functions of IA (FG-1) but are derived from some of the intersecting factors, as observed in the patterns of DA errors as well.¹⁴ The sources of errors made by Akiko and Natsuko can be categorized into three types: 1) misperception of noun countability and number, 2) underspecification of definiteness, and 3) misuse of 'a' for 'an' or vice versa. Akiko's IA errors (10% [10/100]) involve Type 1 40% of the time (4/10), in which non-count nouns such as 'food' and 'garbage' are marked with IA as a singular count noun. All of Akiko's Type 2 errors are due to underspecification of the head noun of the

prepositional phrase (e.g., He was a leader of that club.) (40% [4/10]), and the remaining errors are Type 3 (e.g., an yellow house) (20% [2/10]). Natsuko's IA errors (19% [17/99]), which are more frequent than Akiko's, consist mainly of Type 1 errors 65% of the time (11/17), which involve wrong choices of singular nouns for the context of plural nouns, as well as misperception of non-count nouns as singular count nouns. Twenty-four percent (4/17) of her errors are Type 2, with the same source as Akiko's, and the remaining 11% (2/17) is Type 3. Any diachronic change in these patterns of IA errors has not been identified in IL of either subject as time passed.

Stepwise regression analyses have been conducted to find out any statistically significant effects of the intersecting constraints on the subjects' accurate uses of IA. Just like in the analysis of DA, the current analysis has combined Time 1 and 2 for the first observation period, and Time 3 and 4 for the second in order to account for any change over time. Tables 13 and 14 describe the factor groups that have been found to exert statistically significant effects on Akiko's and Natsuko's accuracy of IA respectively, and show diachronic changes in their effectiveness as acquisition progressed.

TABLE 13
Diachronic Change in the Effect on Akiko's Accurate Use of IA

| | | Time 1 and 2 | | Time 3 and 4 | |
|------------------------|-------------------|----------------------------|--------------------|----------------------------|--------------------|
| Factor Groups Selected | Factors | % marked correctly with IA | VR weights | % marked correctly with IA | VR weights |
| Clause Position | Subject | 0% (0/65) | *** | 3% (2/60) | <i>0.26</i> |
| | Predicate | 39% (50/129) | <i>0.64</i> | 16% (16/99) | <i>0.58</i> |
| | After preposition | 7% (4/55) | <i>0.32</i> | 16% (14/85) | <i>0.67</i> |
| Specific Structure | There is | 12% (2/17) | 0.54 | 9% (2/22) | <i>0.84</i> |
| | Elsewhere | 28% (55/197) | 0.45 | 12% (31/250) | <i>0.46</i> |
| Number Correspondence | Yes | 55% (29/53) | <i>0.65</i> | 38% (5/13) | <i>0.89</i> |
| Subject and Predicate | Elsewhere | 17% (28/161) | <i>0.45</i> | 11% (28/259) | <i>0.47</i> |

Note (1): the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

Note (2): categorical use (100%) or non-use (0%) cannot be included in VARBRUL analysis.

TABLE 14

Diachronic Change in the Effect on Natsuko's Accurate Use of IA

| Factor Groups Selected | Factors | Time 1 and 2 | | Time 3 and 4 | |
|------------------------|-----------|----------------------------|--------------------|----------------------------|--------------------|
| | | % marked correctly with IA | VR weights | % marked correctly with IA | VR weights |
| Number correspondence | Yes | 47% (9/19) | <i>0.89</i> | 50% (10/20) | <i>0.94</i> |
| Subject and Predicate | Elsewhere | 23% (26/113) | <i>0.39</i> | 12% (35/281) | <i>0.45</i> |

Note: the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

The factor group shared by the subjects is FG-7, number correspondence between the subject and the complement in the SVC structure. Number correspondence is found to exert very strong positive effects on both Akiko's (Time 1+2: 0.65; Time 3+4: 0.89) and Natsuko's (0.89, 0.94) uses of IA. In fact, this structure is accommodated in the category of equatives (FG-1: [-SR, -HK]), which has been found not to be statistically significant except for Natsuko's later stages of acquisition (see Table 12). Namely, it is evident that identification of countability of the noun (i.e., singular count nouns in both subject and complement position) is crucial over referential considerations ([-SR, -HK]) for the subjects who have not acquired the TL system of rules to use IA accurately.

Akiko's accurate uses of IA in particular are also affected differentially by clause position of the noun to be marked (FG-3). In dramatic contrast to the result of DA (Table 10) in which the noun in predicate position (i.e., the complement or the object) is unlikely to be marked accurately, the noun in predicate position is likely to be marked with IA accurately (Time 1+2: 0.64; Time 3+4: 0.58), whereas the noun as the subject of the sentence is highly unlikely to be marked accurately (Time 1+2: 0%; Time 3+4: 0.26). IA marking of the noun after the preposition shows a great deal of improvement as time passed (Time 1+2: 0.32; Time 3+4: 0.67). In addition,

Akiko's uses of IA are also under the positive influence of commonly occurring structures such as 'there is' only at later stages (0.84).

Earlier, we were informed from overall accuracy ratios (Table 3) that Akiko uses IA more accurately than Natsuko (90%, 81%, respectively). In the present VARBRUL analysis of the universal categories, however, we have obtained the seemingly contradictory result that it is Akiko who has not constructed the TL-like system of rules throughout the entire periods of acquisition (Table 12). There are several reasons for this contradiction. First, given that her IL system of rules is not based on the universal categories of IA (FG-1), Akiko seems to have been more dynamic than Natsuko in testing hypotheses and constructing systematicity of her own. As shown in the results thus far, Akiko's IL is governed by multiple factors, which should provide her with numerous clues to proper usage of IA. Second, Akiko seems to be more advanced than Natsuko in identification of noun countability and number, which has found to be crucial for using IA accurately. While Akiko erroneously marked non-count nouns 17% of the time (4/24), Natsuko did so 33% (8/24). Natsuko also used IA with plural count nouns three times (2% [3/202]), whereas Akiko never did (0/186).¹⁵

Finally, it seems that Akiko has also been more progressive than Natsuko in adopting avoidance strategies, as also observed in the case of DA (Table 5). In striking contrast to Natsuko, Akiko quite extensively takes advantage of pronominal elements such as 'some' or 'any' as the [+SR, -HK] markers of first-mentioned nouns following existential 'have' or 'there is.' Table 15 compares the probabilities of occurrence of IA and pronominal elements as the marker of such nouns between Akiko and Natsuko.

TABLE 15

The Subjects' Use of Pronominals for Existential Structure as Compensatory Strategy

| Speaker ID | Target Article | Time 1 | | Time 2 | | Time 3 | | Time 4 | |
|------------|----------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|
| | | % marked with IA and Pronominals | VARBRUL weight | % marked with IA and Pronominals | VARBRUL weight | % marked with IA and Pronominals | VARBRUL weight | % marked with IA and Pronominals | VARBRUL weight |
| Akiko | a(n) | 33% (7/21) | 0.45 | 0% (0/7) | *** | 10% (2/21) | 0.42 | 0% (0/9) | *** |
| | Pronominals | 48% (10/21) | 0.95 | 71% (5/7) | 0.99 | 38% (8/21) | 0.87 | 56% (5/9) | 0.85 |
| Natsuko | a(n) | 0% (0/5) | *** | 50% (1/2) | 0.47 | 54% (7/13) | 0.95 | 19% (3/16) | 0.89 |
| | Pronominals | 0% (0/5) | *** | 0% (0/2) | *** | 46% (6/13) | 0.94 | 44% (7/16) | 0.61 |

Note (1): the numbers in boldface italics indicate statistical significance at $p < .05$ or less.

Note (2): categorical use (100%) or non-use (0%) cannot be included in VARBRUL analysis.

The results show that this particular factor (Existential Structure) exerts either zero or almost neutral effects on Akiko's use of IA throughout the four periods, whereas the same factor has begun to favor Natsuko's use of IA since Time 3 (0.95; 0.89 in Time 4). As a compensatory strategy, Akiko has adopted pronominals for the identical environment consistently over the entire period (Time 1-0.95; 2-0.99; 3-0.87; 4-0.85). Natsuko, on the other hand, does not seem to resort to the same strategy except for during Time 3 (0.94). Akiko's extensive use of pronominals in IA context can be interpreted as avoidance, which can be assumed to have resulted in her relatively higher ratio of accuracy of IA.

4. Discussion

We have investigated variable usage of definite and indefinite articles in ILs of Akiko and Natsuko, who had studied English as a school subject only in Japan (EFL) without any extensive exposure to natural input and interactions in TL countries. Although the EFL context is generally assumed to be impoverished in TL input

and interactions, our results still show that their variable usage of the articles involves a great deal of underlying systematicity. Our EFL learners' ILs are sensitive to robust effects of referential functions of the articles (especially so in the case of definite articles), as also demonstrated in a number of prior studies of ESL. Though the time of initiation and the rate of progress both vary, Akiko and Natsuko are learning how to differentiate the functions in making their choice of articles (Young, 1996). Their abilities in making right decisions appear to develop gradually as they approximate to TL norms over time.

Our EFL learners' processes of acquisition also involve the aspects that may potentially differ from general aspects of SLA in more natural learning environments (e.g., ESL) where extensive TL input and interactions are generally guaranteed. In the present study, the subjects' approximations to TL went through quite a prolonged process, which will perhaps require an extensive amount of time and duration for its completion. One year of observation identified hardly any noteworthy progress in usage of articles by either subject.

Our EFL subjects' processes of acquisition are also heavily characterized by first language transfer, which is reflected in typical patterns of both DA and IA errors as well as factorial contributions to accuracy. Almost categorical choice of zero articles for generic reference in the context of both DA and IA can be assumed to be due to negative transfer from Japanese L1 which has no article system (Noguchi, 1997). Correct identification of noun countability and number has also been found to be a crucial determinant that consistently affects the subjects' usage of DA and IA both positively

and negatively. First language transfer tends to be more persistent in EFL learning environments where TL input and interactions are generally restricted as compared with more natural environments like ESL (Marton, 1981). Of further significance is that the effect of L1 transfer, which is characteristic of earlier stages of SLA, remains relatively intact over time even at later stages of acquisition by our EFL subjects (i.e., Time 3 to 4: their late-intermediate to early-advanced stages with approximately 450 to 500 TOEFL scores) (cf., Brown, 1994).

Closely examining the actual growth of two individual learners over time, the design of the present study has also revealed 'creative' aspects of their constructions of IL grammars, which vary considerably even between the learners who have participated in the identical EFL curricula and achieved the same levels of TL proficiency. The individual variations observed involve both quantitative and qualitative aspects. Overall ratios of accuracy differ between the subjects, and diachronic patterns of improvement (or fluctuations) in accuracy ratios over time are also found to be quite individualistic. The subjects have had different points of departure for formulating the system of rules for article usage during the process of acquisition. Each has formed a certain hierarchical preference for referential functions of the articles to acquire (i.e., which function is to be acquired first) as well as established a unique set of multiple constraints on the marking of articles independently. For example, it seems that Akiko, who lagged behind Natsuko in her formulation of TL rules (i.e., FG-1) as first-order constraints, has actively tested various hypotheses of her own for internal consistency, involving a number of second-order constraints derived primarily from surface structure.

This individualistic formation of IL rules has gradually disappeared, however, as acquisition progressed (Ellis, 1985; Parrish, 1987).

Creative constructions extend to a learner strategy of avoidance for compensating deficiency of IL grammar at given stages of acquisition. Akiko, who had not acquired the solid system of rules for article usage, characteristically resorted to the use of other pronominal modifiers that can alternatively perform functions equivalent to articles in question (e.g., possessives for anaphoric DA; pronominals for existential IA). Receptive types of tasks for eliciting analytical data (e.g., cloze tests) would not be able to reach this type of outcome. Focusing on IL production data in naturalistic context, the present study has succeeded in shedding fair light on dynamic aspects of IL, which enable the learner with limited competence to make her performance more efficient.

Going back to Figures 2 and 3, it is quite enlightening to recognize that the gradual processes of the learners' constructing IL grammars over time are not necessarily reflected in overall accuracy ratios in each corresponding period of acquisition. The results discussed so far seem to imply that overall accuracy is heavily subject to what types of referential status a given article happens to carry in a given discourse (Tarone & Parrish, 1988). Since learners do not instantaneously acquire all the functions of a given article but gradually construct a hierarchical order of functions in their own unique ways, diachronic changes in overall accuracy ratios alone may be too unsophisticated to provide us with useful information for understanding real-time processes of acquisition. Moreover, in situations like the present study, where uncontrolled data from natural IL performance are likely to be skewed in terms of the

distribution of various functions, this problem is particularly crucial to resolve. The present analysis has demonstrated that probabilistic accounts are more heuristic than bare percentages in accounting for developmental processes of acquisition based on potentially skewed natural linguistic performance (Sankoff, 1988; Young & Bayley, 1996).

This insight has led to productive results. While overall accuracy ratios are not highly suggestive, our analysis of rule-governedness in constructing IL grammars has provided supportive evidence for a generalization put forth by a number of prior studies of articles in English IL: the learners initiate the system of rules for definite articles first, and the formulation of rules for indefinite articles (and zero articles) then follows. The present longitudinal investigation has shown that the diachronic state of acquisition by a single learner over time apparently involves a great deal of fluctuations or apparent 'backsliding' in terms of overall accuracy ratios, but the learner's construction of the underlying system is under way behind that chaos. Systematic accounts of relative effectiveness among intersecting factors, which few prior studies have attempted, are also found to be very useful for understanding real-time processes of acquisition. This study has demonstrated that focusing exclusively on the universal functions of articles (FG-1) is not fully conducive to diagnosing incorrect patterns of usage. Close examination of interfactor relationships has revealed the multi-dimensional nature of article acquisition, which consists not only of universal categories but also a unique set of other types of constraints hypothesized and tested by individual learners at given stages of acquisition.

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Notes

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2. The present study will discuss only the analysis of definite ('the') and indefinite ('a [n]') articles, due to limitations of space. Though my preliminary analyses have found a number of intriguing aspects of variability in zero marking (or the use of zero articles), those findings will be discussed in an independent paper in the near future.
3. Noguchi calls the subjects *shokyyu eigo gakushuu-sha* ('beginning level learners of English').
4. Yamada (1996) also investigated correlations between the use of the definite article and three specific syntactic environments where nouns are used (i.e., nouns in subject positions, object positions, and in prepositional phrases) but found no notable correlation.
5. As mentioned earlier, the present study will discuss only the results of analyses of definite and indefinite articles.
6. In fact, preliminary analyses of zero marking have found that generic

referents are highly likely to be marked with zero articles in IL grammars of both subjects.

VARBRUL weights for "zero articles" to mark generic referents:

| | Time 1 | Time 2 | Time 3 | Time 4 |
|---------|-------------|-------------|-------------|-------------|
| Akiko | 0.95 | 0.90 | 0.70 | 0.98 |
| Natsuko | 0.98 | 0.78 | 0.76 | 0.92 |

(All the weights are statistically significant.)

7. When a factor group includes either categorical use (100%) or non-use (0% or no token), VARBRUL weights cannot be calculated.
8. Akiko's Time 4 has only two error tokens, which are concerned only with FG-4 (Internal structure of NP: post-modifiers). Therefore, VARBRUL weights were not calculated.
9. However, the weights in Time 4 (Generic: 0.38; 1st Mentions: 0.63) are as strong as those of the other factor groups.
10. Natsuko began to overproduce DA with the sequence of adjective + noun in Time 3 (e.g., I want to go to the new place and meet new people...), for which I do not have any possible account to offer.
11. Only the statistically significant factor groups are listed in the tables.
12. In contrast, it seems that Natsuko has not mastered these rules so effectively as Akiko. Natsuko's error patterns are primarily derived from her imperfect command of DA with the head noun of the prepositional phrase (Time 1+2: 0.59; Time 3+4: 0.76) and the relative clause (Time 1+2: 0.87; Time 3+4: 0.31), though internal structure of NP itself has been found not to be a statistically significant constraint on her 'accurate' use of DA.
13. Generic referents are predominantly marked with zero articles in ILs of both subjects. See the result of preliminary analyses in Note 6.
14. Unlike the case of DA (Tables 8 and 9), I did not conduct VARBRUL analyses to demonstrate tendencies of contributions of intersecting factors on the production of IA errors. In both Akiko's and Natsuko's ILs, the total number of error tokens is much smaller than the DA

counterpart, and the sources of errors are concerned with so few members of the factor groups that VARBRUL analysis seems useless.

15. FG-2 (Count/non-count distinction and number of the noun marked), however, has not been found to be statistically significant on accuracy of IA. Akiko's weights for 'concurrences' of IA with the three types of nouns: 0.52 for singular nouns, 0.16 for non-count nouns, no use with plural nouns in Time 1+2, categorical use of IA with singular nouns in Time 3+4. Natsuko's weights: 0.49 for singular nouns, 0.79 for non-count nouns, no use with plural nouns in Time 1+2, 0.72 for singular nouns, 0.82 for non-count nouns, 0.13 for plural nouns in Time 3+4.