

The Effects of the Placement of Contrastive Focus on the Acceptability and Interpretation of VPE-constructions in Japanese: a pilot experiment^{1, 2}

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Abstract

This paper reports an experiment conducted to examine the effects of the placement of contrastive focus on the acceptability and interpretation of VP-elided sentences in Japanese. In order to indicate the location of contrastive focus clearly to the subjects, the experimental sentences were recorded and incorporated into a computer program to be played back automatically. A significant effect of the presence of a required contrastive focus was found in one of the test items, indicating that Japanese VP-ellipsis is sensitive to the location of contrastive focus in the same way English is. This result provides an additional support for the claim that Japanese has the operation of VP-ellipsis as English does, governed by the same recoverability conditions.

Keywords : VP-ellipsis, recoverability condition, contrastive focus, Japanese, free verbs

1. Introduction

Verb phrase (VP) ellipsis or VP deletion (henceforth VPE) refers to a phenomenon in which a constituent containing the head verb and the base position of all its arguments and modifiers is targeted for phonological deletion despite being interpreted just as its fully pronounced counterpart.³ Some English examples are given in (1).⁴

- (1) a. I will help you with the work if you want me to [~~help you with the work~~]_{VP}.
 b. “Do you think Sam will complete the assignment successfully?”
 (i) “Yes, I do [~~think Sam will complete the assignment successfully~~]_{VP}.”
 (ii) “No. But I think *Mary* will [~~complete the assignment successfully~~]_{VP}.”

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VPE in English has been studied since the earliest days of generative grammar as an effective probe into the nature of different components of the grammar and their interactions.^{5,6} In contrast, there has been little research on Japanese VPE until recently, due to the fact that its presence was not generally recognized. In this paper, I report the results of an experiment conducted as a part of a project to show that Japanese allows the same operation of VPE as English does.⁷ The main focus of the experiment is the effects of the placement of contrastive focus (C-focus) on the acceptability and interpretation of VPE constructions. Since C-focus is primarily signaled by a phonological prominence, the experimental sentences were presented as auditory stimuli. If it can be shown that Japanese is sensitive to the placement of C-focus in the way predicted by the conditions on VPE in English, we will have gained new evidence that Japanese has the same type of ellipsis.

The organization of the paper is as follows: section 2 explains the background of the reported experiment, the Japanese state of affairs that need to be taken into account when selecting the type of predicate verbs (§ 2.1), the theoretical assumptions I adopt (§ 2.2), and the reasons behind the choices of constructions used in the experiment (§ 2.3). Section 3 describes the design of the experiment, and section 4 reports and discusses the results.

2. Background

2.1 The Japanese state of affairs

2.1.1 The need to exclude the “non-elided, null-object-containing VP” structural analysis

As I claimed in Takahashi (2000), Japanese has two morpho-phonologically distinct classes of verbs, bound verbs (BVs) and free verbs (FVs). Simple native-Japanese verbs (*e.g.* *atume* “collect”, *kuyam* “regret”) are BVs, which cannot form a prosodic word (PW) on their own and require an overt PW-mate. When the morpheme immediately following a BV is itself a bound morpheme, no deletion operation can apply to the BV in exclusion of the following morpheme. Tense-markers (TMs) in Japanese are bound morphemes. In a simple BV-sentence in which the BV is immediately followed by a TM (*e.g.* (2)), therefore, the simplest conceivable output of an application of VPE, that is, the deletion of all the VP-materials leaving the TM behind, turns out to be ill-formed (*e.g.* (2b)). This sentence cannot be saved by supporting the stranded TM with the dummy verb *su/si/s-* (henceforth simply *su*), the counterpart of the dummy *do* in English (*e.g.* (2c)). Japanese does allow simple BV-sentences with the obligatory arguments of the verb unpronounced (*e.g.* (2d)). Since Japanese allows null objects (NOs), however, such a sentence is potentially ambiguous between a “VP-elided BV-sentence” structural analysis in which the head verb remains pronounced despite the application of VPE and a “non-elided VP containing a NO” analysis. VPs headed by a BV, therefore, do not provide the best materials for examining VPE in Japanese.

(2) a. simple BV-sentence:

Ken-wa zibun-no misu-o hukaku [kuyan-da]_{PW}.
 Ken-TOP self-GEN mistake-ACC deeply regret-PAST
 “Ken regretted his mistake deeply.”

b. attempted deletion of all the “VP-materials” in a simple BV-sentence:

Taroo-wa zibun-no misu-o hukaku kuyan-da si
 Taro-TOP self-GEN mistake-ACC deeply regret-PAST and
 “Taro regretted his mistake deeply and ...”

*Ken-mo [[~~zibun-no~~ ~~misu-o~~ ~~hukaku~~ ~~kuyan~~]_{VP} ta]_{TP}.
 Ken-also self-GEN mistake-ACC deeply regret PAST
 “Ken -ed, too.”

c. attempted *su* -support of the stranded TM in a VP-elided simple BV-sentence:

*Ken-mo [[~~zibun-no~~ ~~misu-o~~ ~~hukaku~~ ~~kuyan~~]_{VP} si-ta]_{TP}.
 Ken-also self-GEN mistake-ACC deeply regret do-PAST
 “... Ken did, too.”

d. simple BV-sentence with a NO / simple VP-elided BV-sentence(?)

Taroo-wa zibun-no misu-o hukaku kuyan-da si Ken-mo
 Taro-TOP self-GEN mistake-ACC deeply regret-PAST and Ken-also

pro kuyan-da / [[~~zibun-no~~ ~~misu-o~~ ~~hukaku~~ kuyan]_{VP}.da]_{TP}
 regret-PAST / self-GEN mistake-ACC deeply regret-PAST

“ ... Ken regretted it, too. / ... Ken did, too.”

Fortunately, Japanese has FVs alongside BVs (*e.g.* *TYOOSA* “investigate”, *TOOTYAKU* “arrive”, *HOODOO* “report”).⁸ As the first clause in (3) shows, a FV can form a PW and cannot be the PW-mate of a bound morpheme that follows it. Since the TM in (3) cannot be pronounced alone, the dummy verb *su* “do” is inserted in the phonological component to support it. And as the second clause shows, “elided VPs” and “non-elided NO-containing VPs” are clearly distinguishable on the surface when the VP is headed by a FV. In the former, the FV gets deleted leaving the *su*-supported TM behind, while in the latter, the FV remains overt.

- (3) Taroo-wa zibun-no misu-o hukaku [KOUKAI]_{PW} [si-ta]_{PW} si
 Taro-TOP self-GEN mistake-ACC deeply regret do-PAST and
 “Taro regretted his mistake deeply and ...”

a. simple VP-elided FV-sentence:

Ken-mo [~~zibun-no~~ ~~misu-o~~ ~~hukaku~~ ~~KOUKAI~~]_{VP} si.ta
 Ken-also [self-GEN mistake-ACC deeply regret]_{VP} do-PAST
 “... Ken did, too.”

b. simple FV-sentence with a NO:

Ken-mo	pro	KOOKAI	si-ta
Ken-also		regret	do-PAST

“... Ken regretted it, too.”

In order to exclude the unwanted “non-elided NO-containing VP” interpretation, therefore, I used FV-headed VPs in all but the last test item.

2.2 The need to exclude the “light-*su* VP” and “pro-VP” interpretation

Using FVs instead of BVs does not solve all the problems. In Japanese, a morpheme that looks exactly like the dummy verb *su* can also be used as a light verb.⁹

(4) light-*su* construction with an Accusative-marked modifier:¹⁰

- a. Taro-wa [sintyoona deeta-no BUNSEKI [Ø]_N-o si-ta
 Taro-TOP [careful data-GEN analyze [Ø]_N]-ACC do-PAST
 “Taro did a careful analysis of the data.”
- b. Hanako-wa [sono riron-no migotona SETUMEI [Ø]_N-o si-ta
 Hanako-TOP [the theory-GEN excellent explain [Ø]_N]-ACC do-PAST
 “Hanako gave an excellent explanation of the theory.”

When a FV can be used in this construction, a simple FV-sentence followed by a clause with a *su*-TM sequence and no other “VP-materials” is potentially ambiguous between the two structural analyses given in (5a) and (5b).¹¹

- (5) Taro-wa sintyooni deeta-o BUNSEKI si-ta si
 Taro-TOP carefully data-ACC analyze do-PAST and
 “Taro analyzed the data carefully and ...”

a. VP-elided light-*su* VP (pronounced *su* = dummy):

Ken-mo	[sintyooni]	deeta-o	BUNSEKI] _{VP}	si-ta
Ken-TOP	[carefully	data-ACC	analyze] _{VP}	do-PAST

“... Ken did, too.”

b. light-*su* VP with a null Accusative-marked modifier (pronounced *su* = light V):

Ken-mo	[sintyoona]	deeta-no]	BUNSEKI]	[Ø]_N]-o	si-ta
Ken-also	[careful	data-GEN	analyze	[Ø] _N]-ACC	do-PAST

“... Ken did it, too.”

In fact, such a sentence is potentially three-ways ambiguous because the second clause may also receive the following analysis:

- (5) c. light-su clause with a null pro-adverb (pronounced *su* = light V):¹²

Ken-mo	[s oo] _{ADV}	si-ta
Ken-also	[so] _{ADV}	do-PAST

“Ken did so, too.”

In order to exclude these unwanted structural analyses (*i.e.* (5b) and (5c)), I used a non-Agentive FV-headed VP in all the relevant positions. The examples given in (6) show that the light-*su* construction and *soo su* “do so” in Japanese can only be used with an Agentive verb.

- (6) a. light-su clause with a modifier containing a VP headed by a non-Agentive V:

*Taroo-wa	[Hanako-e-no	hukai	SONKEI	[Ø] _N]-o	si-ta
Taro-TOP	[Hanako-to-GEN	deep	admire	[Ø] _N]-ACC	do-PAST

“Taro had a deep admiration for Hanako.”

- b. light-su clause with a pro-adverb:

Taroo-wa	Hanako-o	hukaku	SONKEI	si-ta	si
Taro-TOP	Hanako-ACC	deeply	admire	do-PAST	and

*Ken-mo	[soo] _{ADV}	si-ta
Ken-also	[so] _{ADV}	do-PAST

“*Taro admired Hanako deeply and Ken did so, too.”

2.2 Theoretical assumptions

There are two major issues on VPE, one concerning the syntactic representation of the constituent containing the elided site and the mechanism under which the VP materials are rendered phonologically null, and one concerning the required match between the constituent containing the elided site and its “antecedent”, which I will call the “recoverability conditions” here.

On the former issue, I assume, with Tancredi (1992), Rooth (1992a), Tomioka (1997), Heim (1997), and many others, that VPE is an extreme form of phonological reduction signaling the presence of a discourse anaphor. It is brought about by the phonological deletion of a VP which contains all the lexical materials to be interpreted, derived in the same way as non-deleted VPs.

- (7) Deaccenting or deletion can occur only inside a discourse anaphor.

On the latter issue, I adopt what I consider to be the main ingredients of Heim’s (1997) analysis as I did in Takahashi (2015), repeated in (8) ~ (10) with some modifications.¹³

(8) a. Proper Antecedent Condition (PAC):

A discourse anaphor α must have an antecedent β that satisfies the following condition:
For all assignments g , the (regular) semantic value of β w.r.t. g
is an element of the focus value of α w.r.t. g in the sense of Rooth (1985, 1992a).

b. necessary conditions for PAC:

- i α and β have LF representations parallel in structure
- ii the LF representation of α and β do not overlap
- iii In order for focus alternatives to be evoked for α , α must contain the head of the C-focused chain where the phonological prominence is realized.

c. Complete-argument-complex Condition (CAC):

The smallest constituent that PAC can evaluate is one that contains the base position of the verb and all its arguments, including the “external argument”.

(9) Elided VP Condition (eVPC):

A deleted constituent can only be interpreted to be made up of the same lexical material as the corresponding constituent in the antecedent.
(Provision: The indices on variables in the corresponding positions in the two constituents may be different.)

(10) a. Two expressions α and β are logically equivalent iff

$\llbracket \alpha \rrbracket^g = \llbracket \beta \rrbracket^g$ for every variable assignment g .

b. No Meaningless Coindexing (NMC)¹⁴:

If an LF contains an occurrence of a variable v that is bound by a node α ,
then all occurrences of v in this LF must be bound by the same node α .

The central condition in Heim’s (1997) analysis is the Proper Antecedent Condition (PAC) given in (8a). It incorporates Rooth’s (1985, 1992a) theory of contrastive focus (C-focus), which holds that the semantic effect of C-focus is giving rise to a set of alternatives to the denotation of the C-focused constituent.¹⁵ In other words, PAC requires the logical representation of a discourse anaphor (signaled by containing a phonologically reduced or deleted constituent) to be equivalent to that of its antecedent’s except for the contribution of the part marked by C-focus.

2.3 The constructions used in the experiment

There were three pairs of major test items in the experiment, A(+n) & A(-n), B(+n) & B(-n), and D(+n) & D(-n). In addition, there were two control items, C1 and C2. The “(+n)” sub-label indicates that the item was read naturally, with a C-focus in the required location for a VPE to be licensed. The “(-n)” sub-label indicates that the item was read unnaturally, without the required C-focus. I will explain the reasons for including each pair of items in turn.

2.3.1 A-items and C1

A(+n) and A(-n) were the central items in the experiment to see the effects of the placement of C-focus on the acceptability of VPE in Japanese. A(+n) sentences were read with a phonological prominence on the embedded subject of the second clause to indicate the presence of a C-focus on the constituent. A(-n) sentences were read without a phonological prominence in that position so as to indicate the absence of a C-focus there.

- (11)¹⁶a. A(+n): conjoined complex sentences with an embedded VPE, verb=nonAgentiveFV, stress pattern=natural

Biru-wa	Hirarii-ga	daitooryoo-ni	TOOSEN	su-ru	to	omot-tei-ta
Bill-TOP	Hillary-NOM	president-DAT	win	do-PRES	COMP	think-PROG-PAST
ga	Zyoozi-wa	<i>Zyebu-ga</i>	su-ru	to		omot-tei-ta
but	George-TOP	Jeb-NOM	do-PRES	COMP		think-PROG-PAST

“Bill thought Hillary would win the presidential election but George thought *Jeb* would.”

- b. A(-n): conjoined complex sentences with an embedded VPE, verb=nonAgentiveFV, stress pattern=unnatural

titioya-wa	tyoozyo-ga	saisyoo-ni	KEKKON	su-ru	to
father-TOP	eldest-daughter-NOM	first-at	marry	do-PRES	COMP
omot-tei-ta	ga	hahaoya-wa	zizyo-ga	<i>su-ru</i>	to
think-PROG-PAST	but	mother-TOP	second-daughter-NOM	do-PRES	COMP
omot-tei-ta					
think-PROG-PAST					

“The father thought the eldest daughter would marry first but the mother thought that the second daughter would.”

The construction used is one that corresponds to the English example given in (12).

- (12) a. Bill thought Hillary would win the election but George thought *Jeb* would.

- b. Bill thought [Hillary_i would [_{t_i} win the election]_{VP}]_β
but George thought [[*Jeb*_j]_F would [_{t_j} win the election]_{VP}]_α

In (12a), as in (11), two complex clauses are coordinated, and the embedded clause of the first conjunct serves as the antecedent β of the embedded clause in the second conjunct α containing the elided VP. The LF and the phonological representation are shown in a simplified form in (12b).¹⁷ The semantic value of β qualifies as an element of the focus alternatives of α because they are identical in

structure and the only element that is different in α is the C-focused “Jeb”. Thus, Heim’s PAC is satisfied as all other conditions. Note that PAC would failed to be satisfied if “Jeb” were not C-focused; the semantic value of β would not be an element of the focus alternatives of α in that case. In (12), then, the presence of a C-focus sanctions an otherwise impossible VPE.

If Japanese obeys the same recoverability conditions for VPE that English does, VPE is expected to be allowed in A(+n) items but not in A(-n) items for the same reasons. The reason for using complex clauses for the conjuncts was to let the required C-focus fall on a constituent other than a topic-marked phrase. In Japanese, a sentential topic is normally marked with *wa*, whose influence on the focus structure of the sentence is hard to eliminate completely even if unstressed.

In addition, there was a control item, C1.

- (13) C1: conjoined complex sentences with a matrix VPE, verb=nonAgentiveFV,
stress pattern= natural

Biru-wa	Hirarii-ga	TOOSEN	su-ru	to	KAKUSIN	si-tei-ta
Bill-TOP	Hillary-NOM	win	do-PRES	COMP	believe-strongly	do-PROG-PAST
si	<i>Tyerusii-mo</i>	si-tei-ta				
and	Chelsea-also	do-PROG-PAST				

“Bill thought Hillary would win and Chelsea did, too.”

This item was included to check if the adoption of the complex structure would be a source of difficulty in comprehending the sentences. C1 sentences had a structure comparable to the ones used for the A-items except that VPE targeted the matrix VP rather than the embedded VP. Thus, there were more structure and materials to recover from the antecedent. If this item is interpreted successfully, therefore, it can be assumed that the structure of A-sentences does not present more problems.

2.3.2 An outstanding puzzle, B-items, and C2

The next pair of items, B(+n) and B(-n), and a control item, C2, were included to reexamine an outstanding puzzle from a previous experiment.

What Kennedy (2008) calls “argument-contained ellipsis” (ACE) is one of the most extensively discussed class of VPE constructions in English, and Kennedy’s generalization (K’sG) on ACE, quoted in (14), was a chief motivation behind Heim’s (1997) formulation of the recoverability conditions on VPE. Two examples are given in (15) and (16).

(14) Kennedy's (2008) generalization on argument contained ellipsis (ACE) (K'sG):

Ellipsis between VP₁ and VP₂, VP₁ contained in an argument A₂ of VP₂, is licensed only if A₂ is identical to the parallel argument A₁ of VP₁.

(15) a. *Every man who wants George to leave *should*.

b. $\forall x \left[\left[\text{man}(x) \ x \text{ wants George}_y \text{ to } \underline{y \text{ leave}} \right] \left[\left[\text{should} \right]_F \ \cancel{x \text{ leave}} \right] \right]_\alpha$ ¹⁸

c. Every man who wants George to leave should leave.

(16) a. Polly visited every town *ERIC* did.

b. $\forall x \left[\left[\text{town}(x) \left[\left[\text{Eric}_y \right]_F \text{ PAST } \cancel{y \text{ visit } x} \right] \right]_\alpha \left[\left[\text{Polly}_z \text{ PAST } \underline{z \text{ visit } x} \right] \right]_\beta \right]$

(15a) is an example of a case where the antecedent VP (VP₁) of the deleted VP (VP₂) is contained in the subject of VP₂. K'sG is not satisfied because the subjects of the two VPs are different, "George" for VP₁ and "man" for VP₂. The conditions in (8) ~ (10) work together to exclude (15a) as follows: in its logical representation, (15b), the variables occupying the base position of the subject in the two VPs, which α and β must contain (\cdot :CAC (8c)), are forced to be different (\cdot :NMC (10b)) and the only ways of making the x in α inoffensive to PAC, either by C-focusing a link of an x -chain which is phonologically overt or by binding x so that its value would be assignment independent, would make α contain the quantified phrase (and thus the entire logical representation including β , whatever its size), causing a violation of (8b-i). The well-formedness of (15c), the overt counterpart of (15a), indicates that VPE is responsible for this requirement.

(16a) is an example of the so-called "antecedent-contained deletion", a case where the deleted VP (VP₁) is contained in the object of the antecedent VP (VP₂). K'sG is satisfied in this example because the objects of the two VPs are the same, both "town". The logical representations given in (16b) reflect the application of QR, which moves the quantified phrase out of the matrix VP. This saves the sentence, because if the constituent including the pronounced subject and the VP is chosen to be α and β for the purposes of PAC (cf.(8a)), with *Eric* C-focused, all the conditions in (8) ~ (10) are satisfied. Note that a C-focus on the relative clause subject, *Eric*, is a key factor in satisfying the conditions. Without it, focus alternatives would not be evoked and the semantic value (SV) of β would not be member of the focus alternatives of the SV of α .

Aiming to show that the same recoverability conditions are operative in Japanese, I have tested the constructions given below in a paper-based experiment, the results of which are reported in Takahashi (2015).

(17) K'sG, unmatched subject:

*[Sutiibu-ga SYOOSIN su-ru to omot-tei-ta subete-no syain]-ga
 Steve-NOM advance do-PRES-COMP think-GER-PAST all-GEN employee]-NOM

si-ta
 do-PAST

“Every employee who had thought Steve would be promoted was.”

(18) K'sG, matched object, antecedent contained in the unscrambled object:

*KBS-wa [NHK-ga HOODOO si-ta subete-no ziken]-o si-ta.
 KBS-TOP [NHK-NOM report do-PAST all-GEN incident]-ACC do-PAST
 “KBS did every incident NHK reported.”

(19) K'sG, matched object, antecedent scrambled out of the object:

a. [NHK-ga HOODOO si-ta subete-no ziken]-o *KBS-mo* t_i si-ta.
 [NHK-NOM report do-PAST all-GEN incident]-ACC KBS-also t_i do-PAST
 “Every incident NHK reported, KBS did also.”

b. $\forall x \{ [ziken(x) [NHK_y PAST y HOODOO x]_{\beta}] \{ [KBS_z-mo]_F PAST z HOODOO-x \}_a \}$

Sentence (17) corresponds to (15a) in English and it is expected to be ill-formed for the same reasons no matter how it is stressed.

Finding Japanese counterparts of (16a) involved some complications. If I translate a (16a)-type sentence “blindly” into Japanese, that is, translate its overt counterpart and delete the VP in the relative clause, the result is ill-formed as shown in (20). It sounds as bad as “KBS did every incident that NHK reported” in English.

(20) *KBS-wa [NHK-ga si-ta subete-no ziken]-o HOODOO si-ta.
 KBS-TOP [NHK-NOM do-PAST all-GEN incident]-ACC report do-PAST
 “KBS reported every incident NHK did.”

I assume that this is due to the requirement that the antecedent must precede the elided VP.¹⁹ If I delete the other VP instead of the one contained in the relative clause, the result still sounds bad: (18). The sentence, however, improves for me if the object is scrambled to the left of the subject: (19a). My explanation for this contrast is as follows: if licensed, VPE targets the entire VP, including the usual surface position of the object. Since the head verb is deleted under VPE if it is a FV, the pronunciation of the object and the deletion of the FV are incompatible in a sentence such as (18). In (19a), the object is scrambled out of the VP before the application of VPE. As can be seen in its logical representation (19b), non-overlapping α and β can be found, and the SV of β will be a member

of the focus alternative of the SV of α if the matrix subject *KBS* is stressed.

When asked if these types of sentences were well-formed and interpretable or not, the participants in the experiment responded in the following way:

Table 1: Mean percentage of expected responses

Construction Type	(17)	(18)	(19)
Expected Response	No	No	Yes
Mean (%)	92.12	94.55	50.30
Standard Deviation	14.09	15.23	34.69

The (17)-type and (18)-type constructions were judged ill-formed, as expected. The responses to the (19)-type constructions were not so clear-cut. The acceptance rate for this construction was significantly higher than that for (18)-constructions ($\chi^2=9.635(df=1)$, $p=0.0019<0.01$), which was a difference in the right direction, but it remained at a chance level. This is a difficult construction to process, and the fact that it was presented in a written form may have contributed to the difficulty. In a new experiment reported here, I decided to include the (19)-type constructions and to present them in two different ways, one with the C-focus in the required position (B(+n)) and one without (B(-n)). In addition, (18)-type constructions read naturally were included as a control item (C2).

- (21) a. B(+n): matrix VPE, its antecedent contained in the scrambled object, verb=FV,
location of CF=natural

Taroo-ga KOPII si-ta subete-no bunken-o *Hanako-mo* si-ta
 Taro-NOM copy do-PAST all-GEN document-ACC Hanako-also do-PAST
 “Every document Taro copied, *Hanako* did, too.”

- b. B(-n): matrix VPE, its antecedent contained in the scrambled object, verb=FV,
location of CF=unnatural

Taroo-ga ANKI si-ta subete-no bunsyoo-o Kenta-mo si-ta
 Taro-NOM memorize do-PAST all-GEN passage-ACC Kenta-also do-PAST
 “Every passage Taro memorized, Kenta did, too.”

- (22) C2: matrix VPE, its antecedent contained in the unscrambled object, verb=FV,
location of CF=natural if there were no deletion

**Nihon-wa* Amerika-ga SYUSSEKI si-ta subete-no kaigi-ni si-ta
 Japan-TOP U.S.A-NOM attend do-PAST all-GEN conference-at do-PAST
 “**Japan* did every conference U.S.A. attended.”

2.3.3 D-items

The D-items were included to see if VPs headed by a BV can indeed be the target of VPE in Japanese. As explained in section 2.1.1, a sentence with a lexical string such as in (2d), repeated below as (23), can potentially receive a VPE structural analysis or a “non-elided VP containing a NO” analysis. Given these possibilities, do Japanese speakers actually allow the VPE analysis? It is important to show that all types of Japanese VPs allow VPE, not just a sub-part.

- (23) Taroo-wa zibun-no misu-o hukaku kuyan-da si Ken-mo kuyan-da
 Taro-TOP self-GEN mistake-ACC deeply regret-PAST and Ken-also regret-PAST
 “Taro regretted his mistake deeply and Ken did, too / Ken regretted it, too.”

Although string-ambiguous, only the VPE-interpretation is expected to obey the licensing condition of VPE, which is sensitive to the placement of C-focus. By presenting this construction with different stress patterns, it was hoped that the two interpretations could be teased apart. If the sentence is read with a phonological prominence on the subject of the second clause indicating the presence of a C-focus there, the VPE interpretation is expected to be allowed, if possible. Item D(+n) was a test for this prediction.

- (24) a. D(+n): conjoined simple sentences with the object and an adverb unpronounced,
verb=BV, location of CF=natural for VPE

Hoomuzu-wa	sono	ziken-o	kuwasiku	sirabe-ta	ga
Holmes-TOP	the	incident- ACC	in-detail	investigate-PAST	but
<i>keisatu-wa</i>	sirabe-nakat-ta				
police-TOP	investigate-NEG-PAST				

“Holmes investigated the incident in detail but the police did not.”

- b. So, the police were criticized.
 c. Why were the police criticized?
 i appropriate answer: Because they didn’t investigate the incident in detail.
 ii inappropriate: Because they didn’t investigate the incident.

If a VPE-analysis is chosen for (24a), a more appropriate answer to the question in (24c) (after being given the additional information in (24b)) should be the one in (24d-i), with the described event modified by the same adverb as in the antecedent.

If the sentence was read with a stress pattern indicating an absence of C-focus on this constituent, on the other hand, only the “NO-containing VP” interpretation is expected to be allowed. Item D(-n) was a test for this prediction.

- (25) a. D(-n): conjoined simple sentences with the object and an adverb unpronounced,
verb=BV, location of CF=unnatural for VPE

Taroo-wa deeta-o takusan atume-ta ga Kenta-wa pro *atume -nakat-ta*
 Taro-TOP data- ACC much collect-PAST but Kenta-TOP collect-NEG-PAST

“Taro collected a lot of data but Kenta didn’t collect them.”

- b. So, Kenta couldn’t complete his research.
- c. Why couldn’t Kenta complete his research?
- d. i inappropriate: Because he didn’t collect a lot of data.
- ii appropriate answer: Because he didn’t collect any data.

And if (25a) is interpreted as a NO-construction, a more appropriate answer to the question in (25c) (after being given the additional information in (25b)) should be the one in (25d-i), for there is no requirement for the events described by the two VPs to be the same in this case.

I chose to use Agentive BVs for these test items to allow for more variety in the events described by the sentences. Unlike for the rest of the items, there is no danger for these items to be interpreted as a light-*su* construction or a *soo su* “do so” construction because a *su* does not appear; the verb supporting the TM in the second clause is a fully lexical BV.

3. The design of the experiment

3.1 Experimental method

Since the purpose of the experiment was to see the effects of the placement of C-focus, it was necessary to present the test sentences as auditory stimuli. In order to keep the stimuli constant across multiple sessions of the experiment, audio recordings of the test sentences were made and they were incorporated into a computer program to be played back automatically. The program used was “Zurich toolbox for ready-made economic experiments (z-Tree) version321), developed and made available by the University of Zurich.”^{20,21}

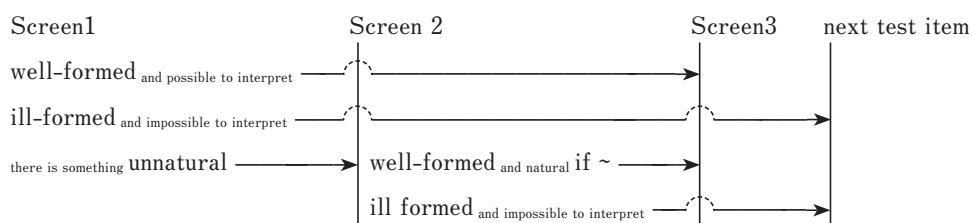
A maximum of three responses were elicited for each test item, on Screen 1 (S1), S2, and S3 in a multiple choice format. As soon as a test item started, S1 was shown and the test sentence was played back, which the subjects listened to through a headphone.²² At the top of the screen was a playback bar, indicating where the playback was at a given moment. After the initial automatic playback, the subjects could click on an icon to repeat the playback for as many times as they wanted. Below the playback bar on the same screen were three options to choose from: ○well-formed and possible to interpret, ○there is something unnatural, ○ill-formed and impossible to interpret. The subjects indicated their judgement on the played-back sentence by clicking on and marking a circle at the beginning of one of the options.²³ There was an OK button on the lower right-hand corner of each

screen, which was a prompt to proceed to the next screen. The subjects could keep changing their answer until they clicked on the OK button. If the option chosen was the first one, the next screen shown was S3. If the third option was chosen, the experiment moved on immediately to the next test item.

If a subject chose the second option on S1, the next screen shown was S2, on which the test sentence was shown in a written form, with three numbered underlines. Below, there were four options to choose from: ○well-formed and natural if 1 is pronounced most strongly²⁴, ○well-formed and natural if 2 is pronounced most strongly, ○well-formed and natural if 3 is pronounced most strongly, ○ill-formed and impossible to interpret regardless of the pattern of pronunciation. In other words, subjects who weren't exactly sure of the status of the test sentence just by listening to it were given a second chance to assess it, this time by looking at a written form of the sentence. If the subject chose one of the first three options, the next screen shown was S3. If the fourth option was chosen, the experiment moved on to the next test item.

On S3 were shown the test sentence written in black, this time without any underlining, a sentence giving additional information in blue, and a question asking the interpretation of the sentence in red. Below these sentences were four answers to choose from, the final one of which was: none of the above. The schema for the procession of the experiment are shown in (27).

(27) Procession of the experiment:



I read the test sentences in my native Kansai dialect. In reading the test sentences, I tried to make the position of the accent in the intended C-focused constituent higher in pitch, louder and longer than in a minimal pair without a C-focus in the same location would be.²⁵ The attempt was checked against the wave pattern of its counterpart in the minimal pair. The recordings were made on a linear PCM recorder (Olympus LS-14), were edited on Audacity and saved in WAV-format files. When played back, the naturalness / unnaturalness of the sentences were clear to my ear.

3.2 The number and arrangement of test sentences

For each of the eight items included in the experiment: A(+n), A(-n), C1, B(+n), B(-n), C2, D(+n),

and D(-n), two sentences each were tested. There were thus sixteen test sentences.

In addition, there were eight fillers, simple “puzzle”-like questions such as the following.

(28) a. 243, 81, 27, 9, 3,

What is the number to be placed in ?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ none of the above

b. 遅 (slow), 速 (fast), 低 (low), 高 (high), 少 (few),

What is the Chinese character to be placed in ?

- ☐ 多 (many)
- ☐ 大 (big)
- ☐ 強 (strong)
- ☐ none of the above

There were two purposes for including these fillers. One was to give a break for the subjects so that they can assess the upcoming sentences with a fresh mind. The other was to check their concentration.

The order of the presentation of the sixteen test items were determined semi-randomly so that neither i) constructions of the same type, nor ii) sentences which were expected to be judged in the same way (either well-formed, unnatural, or ill-formed) appeared consecutively. The fillers were placed after every two test items. In addition, there were two practice items at the beginning of the experiment, one well-formed and naturally read sentence, and another read unnaturally. The subjects were asked to go through the practice items step by step, as the experimenter explained the procedure. Once the main experiment started, the subjects proceeded at their own pace.

4. Results and Discussion

Fifty students attending Kyoto Sangyo University participated in the experiment in four separate sessions. Most of them were speakers of Kansai.²⁶ Because of a computer problem in the first session, five of the subjects could not complete the experiment. There were nine others who made some mistake in responding to the fillers. They were excluded from the analysis of the results. We thus have seventy-two response tokens for each test item from thirty-six subjects.

4.1 A-items and C1

The subjects' responses to A(+n), A(-n) and C1 are shown in Table 2. For whether the sentences were judged well-formed (✓) or ill-formed (*) and whether the subjects “agreed with” the way the sentence was stressed (=) or not (≠), I added the number of applicable responses to the choices on

the first screen (S1) and the second (S2). Making a decision just by listening to the sentence would not have been easy and more cautious subjects may have opted for the indecisive response, “there is something unnatural”, on S1. I interpret their response on S2 to be equally indicative of their judgment on how the sentence should be stressed. Although A(+n) and A(-n) sentences had the same syntactic structure, there were much more S1 judgements that the construction was ill-formed for A(-n) than for A(+n) items (*cf.* the shaded cells in Table 2.) This indicates that the “ill-formed” responses on S1 is a mixture of the syntactic and phonological ill-formedness (for items read unnaturally).

Table 2: Number of response tokens to A(+n), A(-n) and C1

grammaticality	stress pattern	A(+n)		A(-n)		C1	
✓	=	S1: 54	62	S1: 13	19	S1: 54	57
		S2: 8		S2: 6		S2: 3	
	≠	1		30		2	
*	<div></div>	S1: 5	9	S1: 18	23	S1: 3	13
		S2: 4		S2: 5		S2: 10	
Total		72		72		72	
mistakes in interpretation (S3)		3 / 63		1 / 49		0 / 59	

A χ^2 test was carried out on the portions of the data shown in the contingency table below. The result was highly significant ($\chi^2=56.08(df=2)$, $p=6.639 \times 10^{-13}$).

Table 3: Well-formedness and naturalness judgements for A-items

grammaticality	stress pattern	A(+n)	A(-n)	Total
✓	=	62	19	81
	≠	1	30	31
*		9	23	32
Total		72	72	144

This indicates that the subjects as a group responded differently to A(+n) and A(-n), tending to judge A(+n) items well-formed and naturally read while tending to judge A(-n) items unnaturally read. I interpret this to show that the recoverability conditions for VPE in (8) ~ (10) are operative in Japanese just as in English, requiring the embedded subject to be C-focused so that the SV of β can qualify as a member of the focus alternative of the SV of α in (29).

(29) logical representation for an A(+n) item (11a):

Biru-wa [Hirarii-ga daitooryoo-ni TOOSEN]_β su-ru to omot-tei-ta ga
 Bill-TOP Hillary-NOM president-DAT win do-PRES COMP think-PROG-PAST

Zyoozi-wa [[*Zyebu* i-ga]_F [~~t_i-daitooryoo-ni TOOSEN~~]_α su-ru to omot-tei-ta
 George-TOP Jeb-NOM president-DAT win do-PRES COMP think-PROG-PAST

“Bill thought Hillary would win the election but George thought *Jeb* would.”

The complexity of the task may well have contributed to the higher-than-expected “ill-formed” judgement rates for A(+n) items (9/72=13%) and C1 items (13/72=18%). When the sentences were accepted, however, there were very few interpretation mistakes. I take this to indicate that VPE in these sentences were interpreted successfully overall.

4.2 B-items and C2

Going on to cases that fall under K’sG, as Table 4 shows, no effect of the difference in the stress pattern was found between B(+n) and B(-n) ($\chi^2=4.221(df=2)$, $p=0.1212>0.05$).

Table 4: Number of response tokens to B(+n), B(-n) and C2

grammaticality	stress pattern	B(+n)		B(-n)		C2*	
✓	=	S1: 34	38	S1: 29	38	S1: 9	10
		S2: 4		S2: 9		S2: 1	
	≠	2		8		5	
*	<div></div>	S1: 20	32	S1: 13	26	S1: 37	57
		S2: 12		S2: 13		S2: 20	
Total		72		72		72	
mistakes in interpretation		0 / 40		0 / 46		<div></div>	

Upon reconsidering the way I stressed the B(-n) items (with a prominence on the subject of the scrambled out relative clause *Taroo* in (21b), repeated below as (30)), I realize that it fails to indicate the absence of C-focus on a position required by (8), on *Kenta*. The presence of a focus at the beginning of the sentence does not rule out the possibility that there is another, even stronger focus in the latter part of the sentence. In addition, the presence of the focus-marker *mo* “also” on *Kenta* may have signaled the presence of a C-focus there non-phonologically. I need to choose the construction and the stress pattern more carefully in the future.

(30) B(-n):

Taroo-ga ANKI si-ta subete-no bunsyoo-o Kenta-mo si-ta
 Taro-NOM memorize do-PAST all-GEN passage-ACC Kenta-also do-PAST
 “Every passage *Taro* memorized, Kenta did, too.”

Although not improved upon as hoped, the results reported in Takahashi (2015) were replicated in this experiment: the difference in the acceptance-rate for B(+n) and C2 was significant ($\chi^2=18.39$ (df=1), $p=1.804 \times 10^{-5}$), confirming that (8b) is operative in Japanese as well as other requirements in (8) ~ (10).

Table 5: Differences in the grammaticality judgements for B(+n) and C2

grammaticality	B(+n)	C2	Total
✓	40	15	55
*	32	57	89
Total	72	72	144

Also, B-items were interpreted correctly when accepted. As can be seen in Table 4, there were no interpretation mistakes for either B(+n) or B(-n). For example, on S3 for item (31), the subjects chose (31c-ii) in answering the question.

(31) a. B(+n) test sentence:

Taroo-ga KOPII si-ta subete-no bunken-o *Hanako-mo* si-ta
 Taro-NOM copy do-PAST all-GEN document-ACC Hanako-also do-PAST
 “Every document Taro copied, *Hanako* did, too.”

b. Additional information given on S3:

The (relevant) documents were ①, ②, ③, ④, ⑤, ⑥. Taro copied ④, ⑤, ⑥.

c. Question: Which documents did Hanako copy?

- i ①, ②, ③
- ii ④, ⑤, ⑥
- iii ①, ②, ③, ④, ⑤, ⑥
- iv none of the above

4.3 D-items

Finally, the subjects' responses to the D-items are shown in Table 6.

Table 6: Number of response tokens to D(+n) and D(-n)

grammaticality	stress pattern	D(+n)		D(-n)	
✓	=	S1: 65	68	S1: 59	62
		S2: 3		S2: 3	
	≠	2		5	
*	<div></div>	S1: 1	2	S1: 1	5
		S2: 1		S2: 4	
Total		72		72	
Interpretation: VPE / NO / other		37 / 32 / 3		39 / 28 / 5	

Here again, the difference in the location of focus had no significant effect: most of the D(+n) items and D(-n) items were judged well-formed and naturally pronounced. A reexamination of the selection of the construction and the stress pattern is necessary just as for the B-items. Nevertheless, the interpretations given do suggest that these sentences allow the VPE structural analysis. As can be seen in the last row in Table 6, the number of VPE-type responses exceeded that of NO-type responses for both D(+n) and D(-n).

5. Conclusion

In conclusion, of the three pairs of items tested in the experiment, the contrast in the response patterns to the two A-items showed that the proper placement of C-focus affects the acceptability of VPE in Japanese just as expected by the recoverability conditions for English VPE given in (8) ~ (10). This provides a new piece of evidence for the claim that Japanese has the same operation of VPE as English does.

The failure of the other two test items may be attributed to difficulties in unambiguously signaling the location of C-focus in the stimuli sentences. Reexamination of the selection of constructions and the stress pattern is necessary.

The fact that a positive result was obtained in this admittedly crude attempt is promising for future research. With an improvement in the quality of the recordings and the programming of the experiment, further significant results can be hoped to be obtained.

Notes

- 1 The experiment reported here was conducted as a part of the project: 「動詞句・形容詞句省略と代用の生起メカニズムを探る：日・英語比較研究」 supported by 「新規研究課題挑戦支援プログラム」 of Kyoto Sangyo University, grant number E1512.
- 2 I would like to thank the Economics Department of Kyoto Sangyo University for allowing me to use the computer lab, Professor Yoshio Iida for his invaluable support, Dr. Takanori Kudo of Setsunan University for his assistance with the programming of z-Tree, and En Shu, Masahiro Yamaguchi, Yo So, and Ayaka Taguchi for their help with the tabulation and the analysis of the data.
- 3 I remain neutral about the exact identity of this constituent. It is one that contains the VP and the usual surface position of the object, the functional projection in which it receives Case.
- 4 The strikeouts indicate the deleted words. The bold italicized word marks the location of a major phonological prominence, indicating that a constituent containing it bears a contrastive focus.
- 5 See Johnson (2008) and references cited therein.
- 6 For the research history on whether or not VPE exists in Japanese, see Otani and Whitman (1991), Hoji (1998), Takahashi (2000), and Arimoto and Murasugi (2005).
- 7 This project builds on research supported by a Grant-in-aid for Scientific Research from the Japan Society for the Promotion of Science, grant number 22520513. The findings of a previous experiment are reported in Takahashi (2015).
- 8 These are lexical items traditionally called “verbal nouns”. See Takahashi (2000) for an extensive discussion on why they are verbs and not nouns.
- 9 Japanese *su* can be used as a main verb, a light verb, and a dummy verb just as English *do* can be.
 - (i) a. main verb: You must do your homework before you go out to play.
 - b. light verb: You will get a chance to do a proofreading before the paper is published.
 - c. dummy verb: Did you proofread the manuscript before you submitted it?
- 10 See Takahashi (2000) for the claim that the *o*-marked phrase is not an argument but a modifier of the light-*su*.
- 11 The possibility for the second structural analysis is pointed out in Miyagawa (1989) and a response pattern reflecting this type of analysis was detected in a pilot study I have conducted.
- 12 I assume that *soo su* “do so” in Japanese, which is often referred to a “pro-VP” is composed of the adverb *soo* and a light verb.
- 13 The main purpose of Heim (1997) is to argue that VPs, restrictive relative clauses, and NPs are semantically interpreted as formulas rather than one-place predicates. I will just touch on her analysis of VPE here. Heim’s analysis assumes the “trace theory” of movement. For attempts to recast the analysis of ACE in the “copy theory” of movement, see Fox (2002), Sauerland (2004), and references cited therein. As far as I can see, the choice between these theories does not affect the discussions in this paper as long as the base position of a DP ends up being interpreted as an e-type variable bound by the moved DP and appropriate adjustments are made in the expressions used in the conditions.
- 14 “LF” in this condition refers to the logical representation of both the discourse anaphor and its antecedent, which may be in two different sentences or utterances.
- 15 I have rephrased Heim’s (1997) “Appropriate Contrast Condition” here.
- 16 Free verbs (FVs) are capitalized in the examples. The word pronounced with a phonological prominence is shown in bold Italics. The judgments marked are mine.

- 17 The subscript “F” indicates the C-focused constituent and the strikeout indicates the deleted VP. The bracketed constituent marked β is the antecedent that allows VPE in the bracketed constituent marked α .
- 18 The double underline indicates the position from which the QR-ed quantified phrase moved.
- 19 I assume that cases of “backward ellipsis” are exceptions rather than the rule and that they are allowed only when the normal order can be “reconstructed” easily.
- 20 See Fischbacher (2007).
- 21 This program was used because its flexibility was suited to the necessities of the experiment and the availability of a computer lab designed to run the program.
- 22 Before the experiment, the subjects were asked to set the volume-level of the computer at a comfortable level.
- 23 When the circle or the area occupied by the chosen answer was clicked, a black dot appeared inside the circle. The program prevented more than two circles to be marked at the same time.
- 24 The expression used was intentionally “informal: 「1/2/3 を強く言えば、適格で自然」.
- 25 For experimental results indicating that normal speakers can appropriately mark the location of C-focus, see Selkirk (2002) and Katz and Selkirk (2011).
- 26 The subjects’ native dialect was not taken into consideration when analyzing the experimental results. The assumption was that they were at least competent listeners of Kansai dialect, being university students in Kyoto.

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日本語動詞句省略構文の容認性と解釈に 対比的焦点の位置が与える影響：パイロット実験

高 橋 眞 理

要 旨

対比的焦点の位置が日本語の動詞句省略を含む文の容認性と解釈に与える影響を調べるために、実験を実施した。対比的焦点の位置を被験者に明確に示すため、録音した実験文をコンピューターで自動再生できるよう実験プログラムを作成した。使用した一対の実験項目において、英語の動詞句省略復元可能性条件が要求する位置に対比的焦点があるものの方が、同位置に対比的焦点を持たないものより容認性が高いことを示す有意な結果が得られた。日本語にも英語と同じ復元可能性条件に従う動詞句省略が存在するという主張の、新たな支持が得られたと言える。

キーワード：動詞句省略，復元可能性条件，対比的焦点，日本語，自由動詞

