The Production of Japanese Verb-Verb Compounds by English, Chinese, and Korean Speakers: A Corpus Study

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1. Introduction

One of the central issues in second language acquisition (SLA) research is to make clear how and why second language (L2) learners' grammars change over time (Gregg, 1996). Studies conducted so far have repeatedly shown that L2 learners' grammars do not develop in an across-the-board fashion, but rather that properties inherent in one particular component (e.g., Syntax) seem to be acquired faster than those peculiar to other components (e.g., Morphology) (e.g., Lardiere, 1998). However, this purported development is inferred mainly from observations that properties of one component are ultimately acquirable but those of other components are not, and there are not so many studies (e.g., Clahsen, 1999) that closely investigate how properties of distinct components actually develop over time.

The acquisition of Japanese verb-verb compounds (VVCs) is an interesting research area especially in this respect because some VVCs are stored in Lexicon while others are constructed in Syntax, even though their surface structures are invariable (Kageyama, 1993; see also §2). Thus, a close investigation on how L2 learners' knowledge and use of two types of VVCs change over time will allow us to understand how the acquisition of properties in distinct components proceed and what properties are easy (or difficult) to acquire. However, most SLA studies on Japanese VVCs are pedagogical (e.g., Baek, 2005; Matsuda, 2002), focusing on L2 learners' knowledge about specific items (usually, semantically idiosyncratic ones) and/or on errors L2 learners make, without examining L2 learners' actual use of VVCs and its development. Furthermore, because they limit themselves to a few specific items, previous studies rarely take a systematic

distinction among VVCs into consideration.¹ To the best of our knowledge, Chen (2010) is the only existing study that takes up these issues seriously, investigating L2 learners' actual use of two types of VVCs and its development over time through two learners' corpora (the *KY Corpus* and the *Sakubun Taiyaku DB*). Although Chen's approach is moving toward the right direction for better understanding L2 development, she paid no attention to an important factor, the role of learners' first language (L1), having collapsed data from L2 learners with different language backgrounds.² Hence, how L2 learners' use of two types of VVCs changes over time is far from clear at the moment. As a part of a larger project that investigates development of L2 learners' knowledge and production of two types of Japanese VVCs, this paper examines the use of syntactic VVCs and lexical VVCs by English, Chinese, and Korean native speakers with different levels of proficiency in Japanese, focusing especially on how their use changes throughout the course of development and in what respect the use of VVCs differs among learners with different L1s.

This paper is structured as follows: §2 discusses the properties of Japanese VVCs and corresponding expressions in English, Chinese, and Korean. Then, §3 presents the relevant data found in two corpora: the *Uemura Corpus* (Uemura, 1998) and the *KY Corpus* (Kamada & Yamauchi, 1999). Finally, §4 discusses our own results.

2. Background: Cross-linguistic Distribution of VVCs

This section briefly discusses the properties of Japanese VVCs and comparable linguistic phenomena in English, Chinese, and Korean.

2.1. Japanese

VVCs are verbs resulting from the concatenation of two verbs without the assistance of an additional morpheme such as conjunction. Japanese VVCs consist of a non-finite verbal stem and a verb with tense (e.g., *tabe-hazime-ru* [eat-begin-PRES] 'begin to eat'; *nak-i-hazime-ru* [cry-begin-PRES] 'begin to cry').³ Although their surface forms are

¹ Few exceptions are Akimoto, Hokari, & Kumagami (2012), Hirakawa, Fujisaki, & Oshima-Takane (2010), and Terada (2001).

² In her earlier work (Chen, 2007), she pays attention to the role of learners' L1 in development of L2 learners' use of VVCs, examining the KY Corpus. However, she did not distinguish two types of VVCs in this study. In addition, her ways of analyzing/presenting data on development of L2 VVCs are problematic, because she collapsed one factor (e.g., differences in learners' proficiency in L2) when she analyzed another factor (e.g., differences in learners' L1).

³ When a first verb (V_1) ends with a consonant, *-i* is inserted. Following Poser (1984), we assume that *-i* is not a conjunction but an epenthetic vowel to avoid consonant clusters.

constant, it is widely accepted that Japanese VVCs are divided into two groups based on the component from which they originate (Kageyama, 1993): VVCs derived in Syntax (syntactic VVCs: SVVCs) and those stored in Lexicon (lexical VVCs: LVVCs). Because of this division by components, different syntactic as well as semantic behaviors are observed between the two types of VVCs. For instance, since SVVCs are formed in Syntax (via Merge and Move), their meaning is compositional/transparent, as illustrated in (1). In contrast, such transparent meaning is not always guaranteed with LVVCs. Their meaning is often unpredictable from their parts, as shown in (2).

b. tori-hazime-ru	c. kai-oe-ru
take-begin-PRES	buy-finish-PRES
'begin to take'	'finish buying'
b. tori-simar-u	c. kai-kabur-u
take-tighten-PRES	buy-wear-PRES
'crack down on'	'overestimate'
	 b. tori-hazime-ru take-begin-PRES 'begin to take' b. tori-simar-u take-tighten-PRES 'crack down on'

As a by-product of compositionality, SVVCs are more productive than LVVCs. Verbs typically appearing as a second verb (V_2) in SVVCs, such as *tuzuke*- 'continue' in (3), can combine with a number of different verbs, whereas verbs typically used as V_2 in LVVCs, e.g., *sakeb*- 'scream' in (4), cannot.⁴

(3) a. naki-tuzuke-ru	b. warai-tuzuke-ru	c. yorokobi-tuzuke-ru
cry-continue-PRES	laugh-continue-PRES	be glad-continue-PRES
'continue to cry'	'continue to laugh'	'continue to be glad'
(4) a. naki-sakeb-u	b. *warai-sakeb-u ⁵	c. *yorokobi-sakeb-u
cry-scream-PRES	laugh-scream-PRES	be glad-scream-PRES
'cry out'	'laugh and scream'	'exclaim with delight'

⁴ Apart from compatibility in meaning, the component verbs of LVVCs are restricted in terms of argument structure: Component verbs of LVVCs must share AGENT due to *Transitivity Harmony* (Kageyama, 1993) or *Obligatory Subject Sharing Principle* (Yumoto, 1996). Because of this constraint, transitive-transitive (e.g., *uti-otos-u* [hit-drop-PRES] 'beat down') and unergative-transitive (e.g., *naki-otos-u* [cry-drop-PRES] 'persuade *sb* in tears') pairs are licit LVVCs but pairs with unaccusative-transitive (e.g., *kuzure-otos-u* [collapse-drop-PRES]) are not. This restriction does not apply with SVVCs (e.g., *kuzure-tuzuke-ru* [collapse-continue-PRES] 'continue to collapse').

⁵ It is not clear whether (4b) and (4c) cannot be produced as outputs of grammars or whether they are accidental gaps. We leave this issue open here.

Though compositional meaning and productivity are matters of degree and exceptions do exist (e.g., *osi-ake-ru* [push-open-PRES] 'open *sth* by pushing it' is a compositional/ transparent LVVC; V-*kom-u* [V-insert-PRES] 'thoroughly V' is a highly productive LVVC), the most striking difference between SVVCs and LVVCs is the applicability of syntactic operations changing the internal structures of VVCs. Since LVVC formation *precedes* any syntactic operation, no syntactic operation, such as substitution, honorification, or passivization, can apply (Kageyama, 1993). By contrast, such an ordering problem does not arise in SVVC formation, and hence, parts of SVVCs are accessible to syntactic operations (Kageyama, 1993). Examples (5) and (6) illustrate this contrast.

- (5) a. Tarô-wa hon-o yomi-dasi-ta. Hanako-mo sô-si-dasi-ta.⁶ (Substitution) Taro-TOP book-ACC read-begin-PAST Hanako-too so-do-begin-PAST
 'Taro began to read a book. Hanako did so, too. / Hanako began to do so, too.'
 - b. Sensê-ga hon-o **o-yomi-ninari-dasi**-ta. (Honorification) teacher-NOM book-ACC HON-read-HON-begin-PAST 'The teacher began to read a book.'
 - c. Yôyaku, kono-ronbun-mo seken-ni **yom-are-dasi**-ta. (Passivization) at last this-paper-too the public-by read-PASS-begin-PAST 'At last, this paper began to be read by the public.'
- (6) a. *Tarô-wa naki-saken-da. Hanako-mo sô-si-saken-da. (Substitution) Taro-TOP cry-scream-PAST Hanako-too so-do-scream-PAST 'Taro cried out. Hanako did so, too.'
 b. *Sensê-ga o-naki-ninari-saken-da. (Honorification) teacher-NOM HON-cry-HON-scream-PAST 'The teacher cried out.'
 - c. *Tarô-wa musuko-ni **nak-are-saken-**da. (Passivization) Taro-TOP son-by cry-PASS-scream-PAST 'Taro had his son cry out.'

⁶ Some V₂ behaves as either lexical or syntactic depending on what meaning it adds onto V₁. For instance, *das*- meaning 'begin' as in (5) is considered as V₂ forming SVVCs, while it meaning 'let out' (e.g., *osi-das-u* [push-let out-PRES] 'push out') is categorized into V₂ forming LVVCs, being insusceptible to syntactic operations (e.g., **o-osi-ninari-dasi-ta* [HON-push-HON-let out-PAST]).

In sum, Japanese VVCs are divided into two types: SVVCs and LVVCs. The remainder of this section examines whether this distinction among VVCs is found in English, Chinese, and Korean.

2.2. English

It is generally accepted that English does not have productive VVCs comparable to those in Japanese, at least the ones formed by concatenation of two verbs without the assistance of an additional morpheme (e.g., Kageyama, 1993; Lieber, 2005; Nicholas & Joseph, 2009; Yumoto, 2001, 2005). Following this literature, we also assume that English lacks VVCs. Although there are a few exceptions (e.g., *stir-fry; freeze-dry*), which are 'harder to form and relatively unproductive' (Lieber, 2005: 375–376), the meanings conveyed with Japanese VVCs are often expressed in English through either V+ infinitive/gerund sequences as in (8) or verb-particle combinations as in (10).⁷

(7) Japanese	(8) English
a. tabe-hazime-ru [eat-begin-PRES] 'begin eating/to eat'	a. begin eating/to eat
b. kai-oe-ru [buy-finish-pres] 'finish buying'	b. finish buying
(9) Japanese	(10) English
a. koroge-oti-ru [roll-fall-pres] 'roll down'	a. roll down
b. aruki-mawar-u [walk-turn-pres] 'walk around'	b. walk around

2.3. Chinese

(Mandarin) Chinese allows productive VVCs. Chinese VVCs are classified into four types: Phase, Resultative, Directional, and Parallel (Li & Thompson, 1981; Yin, 2010). The examples below are based on examples and arguments in Yin (2010).

(11) Phase VVC (V_1 describing an action + V	V_2 denoting the phase of the action)
a. chi-wan [eat-finish] 'finish eating'	a'. chi-de/bu-wan
b. zhan-zhu [stand-hold on] 'stand still'	b'. zhan -de/bu- zhu

⁷ In what respect English V+infinitive/gerund sequences are similar to/different from Japanese VVCs (in particular, SVVCs) seems almost entirely neglected in the literature and surely worthy of investigation. Since this issue requires a detailed analysis of the structures of Japanese (S)VVCs, an issue beyond of the scope of this paper, we leave this open for future research.

(12) Resultative VVC (V_1 describing an action + V_2 denoting the result of the action)					
a. kan-dao [look-reach] 'see'	a'. kan -de/bu-d ao				
b. da-sui [hit-break] 'break'	b'. da -de/bu- sui				
(13) Directional VVC (V_1 : motion verb + V_2 denoting	the path/direction of the motion)				
a. na-lai [carry-come] 'bring'	a'. na -de/bu- lai				
b. ban-qu [move-go] 'take away'	b'. ban -de/bu- qu				
(14) Parallel VVC (V_1 and V_2 are synonymous or simil	lar in meaning)				
a. gou-mai [purchase-buy] 'buy'	a'. *gou- de/bu- mai				
b. chu-ru [exit-enter] '(have) differences'	b'. *chu-de/bu-ru				

The meanings of the first three types of VVCs are largely transparent (Yin, 2010). More importantly, it is possible to separate their parts, say, by inserting *de* 'achievable' or *bu* 'not.' Though the range of items that can intervene amid component verbs varies (Yin, 2010), the applicability of operations affecting their internal structures suggests that these are SVVCs (Kimura, 2007; Shen & Lin, 2005; Yin, 2010). Parallel VVCs are also transparent in meaning as in (14a), but some are opaque as in (14b). Unlike other VVCs, they are impervious to intrusion by items like *de/bu*, suggesting that they are LVVCs. Thus, Chinese has two types of VVCs, like Japanese, but most of them are syntactic.

2.4. Korean

Korean is another language that allows VVCs. The examples in (15) are from Y.-S. Kim (1984: 155) cited from Chung (1993: 44).

(15) a. tol-po-	b. ttwi-nol-	c. pil-pwuth-
turn around-see-	run-play-	beg-stick-
'(to) look after'	'(to) skip about'	'(to) fawn (upon)'

As the glosses indicate, the meanings of these compounds are largely opaque.⁸ In addition, as argued in Wada (2011a), these VVCs are immune from any syntactic operation that affects their parts, e.g., particle insertion (16) or V_1 substitution (17).

⁸ Note, however, that transparency in meaning is a matter of degree and indeed there are some VVCs whose meanings are relatively transparent (e.g., (16) and (17)). Thus, what is crucial to the present discussion is whether syntactic operations can be applied to the internal structures of the VVCs.

(16)	a.	ay-tul-i		kyeytan-ul		olu-(*to) nali-ess-ta.		
		child-PL-NC	ЭM	staircases-ACC		go up-(also) go down-PAST-DEC		
		'Children e	ven	went up and	dowr	n the stairs.'		
	b.	ay-tul-i		kyeytan-ul		olu-(*nun) nali-ess-ta.		
		child-PL-NC	ЭM	staircases-A	CC	go up-(CONT) go down-	PAST-DEC	
		'Children w	vent	up and down	the s	stairs.'	(Wada, 2011a: 83	5)
(17)	ay-	tul-i	ky	eytan-ul	olu-	nali-ess-ta.		
	chi	ld-pl-nom	sta	ircases-ACC	go u	ip-go down-PAST-DEC		
	*el	un-tul-to	ke	ytan-ul	kule	e-nayli-ess-ta.		
	ac	lult-PL-also	sta	ircases-ACC	do s	o-go down-PAST-DEC		
	'Cl	nildren went	up a	and down the	stairs	s. Adults did so, too.'	(ibia	l.)

The semantic opacity and inaccessibility of their internal structures both suggest that LVVCs exist in Korean (Chung, 1993; Kang, 1993; T.-S. Kim, 2011).

On the other hand, there seems no compelling evidence for SVVCs in Korean (Tsukamoto, 1995, 1997; Wada, 2011a). Indeed, the same meaning conveyed in Japanese through SVVCs is usually expressed in alternative ways, e.g., periphrastic constructions (19a) or adverbs (19b).⁹

(18) Japanese (Wada, 2011a: 95)	(19) Korean (<i>ibid</i> .)
a. yomi-hazime-ta	a. ilk-ki sicak-hay-ss-ta
read-begin-PAST	read-COMP begin-do-PAST-DEC
'began to read'	'began to read'
b. yomi-tuzuke-ta	b. kyeysok ilk-ess-ta
read-continue-PAST	continuously read-PAST-DEC
'continued to read'	'continued to read'

2.5. Summary

We have seen thus far that the four languages under investigation have the following properties with respect to VVCs.

⁹ Korean has another type of compound-like expressions: V-e+V. A subset of V-e+V is semantically transparent and does allow syntactic operations to apply to their part (Wada, 2011a). As argued in Wada (2011a, 2011b), however, the syntactic and semantic behaviors of Korean V-e+V are strikingly similar to those of Japanese V-te+V compounds rather than (true) VVCs dealt with in this paper. Thus, we tentatively conclude that SVVCs, at least those equivalent to Japanese SVVCs, are unavailable in Korean.

VVC Type	Japanese	English	Chinese	Korean
SVVC	✓	*	\checkmark	*
LVVC	\checkmark	*	\checkmark	\checkmark

Table 1. Cross-linguistic Distributions of SVVCs and LVVCs

We must admit, however, that the behaviors of VVCs are far more complicated than we have seen here, and accordingly, more fine-grained comparisons are ultimately required. Nevertheless, these typological differences are likely to be a useful starting point to understand L2 learners' behaviors. We will discuss later how these cross-linguistic differences seem to more or less affect the use of L2 VVCs.

3. Present study

3.1. Aims

The aim of this study is to examine the use of Japanese SVVCs and LVVCs by L2 learners with different L1s: English, Chinese, and Korean. In particular, we investigate (i) how L2 learners' use of VVCs changes during the course of L2 development and (ii) whether their use differs among learners from different language backgrounds.

3.2. Method

3.2.1. Corpora

We examined Japanese natives' and L2 learners' use of Japanese VVCs in the *Uemura Corpus* (Uemura, 1998)¹⁰ and the *KY Corpus Ver. 1.1* (Kamada & Yamauchi, 1999)¹¹, respectively, both of which employ *Oral Proficiency Interview* (OPI)¹² for data collection. The Uemura Corpus consists of 54 interviews with Japanese natives (and 56 interviews with non-native speakers of Japanese). We limited our analyses to 40 interviews collected at International Christian University, Tokyo, Japan. The KY

¹⁰ The Uemura Corpus was supported by a Grant-in-Aid for Scientific Research on Priority Areas 'Humanities and Computers' (A, 10111106) from the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) of Japan to the project titled *Nihongo kaiwa dêtabêsu-no kôtiku-to danwa bunseki* (Principal Investigator: Ryuichi Uemura).

¹¹ The KY Corpus was supported by a Grant-in-Aid for Scientific Research (A, 08308019) from MEXT of Japan to the project titled *Dainigengo-to siteno nihongo-no syûtoku-ni kansuru sôgô kenkyû* (Principal Investigator: Hiroko Quackenbush).

¹² OPI is a standardized testing method that measures how well a person speaks a language. OPI takes the form of a conversational interview and assesses a test-taker's speaking ability under specified criteria. OPI was developed by the American Council on the Teaching of Foreign Language (ACTFL). For details of data collection and assessment procedures, see Makino, Kamada, Yamauchi, Saito, Ogiwara, Ito, Ikezaki, & Nakajima (2001).

Corpus includes 90 interviews collected from 30 English-, 30 Chinese-, and 30 Korean-speaking learners of Japanese. Collected interviews were categorized into four groups depending on the interviewees' general proficiency in Japanese as assessed by standardized OPI assessment procedures. The classification of L2 learners in the KY Corpus is given in Table 2.¹³ We analyzed all the interviews in the KY Corpus.

Lear	ners' L1	Novice	Intermediate	Advanced	Superior
English	(<i>N</i> = 30)	5	10	10	5
Chinese	(N = 30)	5	10	10	5
Korean	(N = 30)	5	10	10	5

Table 2. Classification of Learners in the KY Corpus

3.2.2. Data Selection

We first prepared transcripts decomposed into morphemes with their grammatical information. For the Uemura Corpus, we extracted the interviewees' speech and then parsed them with *ChaSen (WinCha2000)*.¹⁴ For the KY Corpus, we employed transcripts already parsed (the *Tagutuki KY Corpus*: Lee, 2009).¹⁵

Next, we counted the numbers of (i) morphemes, (ii) verbs, (iii) VVCs, and (iv) SVVCs and LVVCs, following the procedures below.

- Proc. 1: We counted the numbers of morphemes in the transcripts, excluding those with the following tags, because they are not produced spontaneously.
 - a. Fillers (e.g., *anô* 'well,' *ê* 'um') b. Unknown words
 - c. Interjections (e.g., hai 'yes,' kon-nitiwa 'hello,' arigatô 'thank you')
 - d. Symbols and Punctuation marks (e.g., (), /, *, .)
 - e. Poses f. Non-verbal information (KY Corpus only)
 - g. Interviewer's speech (KY Corpus only) h. EOS (i.e., End of Speech)

¹³ According to the OPI assessment procedures, Novice and Intermediate groups are divided into three subgroups: Novice-Low/-Mid/-High and Intermediate-Low/-Mid/-High. Though L2 learners' proficiency is specified in this way, these subgroups are collapsed in the KY Corpus.

¹⁴ ChaSen is a morphological parser for Japanese. It was developed in the Matsumoto Laboratory, Nara Institute of Science and Technology. *WinCha2000* is a Windows version of *ChaSen*.

¹⁵ These transcripts are also parsed with *ChaSen*. However, since L2 learners' speech includes errors, unexpected parsing was corrected later by hand. Accordingly, the parsing procedures differ slightly and information that is not found in the Uemura Corpus is included. However, the procedures are basically the same; hence, these differences do not affect our analyses.

- Proc. 2: We counted the numbers of morphemes labeled as verbs.
- Proc. 3: We counted verb sequences (i.e., VVCs) among verbs. We did not regard them as VVCs when (i) they are used as nouns, and (ii) they are repetitions of a previously produced VVC. We considered an apparent verb sequence as a noun when its second verb takes its *ren'yô-form* and is followed by a case marker/postposition or by a copula/light verb. Whether a verb sequence is a repetition or not is carefully checked one by one.
- Proc. 4: We divided the VVCs into SVVCs and LVVCs following Kageyama's (1993) tests (i.e., substitution, honorification, and passivization), and then calculated their numbers. We regarded a VVC as an SVVC when it passes at least one of the tests; otherwise, we considered it an LVVC.¹⁶

Finally, in order to control for differences in lengths of interviews, we limited our analyses to VVCs included in the first 1,600 morphemes, from which the first 100 morphemes were subtracted (i.e., 1,500 morphemes in total).¹⁷ In accordance with this criterion, we excluded from analysis 23 Japanese, 14 English, 11 Chinese, and 14 Korean speakers whose number of morphemes did not reach 1,600.¹⁸

3.3. Results

Table 3 summarizes the numbers of verbs, VVCs, SVVCs, and LVVCs. Native speakers of Japanese produced 3.9 VVCs per person ($\Sigma = 66$). VVCs were also found among L2 learners as well (2.4 per person: $\Sigma = 124$). Though the numbers of VVCs in any Intermediate group were as few as around 1.0 per person, their rates continued to increase as proficiency in L2 increased, and reached 3.0 (English), 4.6 (Chinese), and 4.8 (Korean) in Superior groups. These results show that the production of VVCs increases as learners' proficiency in L2 increases.

¹⁶ Note that some V_2 is categorized into either SVVC or LVVC depending on its meaning (e.g., *das-* 'begin'). Therefore, we carefully categorized VVCs referring to contexts. Lists of SVVCs and LVVCs produced by L2 learners are available in Appendices.

¹⁷ Each conversation of OPI starts with greetings and self-introduction. Since these utterances are likely to include many fixed expressions, we subtracted the beginning of the conversation. In addition, we analyzed 1,501 morphemes when the component verbs were parsed separately and extended to the 1,601st morpheme. This was applied to one Chinese Superior learner (CS01).

¹⁸ All of the Novice learners were excluded due to this procedure.

Learners'	L1	Ve	Verb VVC		VVC		VVC SVVC		LV	VC
&		Total	Per	Total	Per	Total	Per	Total	Per	
Level of Jap	anese	Total	Person	10001	Person	Total	Person	Total	Person	
Japanese ($N = 17$)									
Native		3,778	222	66	3.9	10	0.6	56	3.3	
English ($N = 16$)										
Intermediate	(<i>n</i> = 3)	540	180	3	1.0	0	0	3	1.0	
Advanced	(<i>n</i> = 9)	1,711	190	10	1.1	2	0.2	8	0.9	
Superior	(n = 4)	720	180	12	3.0	6	1.5	6	1.5	
Chinese $(N=19)$										
Intermediate	(n = 4)	699	175	5	1.3	0	0	5	1.3	
Advanced	(<i>n</i> = 10)	1,823	182	18	1.8	3	0.3	15	1.5	
Superior	(<i>n</i> = 5)	993	199	23	4.6	11	2.2	12	2.4	
Korean ($N = 16$)										
Intermediate	(<i>n</i> = 3)	587	196	3	1.0	0	0	3	1.0	
Advanced	(<i>n</i> = 8)	1,533	192	26	3.3	4	0.5	22	2.8	
Superior	(<i>n</i> = 5)	1,000	200	24	4.8	5	1.0	19	3.8	
L2 Total ($N = 51$))	9,606	188	124	2.4	31	0.6	93	1.8	

Table 3. Numbers of SVVCs and LVVCs within 1,500 Morphemes

As Table 3 shows, LVVCs started to appear among learners in Intermediate groups whereas the production of SVVCs appeared only among members of Advanced groups, regardless of the learners' L1. In addition, LVVCs consistently outnumbered SVVCs in all groups but English Superior. These results seem to indicate that LVVCs are easier to produce/acquire than SVVCs. However, given that native speakers of Japanese also produced predominantly LVVCs (0.6 SVVCs vs. 3.3 LVVCs per person), the earlier appearance and more frequent use of LVVCs might stem from different amounts of input containing LVVCs and SVVCs. We will return to this issue in §4.

Though the relative order of production/acquisition and relative frequencies between SVVCs and LVVCs were invariable, the growth rates differed depending on learners' L1. To clarify how the production of VVCs changed along the course of L2 development, we summarize the shifts in numbers of SVVCs and LVVCs per person in Figures 1 and 2.



Figure 1. Numbers of SVVCs per person

Figure 2. Numbers of LVVCs per person

As Figure 1 shows, Chinese speakers showed a rapid increase in production of SVVCs between Advanced and Superior groups. In contrast, the growth rate among Korean speakers was moderate and constant throughout L2 development. The growth rate of English speakers' SVVCs was in-between. As Figure 2 illustrates, different development patterns emerged with LVVCs. The numbers of LVVCs among Korean speakers steadily rose at a higher rate. The numbers of LVVCs among Chinese speakers also showed an upward trend, but no rapid increase was observed. English speakers' use of LVVCs, by contrast, did not show any notable development, fluctuating between 0.9 and 1.5. These different developmental patterns are likely to be attributed to properties of the learners' L1.

Finally, we analyzed errors contained in VVCs to see what kind of difficulties L2 learners have when producing VVCs and if the difficulties differ across language groups. We examined three types of errors: (i) VVCs with inappropriate forms such as inappropriate declension (*Form Error*); (ii) grammatically correct but contextually inappropriate VVCs (*Selection Error*: e.g., a simplex V or another VVC is preferred); (iii) errors best explained by performance factors (*Performance Error*: e.g., mispronunciation).¹⁹ Table 4 shows the results. Though (ii) and (iii) are different types of errors, it is difficult to differentiate them in the corpus data as the examples in (20) show. Thus the two types are combined in Table 4. In addition, we collapsed SVVCs and LVVCs because the number of errors was quite small and no clear differences in error patterns were found between them.

¹⁹ It is logically possible that a VVC could contain more than one error because these errors are not mutually exclusive. However, we did not find any VVC with multiple errors.

Learners' L1 &		Number (Rate)		En	or Type
Level of Japanese	VVC	ofE	rrors	Form	Selection/Performance
English ($N = 16$)					
Intermediate $(n=3)$	3	2	(66%)	0	2
Advanced $(n=9)$	10	1	(10%)	0	1
Superior $(n=4)$	12	4	(33%)	0	4
Chinese $(N=19)$					
Intermediate $(n = 4)$	5	0	(0%)	0	0
Advanced $(n=10)$	18	2	(11%)	0	2
Superior $(n=5)$	23	1	(4%)	0	1
Korean ($N = 16$)					
Intermediate $(n = 3)$	3	1	(33%)	0	1
Advanced $(n=8)$	26	2	(8%)	0	2
Superior $(n=5)$	24	1	(4%)	0	1
Total ($N = 51$)	124	14	(11%)	0	14

Table 4. Numbers of Errors

Overall, L2 learners did not produce many errors, with only 11% of VVCs containing errors. Interestingly, no Form Error was observed. (20) and (21) are representative Selection/Performance Errors.

a. Korean, Intermediate-Mid, 05, 2059 ²⁰ [appropriate = some- 'dye']									
a,	siraga,	iro-o	kuroi-iro	o-ni	suru-no-o				
well	gray hair	color-ACC	black-co	olor-DAT	do-NOMI-ACC				
nant	o-iimasu-ka	some-ta	isi- masu .	••					
what	t-say-Q	dye-add							
b. Engl	lish, Superio	or, 01, 530	[appropriate = tori-kom- 'take-in']						
	yôroppa-ka	ira-no bunk	a-o	tori-kum-de					
	Europe-fro	m-GEN cultu	re-ACC	tackle-b	у				
a. Chin	ese, Advan	ced-High, 07,	1222	22 [correct pron. = toke-kome-]					
	sono syû	dan-no-naka-r	ni ton	ne-kome-	nai-to				
	that gro	up-GEN-inside	-in inte	integrate-NEG-if					
	a. Kore a, well nant wha b. Engl a. Chin	 a. Korean, Intermeta, siraga, well gray hair nanto-iimasu-ka what-say-Q b. English, Superior yôroppa-ka Europe-froma. Chinese, Advana sono syû that grou 	 a. Korean, Intermediate-Mid, 05, a, siraga, iro-o well gray hair color-ACC nanto-iimasu-ka some-ta what-say-Q dye-add b. English, Superior, 01, 530 yôroppa-kara-no bunk Europe-from-GEN cultur a. Chinese, Advanced-High, 07, sono syûdan-no-naka-re that group-GEN-inside 	 a. Korean, Intermediate-Mid, 05, 2059²⁰ a, siraga, iro-o kuroi-iro well gray hair color-ACC black-con nanto-iimasu-ka some-tasi-masu what-say-Q dye-add-POL b. English, Superior, 01, 530 yôroppa-kara-no bunka-o Europe-from-GEN culture-ACC a. Chinese, Advanced-High, 07, 1222 sono syûdan-no-naka-ni ton that group-GEN-inside-in intervented for the set of the	 a. Korean, Intermediate-Mid, 05, 2059²⁰ [appropriation] a, siraga, iro-o kuroi-iro-ni well gray hair color-ACC black-color-DAT nanto-iimasu-ka some-tasi-masu what-say-Q dye-add-POL b. English, Superior, 01, 530 [appropriation] yôroppa-kara-no bunka-o tori-kur Europe-from-GEN culture-ACC tackle-by a. Chinese, Advanced-High, 07, 1222 [correct sono syûdan-no-naka-ni tome-kome- that group-GEN-inside-in integrate-NEC 				

²⁰ This represents (i) L1, (ii) Proficiency Level, (iii) Participant Number, and (iv) Line Number in the corpus.

b. Chi	nese, Superior	r, 01, 1974	[correct pron. = tuki-atte-]					
	madamada	yûkôtekini	tui-atte-iku-to	tigaun-desu-ka				
	still	friendly	get along with-from	differ-be-Q				

The errors in (20) could be Selection Errors, as they were uttered in the wrong context. They can also, however, be analyzed as Performance Errors; mispronunciation might have led the learners to produce grammatical but contextually inappropriate verbs, for example. The data here do not allow us to identify the error types with certainty. On the other hand, it seems reasonable to analyze the examples in (21) as Performance Errors.

The numbers/rates of errors seem to depend on the learners' L1. In fact, just half of the errors (7/14) was observed among English speakers. In addition, errors persisted somewhat among English speakers. In contrast to Chinese and Korean speakers whose error rates consistently decreased after starting to use a substantial amount of VVCs and reached 4% among Superior groups, English Superior still produced errors at 33%.

In sum, what we can say here are notably: (i) the numbers of errors were very small; (ii) we did not find Form Errors, such as VVCs with inappropriate conjugation; (iii) English speakers, among our three groups, produced the most errors. Although we should note that the numbers of VVCs themselves were small and thus further research is still required, the error patterns, in addition to development rates, seem to indicate cross-linguistic influences.

4. Discussion and Concluding Remarks

In this study, we examined the use of two types of Japanese VVCs by L2 learners from different language backgrounds. The main findings of the present study are as follows:

- (22) a. Both SVVCs and LVVCs were found in L2 learners' speech and their numbers rose as learner proficiency in Japanese increased.
 - b. LVVCs appeared earlier and were produced more than SVVCs.
 - c. The growth rates of SVVCs and LVVCs differed depending on learners' L1: English speakers produced fewer VVCs; Chinese speakers' use of SVVCs and LVVCs grew steadily; Korean speakers' LVVCs increased markedly but such a rapid increase was not observed for SVVCs.
 - Errors were rarely produced; the few errors that occurred were chiefly limited to contextually inappropriate ones or mispronounced ones. No Form Error was observed.

e. Among the errors identified, English speakers produced most of them. Fewer errors were found among Korean and Chinese speakers.

Findings (22a) and (22b) were observed independently from learners' L1, probably indicating that LVVCs are easier for L2 learners to produce/acquire than SVVCs. There are several possible accounts. One explanation would be that LVVCs are produced earlier and more often because L2 learners can use LVVCs just by storing them in memory without further syntactic manipulation. This explanation sounds plausible and it is indeed proposed for the acquisition of VVCs by bilingual children (Terada, 2001). However, in order to examine this hypothesis, we have to investigate whether L2 learners distinguish LVVCs and SVVCs, memorizing the former but constructing the latter at Syntax. This in turn requires data on L2 learners' knowledge on the (in)applicability of syntactic operations to subparts of VVCs or other related restrictions distinguishing LVVCs and SVVCs (e.g., a restriction imposed on argument structure: see fn.4), both of which are rarely observed in spontaneous speech, unfortunately. Another explanation for (22a) and (22b) might be disproportionate amounts of input between LVVCs and SVVCs. Given that native speakers of Japanese also produced predominantly LVVCs (see Table 3), it is likely that L2 learners are exposed more frequently to LVVCs, and accordingly, their use of VVCs is biased toward LVVCs. In addition, it still remains possible that (22a) and (22b) were simply attributable to different numbers of obligatory contexts for SVVCs and LVVCs. Unfortunately, no firm conclusion can be drawn from the present study because independent evidence for/against these possibilities is unavailable. What are surely needed are controlled experiments that uncover the L2 learners' representations for SVVCs and LVVCs. We leave this issue open for future research.

Though LVVCs were produced earlier and more frequently than SVVCs regardless of the learners' L1, this does not mean that the learners' L1 does not play a role. Indeed, (22c) and (22e) suggest possible cross-linguistic influences. Findings (22c) and (22e) would amount to say that (i) English speakers have more difficulty in producing/acquiring VVCs than Korean and Chinese speakers, (ii) it is easy for Korean speakers to produce/acquire LVVCs but less easy to do so with SVVCs, and (iii) Chinese speakers do not have particular difficulty in acquiring/producing SVVCs and LVVCs. These results are expected and straightforwardly explained in terms of the availability of two types of VVCs in learners' L1. As seen in §2, English, Korean, and Chinese differ as to the availability of SVVCs and LVVCs: English does not have

VVCs; Korean allows only LVVCs; Chinese allows both SVVCs and LVVCs, though the majority of Chinese VVCs are syntactic ones. These cross-linguistic facts seem consistent with the present results. Hence, it is plausible to think that the presence or absence of SVVCs and LVVCs in learners' L1 inhibits/facilitates the production/acquisition of SVVCs and LVVCs in L2. However, we again require further research focusing on the role of learners' L1 to draw a firm conclusion.

Finally, we should note that L2 learners rarely produced errors (i.e., (22d)), contrary to the widely accepted view that Japanese VVCs are hard to acquire (e.g., Matsuda, 2002; Morita, 1978). One may think that fewer errors were attributable to so-called *Avoidance* (Schachter, 1974). Avoidance alone, however, cannot explain why errors seem constrained in terms of types and learners' L1 (i.e., (22e)). The relation between errors and learners' L1 will be another topic worthy of pursuit in future research.

To summarize, we examined how L2 learners with different L1s use two types of Japanese VVCs. We found that (i) their use increased along the course of development, but (ii) the growth rates of SVVCs and LVVCs and the numbers/rates of errors differed depending on L1 background. These results suggest that learners' L1 affects how the use of VVCs in L2 Japanese develops. However, as we have admitted, since the data we analyzed here are limited, we have to await further research that focuses on (i) the role of learners' L1, and (ii) learners' knowledge concerning the two types of VVCs.

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English Intermediate (n = 3)Chinese Intermediate (n = 4)Korean Intermediate (n = 3)SVVC (n=0)LVVC (n=3)SVVC (n=0)SVVC (n=0)LVVC (n=5)LVVC (n=3)_____ -------omoi-das-1 -------de-kaker-2 --oti-tuk-1 de-kake-1 tati-agar-_____ ------------1 _____ --some-tas-1 hik-kosdeki-agartuki-a-1 1 1 -----------môsi-age-1 ------

Appendix A: Types of VVCs within 1,500 Morphemes (Intermediate Groups)

Appendix B: Types of VVCs within 1,500 Morphemes (Advanced Groups)

English Advanced $(n = 9)$				Chinese Advanced $(n = 10)$				Korean Advanced $(n = 8)$				
SVVC $(n=2)$ L		LVVC ($n =$	LVVC $(n=8)$		SVVC $(n=3)$		LVVC (<i>n</i> = 15)		SVVC $(n=4)$		LVVC $(n=22)$	
ire-sugi-	1	ii-kikas-	1	kangae-sugi-	1	tuki-a-	3	kangae-naos-	2	uke-ire-	4	
hure-a-	1	ii-das-	1	nari-sugi-	1	uke-ire-	2	kangae-das-	1	tori-kum-	3	
		ukabi-agar-	1	hasiri-tuzuke-	1	kuri-kaes-	2	hanasi-a-	1	omoi-kir-	2	
		ki-gae-	1			si-hara-	1			oi-kos-	1	
		kuri-kaes-	1			toke-kom-	1			osore-ir-	1	
		tati-agar-	1			tori-age-	1			oti-kom-	1	
		tori-kae-	1			tori-atuka-	1			oti-tuk-	1	
		mi-tuke-	1			tori-ire-	1			omoi-das-	1	
						hiki-age-	1			kiki-tor-	1	
						hori-sage-	1			tataki-kom-	1	
						mi-tuke-	1			tuki-a-	1	
										de-kake-	1	
										toke-kom-	1	
										nori-kae-	1	
										mi-kake-	1	
		<u></u>								mi-mamor-	1	

English Superior $(n = 4)$				Chinese Superior $(n = 5)$				Korean Superior $(n = 5)$			
SVVC $(n=6)$ LVVC $(n=6)$		= 6)	SVVC (<i>n</i> = 11)		LVVC ($n =$	LVVC (<i>n</i> = 12)		SVVC $(n=5)$		LVVC (<i>n</i> = 19)	
kake-naos-	2	ire-kae-	2	mukai-a-	2	tuki-a-	3	ari-u-	1	tuki-a-	3
dasi-a-	2	tobi-mawar-	1	ari-u-	1	uke-tome-	1	erabi-sugi-	1	oi-tume-	2
ari-sugi-	1	tori-kum-	1	ii-kir-	1	uri-sabak-	1	si-hazime-	1	ii-das-	1
yari-das-	1	huri-kae-	1	iki-das-	1	si-hara-	1	huri-das-	1	oti-ir-	1
		mori-tate-	1	sui-sugi-	1	de-muk-	1	yari-das-	1	oppori-das-	1
				tori-tuzuke-	1	tori-ire-	1			tati-agar-	1
				nare-sugi-	1	hanasi-kake-	1			tôri-kos-	1
				hanasi-a-	1	mi-mamor-	1			tori-age-	1
				maneki-kane-	1	moti-kom-	1			nige-das-	1
				yari-hazime-	1	yop-para-	1			hiki-age-	1
										hik-kos-	1
										hip-pari-das-	1
										hip-par-	1
										huri-kakar-	1
										muki-das-	1
										mori-agar-	1

Appendix C: Types of VVCs within 1,500 Morphemes (Superior Groups)

^{*} Lists of actual forms L2 learners produced (i.e., tokens) are available upon request.

英語,中国語,韓国語母語話者による 日本語の動詞-動詞複合語の産出

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日本語の動詞-動詞複合語(以下,複合動詞)は形成部門の違いにより統語的 複合動詞と語彙的複合動詞に大別される(影山,1993他).本稿では日本語を 第二言語とする学習者の発話を収録した KY コーパス(鎌田・山内,1999)を 基に,英語母語話者,中国語母語話者,韓国語母語話者による二種類の日本語 複合動詞の使用の変化及び学習者の母語の影響を調査した.調査結果から,(i) 母語の違いによらず語彙的複合動詞の使用開始は統語的複合動詞に先行し,(ii) どの習熟度グループでも語彙的複合動詞の産出数は統語的複合動詞の産出数以 上であったが,(iii)二種類の複合動詞の使用の発達過程は学習者の母語に応 じて異なることが分かった.加えて,(iv)わずかに観察された誤りの分布に も,学習者の母語に応じた偏りが見られた.これらの結果は,日本語複合動詞 使用・習得が学習者の母語における統語的複合動詞,語彙的複合動詞の有無に 影響を受けることを示唆しており,今後,この仮説を検証するために学習者の 母語の性質に着目した実験が必要と論じる.

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