Interpreting morphological variability in adolescent Japanese-English interlanguage[1]

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Abstract

This study tests three proposed hypotheses for why second language learners produce variable forms of inflectional morphology (e.g., *She goes to bed at nine every night/She go to bed at nine every night*): the Minimal Trees Hypothesis, the Missing Surface Inflection Hypothesis, and the Prosodic Transfer Hypothesis. The source of evidence is written production data elicited from adolescent Japanese classroom learners of English: 90 junior high school students (1st-3rd grade/aged 13-16) and 30 university students (2nd year/aged 19-20). Results show a high level of accuracy in the suppliance of English regular past tense-*d*, plural-*s* and associated syntactic properties (such as overt subjects and Nominative Case marking) and also a lower production rate of subject-verb agreement morphology. This provides some evidence for a dissociation between syntax and morphology as well as possible first language (L1) effects, findings which are problematic for the claims of the Minimal Trees Hypothesis. A discrepancy was also found in suppliance between the same *-s* inflections of subject-verb agreement and plural marking in the written production data, which is not consistent with the Prosodic Transfer Hypothesis. The conclusion drawn is that the participants are probably having difficulty accessing morphological forms, which is consistent with the Missing Surface Inflection Hypothesis (MSIH).

[1] I would like to extend my deepest gratitude to Professor Roger D. Hawkins for supervising my research and guiding this paper. I sincerely thank Dr. Carol Jaensch and anonymous reviewers for their elaborate comments and helpful suggestions that greatly improved this paper. All remaining errors and oversights are my own.

1. Introduction

There has been much evidence showing that second language (L2) learners exhibit variable forms in the production of inflectional morphology (Haznedar, 2001; Lardiere 1998a, b, 2000; Hawkins, 2000; Prévost and White, 2000a, b; Robertson, 2000; Leung, 2001; Ionin and Wexler, 2002). L2 learners of English frequently produce utterances including omission (1a), overuse (1b, c) and substitution (1d) of verbal and nominal inflections.

1. a. She *go*_ to bed at nine every night. (No.3)[2][JH7th P12]

   b. He sometimes write***d*** letter_ last year. (No.36) [JH 7th P 6]

   c. She doesn't like milk***s***. (No.6) [JH 7th P 2]

   d. She often play***s*** _ piano last year. (No.2) [JH 7thP 7]

Considerable debate has recently focused on what causes such variability in morphology by L2 learners (Vainikka and Young-Scholten, 2005; Hawkins and Hattori, 2006; Hawkins, 2007; Tsimpli and Dimitrakopoulou, 2007; Goad and White, 2004; Lardiere, 2008, 2009). This is also a central question in the present study. In generative second language acquisition research, there have been two views. From one view, argued for by the Minimal Trees Hypothesis (Vainikka and Young-Scholten, 1996a, b), morphological variability reflects the non-acquisition of underlying syntactic knowledge. An alternative view, proposed by the Missing Surface Inflection Hypothesis (Lardiere, 1998a, b; Prévost and White, 2000a, b) and the Prosodic Transfer Hypothesis (Goad, White and Steele, 2003), is that morphological variability results from a difficulty with the production of morphological forms. In other words, the former view assumes that the variability is caused by the absence of functional categories in L2 grammar in the morphology-to-syntax mapping (e.g., Eubank, 1993/1994; Meisel, 1997), while the latter view maintains that morphological production is affected by some factors other than the impairment of syntactic knowledge, such as difficulty in accessing forms when there is communication pressure (the view of the MSIH), or difficulty in pronouncing

[2] Examples here are drawn from the test reported in the present article. 'No.' refers to the item number in the test, 'JH 7th' to Junior High School 7th grade and 'P' to participant.

forms (the view of the Prosodic Transfer Hypothesis). As several previous studies have already shown, failure to produce inflectional morphology is in contrast to success with associated syntactic properties regardless of the difference in the participants' L1, age, and stage of L2 grammatical development (Haznedar, 2001; Ionin and Wexler, 2002; Lardiere, 1998a, b; White, 2003a).

In this paper, elicited written production data is examined which was collected from L2 English classroom learners whose L1 Japanese is both similar to and different from English, as illustrated in Table 1.

Table 1 Comparison of properties between L2 English and L1 Japanese

				English SVO	Japanese[3] _OV
Morphology	Verbal	Agreement		+	-
		Past Tense	Regular Verbs	+	+ [-*ta*]
			Irregular Verbs	+	-
	Nominal	Articles	Definite	+	-
			Indefinite	+	-
		Plural		+	- / (+) [-*tati*]
Sytax	Word Order	Verb Raising (Main verbs)	Adverbs	-	?[4]
			Negation	-	?
	Question	Wh-movement		+	-
	Subject	Pro-drop		-	+

(S=subject, V=verb, O=object)

[3] -*ta*: Kudo, 1995; Kubo and Suwa, 2007. –*tati*: Ueda and Haraguchi, 2008 (see section 5.2).

[4] There has been little consensus about verb raising in head-final languages such as Japanese and Korean (Koizumi, 2000; Fukui and Sakai, 2003, a.o.).

It is argued that the findings in this study are consistent with the view of the Missing Surface Inflection Hypothesis that variability in morphology reflects a dissociation between target-like syntactic knowledge and a difficulty with the production of morphological forms. The focus is on comparing agreement morphology-*s* with: (1) related syntactic properties such as overt subjects and Nominative Case; (2) regular past tense morphology-*d*; (3) plural morphology-*s*. Anticipating the results, all of these properties clearly show higher production rates than agreement morphology. The differences in production provide evidence for a dissociation between syntax and morphology; the presence of a functional category; and possible L1 effects, which are fully consistent with the Missing Surface Inflection Hypothesis but not consistent with the Minimal Trees Hypothesis. In addition, there are differences in production between plural-*s* and agreement-*s* in this written production task, which is problematic for the assumptions of the Prosodic Transfer Hypothesis. It is proposed that the MSIH would need to be framed with regard to the complexity of the feature composition for abstract representations (Lardiere, 2000) in order to explain what causes the differences in production of the inflectional morphology which is the focus in this study.

The article is organised as follows. The next section describes the three hypotheses which are relevant to the two different ways of interpreting L2 morphological variability; Section 3 gives the details of the methodology; in Section 4, the results are presented; Section 5 is a discussion of the results; finally in Section 6, the conclusion is reached.

2. Three hypotheses for interpreting morphological variability

It is uncontroversial that L2 learners exhibit inconsistent use of inflectional morphology associated with functional categories. However, there has been little agreement as to the interpretation for such a phenomenon. In recent second language research studies, two different views have been proposed on the inconsistency in morphological production. One view is that optionality reflects the absence of abstract target-like morpho-syntactic representations, which is the claim of the Minimal Trees Hypothesis (Vainikka and Young-Scholten, 1996a, b). The alternative view is that optionality results from some factor other than morpho-syntactic knowledge, on which the Missing Surface Inflection Hypothesis (Lardiere, 1998a, b, 2000; Prévost and White, 2000a, b)

and the Prosodic Transfer Hypothesis (Goad, White and Steele, 2003; Goad and White, 2006) are based. In other words, the difference between the two views is whether L2 variability in morphology reflects the incompleteness of underlying syntactic representations or not.

2.1 The Minimal Trees Hypothesis

The Minimal Trees Hypothesis (Vainikka and Young-Scholten, 1996a, b), which has recently been renamed the 'Organic Grammar' approach (2005, 2007), proposes that L2 grammars at the initial state lack functional categories and the associated projections, like L1 initial grammars. This is an application of the Weak Continuity Hypothesis (Clahsen, Eisenbeiss and Penke, 1996; Clahsen, Ensenbeiss and Vainikka, 1994; Clahsen, Penke and Parodi, 1993/1994; Vainikka, 1993/1994) for L1 to L2 acquisition. Vainikka and Young-Scholten (1996a, b) claim that L2 input and overt morphology trigger the acquisition of functional categories: they develop gradually in a hierarchical order, drawn from the full inventory of Universal Grammar (UG)[5], not the L1 grammar. This suggests a close association between the acquisition of morphology and the emergence of functional syntax.

2.2 The Missing Surface Inflection Hypothesis

The Missing Surface Inflection Hypothesis (Lardiere, 1998a, b; Prévost and White, 2000a, b) proposes that L2 abstract morpho-syntactic knowledge has no impairment. Several recent studies have provided clear evidence for a dissociation between the inconsistent use of inflectional morphology and the presence of syntactic knowledge. Lardiere (1998a, b) reports that an L1 Chinese advanced proficiency speaker of L2 English produces various syntactic properties (overt subjects/Nominative Case; accusative pronouns; verb placement) more accurately than verbal inflections (subject-verb agreement and past tense). Related results are obtained by Haznedar (2001) in L1 Turkish child data: a discrepancy in production rate between verbal inflections (subject-verb agreement and past tense) and various syntactic properties (copula/auxiliary *be*; overt subject/Nominative Case). In the studies of Prévost and White (2000a, b), there was a divergence in accuracy between verb placement and verb form. Ionin and Wexler (2002) provided similar results from L1 Russian children learning Englishwho produce

[5] Innate universal linguistic principles assumed by Chomsky (1959, 1965, 1975, 1980, 1981a, b, 1986, 1999).

overt subjects and verb placement more accurately than subject-verb agreement inflection. All of the previous studies have found no randomness in morphological variability: variable use is confined to missing inflection, and does not involve faulty inflection. Such evidence is consistent with the claim that inaccuracy in L2 morphology is caused by learners having difficulty mapping from abstract categories and features to their surface morphological forms. In particular, Lardiere (2000:124) assumes that "complex "outer" layer mappings from morphology to PF" (phonetic form)[6] are problematic for L2 learners. This suggests that the complexity in mapping makes it difficult to produce L2 morphology consistently.

2.3 The Prosodic Transfer Hypothesis

The Prosodic Transfer Hypothesis (Goad, White and Steele, 2003; Goad and White, 2006) proposes that variable production of L2 morphology can be attributed to a transfer of L1 phonological representation. Like the Missing Surface Inflection Hypothesis, this claim also argues against any syntactic deficit in L2 grammars. However, the Prosodic Transfer Hypothesis assumes that if L1 inflectional morphology is prosodified differently to the L2, and L2 learners transfer their L1 prosody into their L2 grammars, this will influence their production of L2 morphology. Also, this may lead to failure to produce overt forms for morphological properties that are abstractly represented in their grammars. For example, Goad and White (2006) argue that Mandarin speakers' failure to supply English regular past tense and 3rd person singular present tense agreement morphology is caused by a different prosodificiation of morphological structure in the L1. In English, regular inflection is adjoined to the prosodic word (PWd), while irregular inflection is PWd-internal. By contrast, in Mandarin, all inflectional morphology is PWd-internal. This potentially makes inflected forms (e.g., *walked, builds*) unpronounceable for Mandarin speakers, coupled with the fact that there is a universal constraint on syllable codas that prevents the merger of more than two segments in a coda. Goad and White (2006) hypothesise that there are ways in which Mandarin speakers can 'accommodate' the overt inflections in some cases, but this leads to persistent variability in production.

[6] "PF-representation is a representation of the phonetic form of an expression" (Radford, 2009:478).

3. The present study

To further test the claims of the three hypotheses outlined in section 2, a study was undertaken with 120 adolescent L1 Japanese classroom learners of L2 English: 90 junior high school students (1st - 3rd grade/aged 13-16) to investigate L2 grammars at the initial state and in early development and 30 university students (2nd year/aged 19-20) in later development.

3.1 Methodology

This study differs from other previous L2 studies in data mode, the setting for L2 input, participants' L1 background, age, number, length of L2 exposure: the L2 data is written production data collected from 120 Japanese adolescent classroom learners of English at the initial and early transitional states[7], as illustrated in Table 2.

Table 2 L2 data collected in this study

L2 Data Mode	Setting[8] for L2 input	Interlanguage L1-L2	Age (years old)		Number of Participants	Length of Exposure/Residence
Written data	Formal	Japanese-English	13-20		120	8months-7.8years
			JH 7th	13-	30	8 months
			8th	14-	30	1.8 years
			9th	15-	30	2.8 years
			U 2nd	19-	30	7.8 years

(JH=Junior High School, U 2nd =University second year)

[7] The initial state is the earliest stages of L2 acquisition; the transitional state is the stages in which L2 grammar develops.

[8] There are two settings for L2 acquisition: a naturalistic setting and a formal setting . In the formal setting, L2 learners are exposed to L2 input via instruction in the classroom, in order to either learn the grammatical properties consciously or to practice the communication.

By contrast, as summarized in Table 3, five previous studies obtained L2 spoken production data in a naturalistic setting[9]. No study reports Japanese-English interlanguage data; the groups are mainly either adults or children[10]; the number of participants is less than 20 people; most studies examined the initial and end state[11] in L2 acquisition. In addition, comparing these previous L2 studies, there is further variation in the participants' L1, age, number, length of L2 exposure.

The properties investigated are drawn from both morphology and syntax properties in order to determine if there is a morphology-syntax correlation. Table 4 compares English with the various L1s in the previous studies (see Table 3) in terms of the four properties considered in this study: subject-verb agreement-s, regular past tense-d, plural marking-s, and subject suppliance/Case. This shows that Japanese has more differences from English than similarities, like Chinese and Korean (see the shaded areas in Table 4).

[9] In the naturalistic setting, L2 speakers are exposed to the L2 naturalistically outside the classroom.

[10] The definition of age groups (child/adult) in this study comes from the descriptions in each of the previous studies.

[11] The definition of L2 state (initial/end) in this study is also based on the descriptions in the previous studies. It is subject to change, depending on a number of different criteria, such as length of exposure to L2, frequency of the use, and proficiency level. There were some cases where different length of exposure to L2 was interpreted as the same state: White (2003b:92) points out that the adult learners in Epstein et al. (1996) "must be beyond an initial-state grammar" because some of them had 7 years' exposure to L2. The end state is the stage in which L2 grammar shows "lack of change over time" (White, 2003b:244).

Table 3 L2 data of previous studies[12]

Study L2 Data Mode	Setting for L2 input	Interlanguage L1-L2	Age (years old)	Number of Participants	Length of Exposure /Residence
Vainikka& Young-Scholten (1994, 1996a) *Spoken data*	Naturalistic	a.Italian/Spanish -German	15 - 53	11 (Ita4 /S7)	10 - 25months
		b.Turkish/Korean -German	28-60	17 (T11/K6)	1.5 – 24years
White & Prévost (2000a,b) *Spoken data*	Naturalistic	English-French	5	2	0.2 - 29months
		Italian-German	8	2	
		Arab-French;	'adult', 34	2	3 - 54.5months
		Por/Spa-German	17, 22	P1+G1	
Goad, White & Steele (2003) *Spoken data*	Naturalistic	Chinese-English	'adult'	12	0.5 - 5 years
Lardiere (1998a,b,2003) *Spoken data*	Naturalistic	Chinese-English	32/41 (two recordings)	1	10/18 years (two recordings)
White (2003a) *Spoken data*	Naturalistic	Turkish-English	50/51 (two recordings)	1	10/11.5years (two recordings)

(Ita=Italian, Spa/S=Spanish, T=Turkish, K=Korean, Por/P=Portuguese)

[12] Vainikka and Young-Scholten, 1994:271/272, 1996a:149; White & Prévost, 2000a:207/208, 211; Goad, White and Steele, 2003:254; Lardiere, 1998a:12/13; White, 2003a:129,133.
The description of '*adult*' was used instead of the specific age in each of the studies.
The studies of Lardiere (1998a,b; 2003) and White (2003a) are longitudinal: the L2 data were collected from one subject over 2 time periods.
This table excludes Goad and White's study (2006) because there are no descriptions of both age and length of exposure/residence: "Subjects were 10 intermediate level Mandarin-speaking leaners of English and 9 native English-speaking controls" (2006:6).

Table 4 Comparison of L1properties between this study and the previous studies[13]

	Morphology			Syntax
	Verbal		Nominal	Subject
	Agreement	Past	Plural	Pro-drop
English sVO	+	+	+	-
Japanese _OV	-	+	-/(+)[-*tati*]	+
Korean _OV	-	+	(+)	+
Chinese _VO	-	-	- /(+)[-*men*]	+
Turkish _OV	+	+	+	+
Italian _VO	+	+	+	+
Spanish _VO	+	+	+	+
French sVO	+	+	+	-
German sOV	+	+	+	-

3.2 Participants

All of the 120 adolescent participants in this study were L1 Japanese classroom learners of English from national and private educational institutions in urban areas of Japan. Data collected from the 90 junior high school students were expected to provide information about early L2 development; data collected from the 30 university students were expected to provide information about later development. The reason for testing junior high school students is because Japanese students start learning English in the first grade of junior high school, not of elementary school[14], which is equivalent to the 7th grade in the UK[15]. Two junior high schools and one university[16], after 6-months of

[13] Ueda and Haraguchi (2008:229): Japanese plural marker -*tati* and Chinese –*men* "are akin to each other in many ways"; the use is optional and restricted to human common nouns, proper nouns, and pronouns (see section 5.2).
Hawkins, 2001; Lardiere, 2007; Özsoy, 2009.

[14] Since April 2011, they begin learning English in the 5th grade of elementary school.

[15] The grade of junior high school students is shown by the grade in the UK hereafter in this paper.

[16] I am deeply grateful to be offered the headmasters' understanding of this research and the teachers and students' kind cooperation in this study.

difficult negotiations with ten schools[17], kindly agreed to participate in this study on condition that 1) the teachers in charge (not a research student) would collect the data in the English class; 2) the task (including the distribution of materials and instructions) would take less than 40 minutes because it is impossible to take more time out of their tight schedule; 3) the data would be written because it is impractical to collect spoken data which require much more time and effort in class; 4) no detailed information on the schools (e.g. location[18]) would be disclosed. Under these conditions for this study to be accepted, neither a proficiency test nor a spoken production test was allowed. Instead of a proficiency test, length of exposure to English and age (grade) were employed to divide the participants into four groups, each of which had the same number of participants (30 students): those who had received 8 months of classroom instruction in English prior to testing (1st grade junior high school students), those who had received 1.8 years (2nd grade students), those who had received 2.8 years (3rd grade students), and those who had received 7.8 years (2nd year university students). Their ages ranged from 13 to 20. Furthermore, several measures were taken to make the written data as reliable as possible. The number and age of participants were increased in order to fully observe gradual development in early stages of L2 acquisition and to compare with later development. The testing for all four groups was carried out in late January 2011, to make the difference in length of exposure to English regular (see Table 2). In the junior high schools[19], to investigate the English language-learning background, a linguistic background questionnaire was conducted: none of the participants had received intensive/regular English teaching before/after entering junior high schools in either Japan or English-speaking countries. For the university students, the TOEIC (Test of English for International Communication)[20] score (the latest score was between 650 and 680 in January 2011 when the TOEIC class finished and the test was conducted) was employed to replace a proficiency test. To avoid possible effects on the results, all of the university students, who had the same major (not English-related), had taken the same number of compulsory English classes in the 1st year and attended the same compulsory TOEIC classes in the 2nd year. The reason for testing the 2nd year university

[17] Both a pilot study and this study found it hard for a research student without any personal contacts to ask educational institutions for participation in experiments in Japan.

[18] English education in these schools is not influenced directly by regional boards of education.

[19] The two junior high schools were selected on the basis of similarity of deviation values to rule out other possible factors that might affect the results: a deviation value is the percentile a school ranks.

[20] A test that measures L2 learners' ability to understand (e.g. read/listen) English.

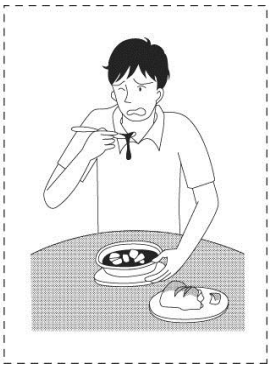
students is because the TOEIC classes are scheduled for the 2nd year in the university. In addition, three strategies were designed to ensure a greater quantity of written production data and that it was as spontaneous as possible (see section 3.4).

3.3 Materials

This study employed a picture-stimulus task to elicit written production data. The task contained 63 test sentences in Japanese, each of which was accompanied with a picture and several English words (one to three) to prompt the participants to produce English sentences: for this study, a total of 63 test sentences were created to cover 63 tokens (see Table 5) and each accompanied picture was selected[21] to match each test sentence. There were two types of test items: one was to ask the participants to write an English answer (see sample question 1) and the other was to ask them to form a question sentence (see sample question 2). The participants were instructed to write which kind of answer (either an answer or a question sentence) by a bracketed Japanese prompt after each test sentence, as shown in the sample questions below.

例題 (Sample questions)[22]

１． **栄作は昨夜ビーフシチューを食べましたか。（答え）**
Did *Eisaku* eat beef stew last night? (Answer)



No. beef stew, last night ⇒ (答え) He didn't eat beef stew last night.

(Answer)

[21] A Japanese website offers us a variety of pictures and sentences as Japanese teaching materials.
[22] English sentences are added for this paper: there was no English sentence in the actual task.

２．　**「玲子が昨日買った物」を尋ねて下さい。（疑問文）**
Please ask a question about what *Reiko* bought yesterday (Question).

Yesterday　　⇒(疑問文)What did she buy yesterday?

(Question)

As illustrated in Table 5, this task was made of 63 tokens designed to examine both morphological and syntactic properties associated with Tense Phrase (TP) (subject-verb agreement, tense markers, strength of inflection, null/overt subjects, Nominative Case), Complementiser Phrase (CP) (wh-movement) and Determiner Phrase (DP) (articles and plural inflection). In this article, attention is restricted to the analysis of subject-verb agreement, tense markers, overt subjects, Nominative Case in TP and a plural marker in DP in order to test the three hypotheses to interpret morphological variability.

Table 5 Distribution of properties designed in the elicited written production task

	Property			Tokens 63	Test item number1-63
Morphology	Verbal	3p pres	Main V	3	3, 27, 40
			Cop *be*	3	5, 12, 47
			Aux *be*	3	8, 33, 50
		3p past	Main V reg	3	10, 39, 56
			Main V irreg	3	17, 28, 43
	Nominal	Article	*the*	6	2, 4, 13, 40, 48, 60
			a	6	17, 19, 35, 50, 53, 54

			No Article		13	3, 8, 10, 15, 18, 21, 23, 31, 33, 39, 42, 43, 56
		Plural	*-s*		3	27, 46, 62
			No Plural		4	6, 30, 52, 58
Syntax	Word Order	3p pres	Neg	Main V	3	6, 42, 52
		3p past		Main V	3	15, 34, 48
		3p pres		Cop *be*	3	14, 37, 55
		3p pres		Aux *be*	3	20, 45, 53
		3p pres	Adv	Main V	3	18, 31, 62
		3p past		Main V reg	3	2, 21, 23
		3p past		Main V irreg	3	30, 36, 58
		3p pres		Cop *be*	3	25, 59, 61
	Question	3p pres	Who	Subject	3	4, 29, 35
				Object	3	1, 9, 57
			What	Subject	3	38, 44 49
				Object	3	11, 16, 22
		3p past	Who	Subject	3	13, 19, 46
				Object	3	41, 51, 63
			What	Subject	3	24, 54, 60
				Object	3	7, 26, 32
	Subject	Overt Subject		-	63	1 – 63
		Nominative Case		-	63	1 – 63

(3p=3rd person, pres=present tense; Cop=copula *be*, Aux=auxiliary *be*; reg=regular, irreg=irregular; Neg=negation, Adv=adverb)

In addition, a linguistic background questionnaire was conducted for the junior high school students. The questionnaire, which consists of 12 Japanese questions[23], was created to examine whether participants had had other intensive/regular exposure to English before/after entering junior high schools.

3.4 Procedure

The testing of all groups took place in the English class, where each teacher in charge collected the data[24]. Three strategies were used to ensure that the participants provided answers to all the questions in the test, and did so relatively spontaneously without drawing on their metalinguistic knowledge. These strategies were introduced specifically for the 7th grade participants, for whom the task of providing answers to 63 items in only 30 minutes was extremely demanding. The first strategy was to break the test into three sections: participants were asked to write 21 English sentences in 10 minutes in each of the three sections, and were informed when 5 and 10 minutes for each section had elapsed because there was no break between the sections. Secondly, participants were instructed to make their writings as spontaneous as possible. The participants were given only written instructions followed by two illustrative examples before the task (see section 3.3). They were asked to do four things: to answer one question in 20-30 seconds, to write whatever they first thought of without worrying about the correctness of their answers, not to erase their first answers, and to write '*Katakana*[25]' in Japanese or wrong spellings in case that they could not spell words. There were no detailed oral instructions on how to answer before or during the task. Finally, to get the participants focused on producing English sentences[26], all test sentences were described in Japanese and 10 English words (12.3% of the total English

[23] Due to the time limit set by the schools (see section 3.2), the questionnaire was designed to take 5 minutes to finish.

[24] The research student, not allowed to collect the data in class (see section 3.2), was given a prior opportunity to explain to the teachers in charge how the test would be carried out.

[25] The Japanese syllabary '*Kana*' (*Katakana*/*Hiragana*) represents 50 phonetic sounds: for example, a vowel such as '*a*' (ア/あ), a consonant-vowel combination such as '*ka*' (カ/か), and a nasal sonorant such as '*n*' (ン/ん). '*Katakana*' is used to transcribe foreign words into Japanese (e.g., カインド=*ka-i-n-do*='kind'; バイク=*ba-i-ku*='bike') and write loan words (e.g., アルバイト=*a-ru-ba-i-to* which is derived from 'arbeit'='part-time job'). By contrast, '*Hiragana*' is used to write function words that '*Kanji*' (=Chinese characters, e.g., 彼女/本/読) does not cover, e.g., 彼女が=*ga*/本を=*o*/読んでいる=*n-de-i-ru*='She is reading a book.'

[26] It is particularly time-consuming for Japanese initial learners to think of the spellings and meanings of English words.

prompt words) were accompanied by their Japanese meanings. The participants were told not to worry about spelling errors in the written instructions.

4. Results

The results in this study concern the four properties associated with TP (subject-verb agreement-*s* and past-tense marker-*d*; overt subjects and Nominative Case) and DP (plural marker-*s*). The findings provide evidence bearing on the three hypotheses for interpreting morphological variability (see section 2).

4.1 Agreement-*s* and overt subjects/Nominative Case

Table 6 shows a sharp contrast between subject-verb agreement-*s* and overt subjects/Nominative Case. Suppliance for agreement-*s* is lower than for overt subjects and Nominative Case, although it is assumed that both are determined by the Tense (T) category.

Table 6 Comparison of suppliance rate between agreement-*s* and overt subjects/Nominative Case (%) (Written data)

Proficiency Groups		Agreement-*s*	Overt subjects	Nominative Case
Junior High School (grade)	7th (n=29)	17.2	93.3	100
	8th (n=30)	46.7	90.0	100
	9th (n=30)	23.3	100	100
University (year)	2nd (n=30)	63.3	100	100
Total	n=119	37.6	95.8	100

In agreement-*s*, three kinds of unexpected forms are observed. The absence of a verb is found in the earliest learner group (2 a); by contrast, the misuse of copula (2 b) and past tense (2 c) are predominant in the subsequent proficiency groups.

2. Expected: She goes to bed at nine every night. (No.3)

   a. She _ nine bed every night. [JH 7th P23]

   b. She *is* in bed at nine every night. [JH 8th P2]

   c. She *went* to bed at nine every night. [JH 9th P8]/ [U2nd P10]

The Japanese adolescent L2 learners performed similarly to Turkish (Haznedar, 2001; White, 2003a), Chinese (Lardiere, 1998a, b; Goad, White and Steele, 2003), and Russian (Inonin and Wexler, 2002) L2 speakers, regardless of the difference in the participants' L1, age, number, length of L2 exposure, L2 input setting, and L2 data mode (see Tables 2 and 3), as summarized in Table 7.

Table 7 Comparison of suppliance rate in previous studies (%)[27](Spoken data)

Study	L1		Agreement-*s*		Overt subjects	Nominative Case
	Agree-ment	Pro-Drop				
Haznedar 2001	Turkish					
1 participant			46.67		99	99.9
Age: 4	+	+				
Initial						
White 2003a			1st	78.0	98.5	100
1 participant						
Age:50,51			2nd	81.5	99.4	100
End						
Lardiere1998a,b	Chinese		1st	4.76	98	100
1 participant			2nd	0.00		100
Age:32,41			3rd	4.54		100
End						

[27] Haznedar, 2001:12, 34, 37; White, 2003a:134/135; White, 2003b:189; Goad, White and Steele, 2003:255/256.
The descriptions are based on those from each of the previous studies (see footnote 10/11for the details).

Goad, White &Steele 2003 12 participants Age: '*adult*'	-	+	28		100
Ionin&Wexler 2002 20 participants Age: 3-13 Initial	Russian +	+	22	98	

The results in this study, as in the previous studies, clearly show a dissociation between the use of morphological forms and the acquisition of abstract syntactic representations. The high distribution of overt/Nominative subjects suggests that a functional category T[28] is present in their L2 grammar from early on, which is inconsistent with the Minimal Trees Hypothesis but consistent with the Missing Surface Inflection Hypothesis.

4.2 Agreement-*s* and regular past tense-*d*

Table 8 illustrates the suppliance rates of both subject-verb agreement and past tense marking. Suppliance for agreement-*s* is lower than for regular past tense-*d*, as in the comparison with overt subjects/Nominative Case (see Table 6).

Table 8 Comparison of suppliance rate between agreement-*s* and regular /irregular past tense (%) (Written data)

Proficiency Groups		Agreement-*s*	-	Regular-*d*	+	Irregular	-
Junior High School (grade)	7th	n=29	17.2	n=27	55.6	n=28	32.1
	8th (n=30)	46.7		50.0		36.7	
	9th (n=30)	23.3		56.7		40.0	
University (year)	2nd (n=30)	63.3		86.7		40.0	

[28] Functional categories (Tense, Complementiser, Determiner) head a projection but do not assign ϑ-roles. Tense (T) is the category that hosts the tense feature for the whole sentence (Adger, 2003:156,165).

Total		n=119	37.6	n=117	62.3	n=118	37.2

In both regular and irregular past tense contexts, unexpected forms are produced, regardless of proficiency level: faulty use of tense (3 a, b, c) and overuse of auxiliary *do/be* (4 a, b).

3. Expected: She played tennis yesterday. (No.39: Regular past tense)

   a. She ***was playing*** tennis yesterday. [JH 9th P12]

   b. She ***plays*** tennis yesterday. [JH 7th P3]

   Expected: He bought a ticket last week. (No.17: Irregular past tense)

   c. He ***buies*** *the* ticket last week. [JH 9th P4]

4. Expected: She played tennis yesterday. (No.39)

   a. She ***did*** *play* tennis yesterday. [U 2nd P26]

   Expected: He bought a ticket last week. (No.17)

   b. He ***is*** bought _ ticket last week. [JH 7th P28]

As summarized in Table 9, the previous L2 studies have similarly shown a divergence in suppliance between the two verbal inflections in the same functional category, although the learners have different L1 values for agreement and past tense, as well as age, number, and length of L2 exposure.

Table 9 Comparison of suppliance rate in previous studies (%)[29] (Spoken data)

Study	L1		Agreement-*s*		Regular Past tense-*d*	Irregular Past tense
	Agree-ment	Past tense				
Haznedar 2001 1 participant Age: 4 Initial	Turkish +	 +	46.67		25.65	40.59
Lardiere 1998a,b;2003 1 participant Age: 32,41 End	Chinese -	 -	1st 2nd 3rd	4.76 0.00 4.54	5.8	46.08
Goad, White &Steele 2003 12 participants Age: '*adult*'			28		57	78
Ionin&Wexler 2002 20 participants Age:3-13 Initial	Russian +	 +	22		42	

In addition, this study and some of the previous studies (Haznedar, 2001; Lardiere, 2003; Goad, White and Steele, 2003) similarly demonstrate a further distinction in suppliance within the category of past tense markers, regardless of the difference in the participants' L1, age, number, length of L2 exposure, setting for L2 input, and type of L2 data. The Turkish and Chinese L2 speakers produce irregular past tense more

[29] Haznedar, 2001:38/39; Lardiere, 2003:184; Goad, White and Steele, 2003:255; White, 2003b:189.

frequently than regular past tense-*d*. However, the Japanese L2 learners produce regular past tense-*d* more frequently than irregular past tense whose production rate is similar to agreement-*s*. They also produce some overuse cases of the regular -*d* marker, such as buy***ed***, take***d***, and wake***d***, given in 5 (a, b, c).

5. Expected: He bought a ticket last week. (No.17)

a. He buy*ed* _ ticket last week. [JH 7th P9]

b. He taked _ ticket last week. [JH 9th P24]

Expected: He got up at seven yesterday. (No.28)

c. He waked up at seven yesterday. [U 2nd P29]

Such variations in suppliance for these verbal forms may be attributable to L1 effects, which is not consistent with the Minimal Trees Hypothesis but consistent with the Missing Surface Inflection Hypothesis. This will be explored in detail in section 5.

4.3 Agreement-*s* and plural-*s*

Table 10 compares the suppliance for subject-verb agreement-*s* with that for plural-*s*. Suppliance for subject-verb agreement-*s* is lower than for plural-*s*.

Table 10 Comparison of suppliance rate between agreement-*s* and plural-*s* (%)(Written data)

Proficiency Groups		Agreement-*s*		Plural-*s*	
Junior High School (grade)	7th	n=29	17.2	n=27	85.2
	8th (n=30)	46.7		70.0	
	9th (n=30)	23.3		70.0	
University (year)	2nd (n=30)	63.3		73.3	
Total		n=119	37.6	n=117	74.6

By contrast, in Table 11, the spontaneous spoken data of White's study (2003a) show no difference in production between the two *-s* inflections.

Table 11 Comparison of suppliance rate in a previous study (%) (Spoken data)

Study	L1		Agreement-*s*		Plural-*s*
	Agree-ment	Plural			
White 2003a[30] 1 participant Age:50,51 End	Turkish		1st	78.0	87
	+	+	2nd	81.5	90

It seems plausible to assume that the high production appears to be affected by the presence of marking in L1, as in the comparison with past tense markers. This is against the Minimal Trees Hypothesis but supports the Missing Surface Inflection Hypothesis. Furthermore, the results of the written production task, which are not influenced by L1 phonological representation, clearly show that the same *-s* inflections were produced differently. This suggests that the discrepancy cannot be accounted for by the Prosodic Transfer Hypothesis (see section 5 for discussion).

5. Discussion

The findings in this study show that suppliance for subject-verb agreement-*s* is lower than for overt subjects/Nominative Case, regular past tense-*d*, and plural-*s*. The differences in production suggest a dissociation between syntax and morphology, the presence of possible L1 effects, and the absence of L1 prosodic transfer.

[30] White, 2003a:136.

5.1 The relation between morphological variability and syntactic knowledge

The contrasting results between syntactic and morphological properties are inconsistent with the Minimal Trees Hypothesis, which claims that functional categories are absent because the acquisition of morphology triggers that of syntactic knowledge as in L1 acquisition. The early and near perfect production rate of overt subjects and Nominative Case provides robust evidence for the presence of functional categories with specified features. It is assumed that L2 learners construct an L2 grammar where the Tense category requires an overt specifier to be produced and assigns it Nominative Case from a very early stage of development. This suggests that a low level of subject-verb agreement production, regardless of being in the same functional category, does not correlate with the acquisition of syntactic knowledge. The discrepancy in production suggests a dissociation between syntax and morphology, which is consistent with the claims of the Missing Surface Inflection Hypothesis. This is a finding which is also replicated in the previous studies of other L2 speakers whose L1 background, age, length of L2 exposure, L2 input setting, and L2 data mode are totally different (see Tables 6 and 7 in section 4.1).

5.2 Possible L1 effects and the complexity of feature composition

This study found variable production rates of inflectional morphology: subject-verb agreement-*s*, regular past tense-*d*, and plural-*s*. The higher production rate of regular past tense-*d* and plural-*s*, compared with agreement-*s*, suggests a possible L1 effect, which is inconsistent with the Minimal Trees Hypothesis. This suggests that the production rate depends on whether the L1 has corresponding overt morphological forms (exponents of functional categories). For example, Japanese has only a regular past tense form: a suffix-*ta*, like -*d* in English, is always inflected to indicate past tense on verbs (Kudo, 1995; Kubo & Suwa, 2007). This might cause the divergence in production between the two past tense forms (regular>irregular) (see Table 8 in section 4.2) and the overuse of regular past tense-*d* in irregular past tense form contexts (see example 5 in section 4.2). Japanese also has an optional plural marker-*tati*, which is a suffix like English -*s*, but is limited to human common nouns (‘*gakusei*’-*tati* ‘students’),

proper nouns ('*Taro'-tati* 'Taro and his group'), and pronouns ('*watashi'-tati* 'we') (Ueda & Haraguchi, 2008). By contrast, Japanese has no overt subject-verb agreement morphology. The previous studies show similar results to this study, although the participants' L1, age, length of L2 exposure, L2 input setting, and L2 data mode are contrasting. The difference in the morphological paradigm between L1 and L2 influences a variety of morphological production rates: the L1 Japanese and Chinese produce agreement-*s* differently to the L1 Turkish speakers (see Tables 6 and 7 in section 4.1), regardless of the similar production rate of syntactic properties. This is consistent with the Missing Surface Inflection Hypothesis which proposes that morphological variation is attributed to unimpaired L2 grammar but difficulties with mapping from abstract syntax to superficial realization of morphology. In addition, the lower production of subject-verb agreement-*s* can be accounted for by the complexity of feature composition: the L1 Turkish and Russian child speakers show a lower level of agreement production, regardless of the presence of L1 agreement morphology (see Table 7 in section 4.1). The agreement features have "multiple layers of complexity" (Lardiere, 2000:124)[31], which are obstacles to mapping from syntactic features to morphological forms. This account can possibly explain the difference in production rate among these three inflections across studies.

5.3 L1 Prosodic structure

This study shows that Japanese L2 adolescent learners produce plural-*s* more frequently than subject-verb agreement-*s*. The divergence in production rate between the same -*s* inflections is inconsistent with the Prosodic Transfer Hypothesis, which proposes that variable L2 production of morphology can be accounted for by L1 prosodic constraints. Given that L2 English inflection is prosodified in the same fashion (adjunction to the PWd), the same L2 English -*s* inflections, as well as -*d*, are expected to be produced in equal proportions by L2 speakers. For example, a Chinese L2 advanced speaker (reported in Lardiere, 2003) shows a similar low production rate in both agreement -*s* and regular past tense-*d* (see Table 9 in section 4.2): the Prosodic Transfer Hypothesis (Goad, White and Steele, 2003) argues that her interlanguage grammar allows no adjunction structure required by L2 English inflection. This suggests that the

[31] In a series of recent studies (2007, 2008, 2009), Lardiere proposes that L2 learners face difficulties in re-assembling L1 features into L2 lexical items: The Feature Reassembly Hypothesis.

Prosodic Transfer Hypothesis concerns the role of L1 prosody in L2 speech production, which is assumed to have no effect on written production. However, the Japanese L2 learners in this study show different suppliance of the three kinds of inflections in the written production task (see Tables 8 and 10 in section 4.2/4.3). Such a difference in suppliance would not be explained even if Japanese verbal inflection[32] shared the same prosodic structure as either English or Chinese: if it were PWd-external like English regular inflection, no asymmetry would be observed between two affixal forms (*-s*/*-d*) and agreement *-s* would be more accurate than irregular past forms; if it were PWd-internal like Chinese and English irregular inflection, irregular forms would show better performance than the other two verbal affixes. This suggests that the discrepancy may be attributable to other factors than L1 prosodic role. This is a finding similar to Snape's study (2007) that tests the Prosodic Transfer Hypothesis, based on spoken production data on L1 Japanese' English article use. The different production rates can be explained not by the Prosodic Transfer Hypothesis, but by the account of the complexity of feature composition within the framework of the Missing Surface Inflection Hypothesis (see section 2.2/2.3).

6. Conclusion

This study contributes to testing three hypotheses about the interpretation of L2 learners' varied performance in the production of inflectional morphology. The findings drawn from the written production of 120 L1 Japanese L2 English learners clearly show similarity to those from the spoken production data in the other previous studies, regardless of the difference in participants' L1, age, number, and L2 input setting. First, the early and high distribution of overt subjects/Nominative case provides strong evidence for a dissociation between syntax and morphology and the presence of L1 functional categories, which is not consistent with the Minimal Trees Hypothesis. Second, the lower suppliance of agreement-*s*, compared to plural-*s* and regular past tense-*d*, might be attributed to processing problems, caused by the complexity of feature composition and possible L1 effects. Such different production rates of the three inflections cannot be predicted by the Minimal Trees Hypothesis and the Prosodic Transfer Hypothesis. The findings in this study suggest that the variability of L2

[32] Dintrans (2011:56) assumes that "Japanese past morphology is internal to the PWd."

inflectional morphology is correlated to difficulties with mapping from abstract syntactic knowledge to overt morphological forms, not to impairment of L2 grammar. This provides evidence for the Missing Surface Inflection Hypothesis (Lardiere, 1998a, b, 2000; Prévost and White, 2000a, b). The conclusion leads to a closer examination of how the difference in features between L1 and L2 plays a role in variable L2 representation and of how semantic, phonological, and morphosyntactic features interact. This knowledge would be beneficial to L2 learners who face difficulties in written and spoken productions.

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