

Japanese learners' linking problems with English psych verbs

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Abstract. The main purpose of this study was to examine learners' states of acquisition of a specific grammatical item: psych(ological) verbs. Psych verbs are very difficult for learners of English to acquire and errors associated with them have been reported. However, until recently, little research has been done (ex. Chen 1997; Montrul 2001a, 2001b; White et al. 1998). The results obtained from previous studies are consistent in that learners have little difficulty with non-causative psych verbs and it is causative psych verbs that cause problems for learners. In this study, we did an experiment to test whether the same tendency would be observed among Japanese learners of English. The previous experimental studies are done within a UG-based framework. So the same framework was adopted in this study. The subjects in this study were 50 Japanese university students and 10 native speakers of English. Two tests were given to them: sentence completion test and grammaticality judgment test. The overall results showed that causative psych verbs were more problematic for the subjects. As far as sentence patterns and lexical items used in the experiment were concerned, the subjects had a difficulty with sentence patterns in which Theme appeared as the subject and a lexical item *fear*.

1. Introduction

How is the syntax of the lexicon acquired by Japanese learners of English as a second language? The acquisition of lexical aspects of language is deeply related with that of syntax and is crucial to language acquisition. Verbs, in particular, play an important role in that they determine the possible syntactic structures in which they occur. In this study, we will focus on psych verbs. Psych verbs are considered to have two semantic roles, Theme¹ and Experiencer. Theme is the cause of a change in the psychological state and Experiencer is the animate being which experiences the emotion. In (1a) and (1b), Experiencer is *John* and Theme is *the movie*. However, the syntactic position of these semantic roles are different in (1a) and (1b). In (1a), Experiencer appears at the subject position while in (1b), it occurs at the object position.

¹ The term *Theme* is not used here in broadly Hallidayan terms. *Stimulus* is also used for this semantic role.

- (1) a. John enjoyed the movie.
b. The movie delighted John.

This arbitrary mapping of arguments to syntactic positions seems irregular and this is assumed to pose learning problems.

Another problem, especially for Japanese learners, is that there are a lot of differences between English and Japanese. This is illustrated below.

- (2a) Sono shirase wa John o odorok-ase-ta.
the news TOP John OBJ surprise-CAUS-PAST
(2b) ‘The news surprised John.’
- (3a) John wa sono shirase ni odoroi-ta.
John TOP the news at surprise-ACTIVE-PAST
(3b) ‘John was surprised at the news.’

These two examples describe the same psychological state of *John's surprise at the news*. However, the verbs used in these pairs show a striking difference. In English, the root form of the verb is used as in (2b) while in Japanese, the causative suffix *-ase-* occurs on the root form of the verb *odorok-* in (2a). On the other hand, the root form is used in Japanese as in (3a) and the adjectival passive form is used in English as in (3b). This contrast causes problems for learners as the following errors produced by Japanese learners of English show.

- (4) *I delight watching the video.
(5) *We should not annoy death.

Following this, we will look at psych verbs in English and Japanese in section 2 and after reviewing previous studies on the acquisition of psych verbs in section 3, we will examine learners' states of acquisition of psych verbs by the empirical data in sections 4 and 5.

2. *Psych verbs in English and Japanese*

2.1 *English psych verbs*

In this study, Japanese serves as the L1 while English is the L2. English psych verbs have two types: Experiencer-subject verbs and Theme-subject

verbs. We will call the former class of verbs like (6a) as SE verbs and the latter class of verbs like (6b) as OE verbs according to Pesetsky (1995). With SE verbs like *fear*, the subject is Experiencer and the object is Theme while with OE verbs like *frighten*, the subject is Theme and the object is Experiencer.

- (6a) I fear an earthquake.
- (6b) An earthquake frightens me.

As the examples above indicate, the linking of arguments onto syntactic positions looks arbitrary and raises puzzles for a thematic hierarchy like (7) and the Uniformity of Theta Assignment Hypothesis (henceforth UTAH) proposed by Baker (1988) in (8).

- (7) (Agent (Experiencer (Goal/Source/Location (Theme))))
(Grimshaw 1990:8)
- (8) The Uniformity of Theta Assignment Hypothesis (UTAH)
Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure (Baker 1988).

In a thematic hierarchy, an argument with a particular semantic role is linked to a particular syntactic position. According to the thematic hierarchy proposed by Grimshaw in (7), an argument with Agent is linked to a position higher than an argument with Experiencer, which in turn is higher than arguments with Goal, Source, Location, which is higher than an argument with Theme. So the following sentence (9), observes the hierarchy in that Agent *Tom* is linked to a subject position and Theme *the ball* to an object position.

- (9) Tom hit the ball.

With regard to SE verbs, Experiencer is always higher than Theme and follows the hierarchy. So there are no linking problems with them. However, OE psych verbs with Theme as Subject violate the hierarchy in that Experiencer is lower than Theme.

As shown above, psych verbs have a peculiar characteristic in terms of linking. However, there are some solutions for this problem. For example, Belletti and Rizzi (1988) solved this problem by applying the same analysis of unaccusatives to OE psych verbs. They argue that both

types of psych verbs have the same D-structure in which Experiencer is in the subject position and Theme is in the object position. In the case of OE verbs, the underlying object moves to the surface subject position.

On the other hand, Pesetsky (1995) proposes two different thematic roles for Theme, which is assumed to be identical in both SE and OE verbs. In the case of SE verbs, the relevant semantic role is the Target or Subject Matter, while in OE verbs, the role is Causer. So *the TV set* in (10a) is Target or Subject Matter and it is Causer in (10b).

(10a) John worried about the TV set.

(10b) The TV set worried John. (Pesetsky 1995:57)

Having considered different approaches to solve the relation between psych verbs and UTAH, we cannot argue for Belletti and Rizzi (1988) in that Theme is still at a subject position and this poses a problem to learners. In a similar way, with regard to Pesetsky's (1995) analysis, even if Theme is called Causer, it is still in a subject position and causes learning problems.

2.1 Japanese psych verbs

Japanese psych verbs take two arguments. One argument is Experiencer marked by Nominative case *-ga* (or Topic case *-wa*) and the other argument is Theme marked by Accusative case *-o* as seen in (11a) or by Dative case *-ni* as seen in (11b).²

(11a) Taro wa jishin o kowaga-tta.

Taro TOP earthquake ACC fear-PAST

'Taro feared an earthquake.'

(11b) Taro wa jishin ni obie-ta.

Taro TOP earthquake DAT be frightened-PAST

'Taro was frightened at an earthquake.'

Thus, Japanese psych verbs has two types. One type has Theme marked by accusative *o* and the other type has Theme marked by *ni*. Sugioka (1992) calls the former type Accusative Construction and the latter type

² Endo and Zushi (1993:27-28) make a distinction between *o*-marked argument and *ni*-marked argument with regard to semantic roles. They argue that the semantic role of *o*-marked argument is Target and that of *ni*-marked argument is Causer.

Dative Construction. Verbs in Accusative Construction are given in group A and Verbs in Dative Construction are given in group B below.

Group A: Verbs taking accusative case *-o*

aisuru 'love', awaremu 'pity', keibetsu-suru 'despise', kirau 'dislike', kowagaru 'fear', nikumu 'hate', simpai-suru 'worry', sonkeisuru 'respect', tanoshimu 'enjoy', urayamu 'envy'

Group B: Verbs taking dative case *-ni*

komaru 'be troubled', kurushimu 'suffer', obieru 'be scared' odoroku 'be surprised', sitsuboosuru 'be disappointed'

However, there are some verbs which allow both Accusative and Dative cases as shown in group C.

Group C: Verbs taking accusative case-*o* and dative case *-ni*

kanashimu 'grieve', nageku 'deplore', tamerau 'hesitate' yorokobu 'be pleased'

Examples of groups A, B and C are shown in (12a), (12b) and (12c) respectively.

(12a) Hanako ga eiga o tanoshin-da.

Hanako NOM movie ACC enjoy-PAST

'Hanako enjoyed the movie.'

(12b) Hanako ga warui seiseki ni shitsubooshi-ta.

Hanako NOM bad grade DAT be disappointed-PAST

'Hanako was disappointed with the bad grade.'

(12c) Hanako ga sono shirase o/ni yorokon-da.

Hanako NOM the news ACC/DAT be pleased-PAST

'Hanako was pleased with the news.'

As the examples show, Japanese has Experiencer as Subject. However, it can have Theme as Subject seen in (13b), which sounds rather unnatural.

(13a) Taro wa tennis o tanoshi-nda.

Taro TOP tennis ACC enjoy-ACTIVE-PAST

'Taro enjoyed tennis.'

- (13b) Tennis wa Taro o tanoshim-ase-ta.
 tennis TO Taro ACC please-CAUSE-PAST.
 ‘Tennis pleased Taro.’
- (13c) *Tennis wa Taro o tannoshi-nda.
 tennis TOP Taro ACC please-ACTIVE-PAST.
 (Intended: ‘Tennis pleased Taro.’)

In (13a) and (13b), the positions of Experiencer argument *Taro* and Theme argument *tennis* are inverted. In (13a), Experiencer *Taro* appears as the subject which is higher than Theme *tennis*, so it corresponds to the word order of SE verbs in English. In (13b), Experiencer *Taro* appears as the object which is a lower position than Theme *tennis* as the subject, so it corresponds to the word order of OE verbs in English. Thus, Japanese allows the same lining pattern as in English. In Japanese, however, the sentence corresponding (13b) is a morphologically complex causative. In English, OE verbs are causative and the causativity is not marked by the overt morpheme while in Japanese, for verbs to be causative, the suffix *-(s)ase-* has to be added to a root form *tanoshim* like *tanoshim-ase-* in (13b). Without the overt causative morpheme, a sentence is ungrammatical as seen in (13c). Thus, zero causative morpheme of OE verbs is problematic to Japanese learners.

3. *Previous studies on the acquisition of psych verbs by L2 learners*

In this section, we will briefly summarize previous findings on L2 acquisition of English psych verbs. Until recently, little research has been done on the acquisition of psych verbs (Chen 1997; Juffs 1996a, 1996b; Montrul 2000, 2001a, 2001b; White 1995; White et al. 1998). The results obtained from previous studies are consistent in that learners had little difficulty with SE verbs and it was OE verbs that caused problems for learners. This tendency was observed with L2 learners with different L1s (e.g. Chinese and French learners in Chen 1997; Chinese learners in Juffs 1996a,b; Turkish and Spanish learners in Montrul 2000, 2001a,b; French, Malagasy and Spanish learners in White 1995; French, Japanese, Malagasy and Spanish learners in White et. al. 1998). These experimental studies are done within a framework of generative grammar and argue that L2 learners are largely guided by principles of UG such as UTAH and the Thematic Hierarchy not by properties of the L1 grammar. The research claims that when L2 learners are not sure about the linking of verbs, they rely on UTAH and the Thematic Hierarchy. Although this claim provides

evidence to support the availability of UG, there remain unsolved questions as to how universal principles and other factors such as L1 transfer and L2 input will interact each other. It is Montrul who explored this issue. Montrul (2000) proposes a modular view of transfer and claims that 'UG and L1 knowledge may not affect all linguistic domains in the same way at a given stage of development (2000:229)' and that 'transfer is subject to modularity in interlanguage grammars (2000:229)'.

The second finding was that L2 learners failed to identify zero causative morpheme of OE verbs. With regard to the issue of morphology, a series of Montrul's experimental studies (Montrul 2000, 2001a,b) investigate the relationship between lexical semantics and derivational morphology. For example, Montrul (2000) argues that L1 influence plays a role at the morphological level. She found that L2 learners whose L1s have the overt causative morpheme failed to accept English OE verbs with zero causative morpheme. Turkish learners are such a case. Montrul concluded that these learners transferred overt causative morphemes to L2 English and had difficulty in the acquisition OE verbs with zero covert causative morpheme. Although she did not have Japanese subjects, Japanese learners of English will be affected by the difference in morphosyntax pattern between Japanese and English. The same tendency in transfer of overt morphology was observed with Chinese learners of English in Juffs (1996a,b). Chinese has periphrastic causatives as English does. 'Shi' in Chinese corresponds to English 'make' in periphrastic causative construction. The subjects in the experiment preferred periphrastic construction more than zero causative OE transitive structure.

To sum up, learning problems caused by psych verbs will be attributed to the peculiar property in terms of linking and zero causative morpheme of OE verbs. With regard to the linking rule, Experiencer is always higher than Theme with SE verbs and there is no learning problem with them. However, OE transitive sentences with Theme as Subject violate this hierarchy in that Experiencer is not higher than Theme and this causes a problem to Japanese learners. Although Japanese has a structure with Theme as subject, the learners are expected to follow a canonical mapping rule in which Experiencer is mapped onto subject position and Theme is mapped onto object position when they are uncertain about the argument structure. Second, the zero causative morpheme of English OE verbs poses a problem to Japanese learners. They will assume that English has an overt causative morphemes like Japanese and as a result, reject OE transitive sentences with Theme as the subject and prefer periphrastic *make* causative sentences because causative is morphologically marked by *make*.

4. The experiment

4.1 Research questions

The following research questions are addressed in this study.

- (1) Are both types of psych verbs problematic to Japanese learners? Or are problems confined to OE verbs?
- (2) Are adjectival passives of OE verbs with Experiencer subject less problematic than transitive OE sentences with Theme as the subject?
- (3) Are periphrastic causative sentences less problematic than transitive OE sentences with Theme as the subject?

4.2 Hypotheses

- (1) SE verbs follow a canonical linking rule but OE verbs do not. Thus the problems will be confined to OE verbs.
- (2) Adjectival passive of OE verbs has Experiencer as the subject while OE transitive sentences has Theme as the subject. Thus, adjectival passive will be less problematic than OE transitive sentences to Japanese learners of English.
- (3) In periphrastic causative sentences, ‘make’ will be assumed to be a surrogate for Japanese causative morpheme by the learners. Meanwhile, OE verbs have no overt causative morpheme. Thus, periphrastic causative sentences will be less problematic than transitive OE sentences to Japanese learners of English.

4.3 Subjects

Subjects were 50 Japanese learners of English and they were classified into 5 proficiency levels from ‘Low’ to ‘High’ according to their scores on TOEIC, one of standardized English tests. Each group consists of 10 subjects. 10 native speakers of English also participated as a control group. Table 1 shows the mean scores and standard deviations on TOEIC of each group.

Table 1 The mean scores and standard deviations on TOEIC by group

Group (n=10)	TOEIC score	Mean	SD
Low	205-300	259.5	32.0
Low Intermediate	301-400	362.5	27.31
Intermediate	401-500	463.5	25.61
High intermediate	501-600	540.5	31.7
High	601-765	668.0	51.2

The difference between the scores of five Japanese groups on the proficiency test was significantly different from each other ($p < 0.001$). Thus, there are five experimental groups in all.

4.4 Tasks

The experiment consists of two tasks: sentence completion task (Task 1) and grammaticality judgment task (Task 2). Sentence completion task (Task 1) is a written elicited production task to test for learners' knowledge of the argument structure of verbs. There are five verb types to be tested and each verb type has five items. Thus, there are 25 questions in all. The verb types are as follows. The used verbs in each type are in parenthesis.

- 1 non-psych active verbs (cut, kick, make, pull, wash)
- 2 passive of non-psych active verbs (the same as the above)
- 3 SE verbs (envy, fear, hate, miss, respect)
- 4 OE verbs: transitive sentence
(disappoint, excite, frighten, interest, surprise)
- 5 OE verbs: adjectival passives (the same verbs as (4) above)

Learners are given a verb and two NPs and are asked to put the NPs before and after a verb to complete a grammatical sentence. Some examples are below.

- Ex. () disappointed (). [Tom, the news]
 () was interested in (). [the game, Tom]
 () missed (). [Tom, this town]
 () was pulled by (). [Tom, the rope]

The positions of NPs were randomized in order to control for possible effects of positions. In addition, to control for possible ordering effects, the test sentences were randomly ordered. Two NPs used are an animate and an inanimate NP. In addition to psych verbs, non-psych active verbs and passive of the active verbs were used to check whether the subjects

could make normal English sentences and whether the subjects know Theme can occur as the subject respectively. In the case of OE verbs, two sentence types, transitive sentences and adjectival passives, were used to investigate whether the learners would be affected by the sentence types.

Another task is Grammaticality Judgment task (Task 2). In this task, 8 sentence types were examined. A 3-point scale ranging from ‘-1’ (impossible) to +1 (possible) was used. The contexts leading to test sentences were given. The sentence types used for this task are as follows:

Ex. Mary took an examination.

- (a) She was disappointed with the result. (adjectival passives)
- (b) The result made her disappointed. (periphrastic causative)
- (c) The result was disappointing. (-ing adjectives)
- (d) The result disappointed her. (transitive sentence)
- (e) *The result was disappointed her.
- (f) *She was disappointing with the result.
- (g) *She disappointed the result.
- (h) *She disappointed with the result.

Out of eight sentence types, half of them are grammatical. Let us look at each sentence type. Types (a) and (b) were to check the learners’ knowledge of adjectival passives and periphrastic causative sentences respectively. Types (c) examined whether the learners would recognize the mapping rule of *-ing* adjectives. Type (d) was to test whether they would know the mapping rule of OE verbs. Types (e) and (f) tested their knowledge of ungrammatical mapping of rule of *-ed* and *-ing* adjectives respectively. Types (g) and (h) were to check whether they would recognize the ungrammatical word order of OE verbs.

5. Results

5.1 Sentence completion task

Table 2 shows mean inaccuracy scores on 5 verb types by learner.

Table 2 Mean inaccuracy scores on 5 verb types by group

Verb types Group	Non- psych active verbs (n=5)	Passive: non- psych verbs (n=5)	SE verbs (n=5)	OE verbs: transi- tives (n=5)	OE verbs: adj. passives (n=5)
Low (n=10)	0	0.5	0.8	2.9	0.9
Low int (n=10)	0.1	0.3	0.8	2.3	1.0
Intermediate(n=10)	0	0.4	0.3	2.2	0.2
High int (n=10)	0.1	0.4	0.2	2.4	0.1
High (n=10)	0	0.1	0.4	0.3	0
Controls (n=10)	0	0	0	0	0

Table 2 shows that subjects in all groups were very accurate on non-psych active verbs, passive of non-psych active verbs, SE verbs and adjectival passive of OE verbs. A repeated measures 2-way ANOVA showed that there were significant differences between the groups ($F(5,54)=6.564$, $p<.0001$) and verbs types ($F(4,214)=24.515$, $p<.0001$). Moreover, there was a significant interaction between group and verb type ($F(20, 216)=2.499$, $p<.001$). A post-hoc test (Scheffe test) showed that there were significant differences between OE verbs and the other verb types ($p<.05$). This indicates that OE verbs are most problematic to the learners. In the case of psych verbs, the performances on SE verbs and OE verbs were significantly different ($p<.05$). This shows that OE verbs were more problematic than SE verbs. With regard to syntactic frames in which OE verbs appear, the performance on the adjectival passive is significantly better than that on OE transitive sentences ($p<.05$).

From the results, we can say that problems were confined to OE verbs. OE verbs were more problematic than SE verbs to Japanese learners and they failed to accept OE transitive sentences with Theme as the subject and preferred adjectival passive of OE verbs with Experiencer as the subject. The results were consistent with our hypotheses 1 and 2.

Next we will look at individual results in Table 3. The performances by an individual subject are divided according to whether the subjects have acquired (1) both SE and OE verbs, (2) SE verbs but not OE verbs, (3) neither SE verbs nor OE verbs and (4) OE verbs but not SE verbs. Table 3 indicates an acquisition pattern of an individual subject on performances of psych verbs in Sentence Completion Task (Task 1) in which 5 OE verbs and 5 SE verbs are included. We assumed that if subjects make one or no error out of 5 psych verbs in each class, they acquired knowledge of each verb class. Table 3 gives the number of subjects showing acquisition of

OE and SE verbs.

Table 3 reveals that most of the subjects behaved as we hypothesized. Most of the subjects acquired SE verbs with the exception of 3 subjects at Low level. Most subjects who have not acquired both verb classes have problems with OE verbs as seen in the third column in the table. This result was consistent with our hypothesis. There were no subjects who acquired OE verbs but did not acquire SE verbs. With regard to subjects' proficiency, those at High level behaved in a similar way to control group.

Table 3 Number of subjects showing acquisition of OE and SE verbs

	(1)SE and OE acquired	(2)SE acquired, OE not	(3)SE and OE not acquired	(4)OE acquired, SE not	Total
Low (n=10)	2	5	3	0	10
Low Int (n=10)	3	7	0	0	10
Intermediate (n=10)	5	5	0	0	10
High Int (n=10)	5	5	0	0	10
High(n=10)	10	0	0	0	10
Controls (n=10)	10	0	0	0	10
Total	35	22	3	0	60

In Table 4, we will present the mean inaccuracy scores of SE verbs by verb.

Table 4 Mean inaccuracy scores by verb (SE verbs)

	hate	Fear	miss	respect	envy
Low (n=10)	0	0.3	0.1	0.2	0.2
Low Int (n=10)	0	0.3	0.1	0.2	0.2
Int (n=10)	0	0.3	0	0	0
High Int(n=10)	0	0.1	0	0.1	0
High (n=10)	0	0.5	0	0	0
Controls(n=10)	0	0	0	0	0

Table 4 shows that the subjects at all levels were very accurate on all verbs. There was a significant difference between the groups ($F(5,54)=2.462, p<.05$). In addition, there was a significant difference between the verbs ($F(4,216)=8.592, p<.0001$). This was due to the poor performance on *fear*. Scheffe test showed that this verb was significantly more difficult than the other four verbs. In White et al. (1998), it is reported that this verb was problematic. There was no significant interaction between group and verb type ($F(20,216)=1.249, p=.2167$). With respect to the learners' poor performance on *fear*, this tendency was observed regardless of the learners' L1s as White's group indicated. One of the possible factors will be L2 input provided by textbooks as far as Japanese learners are concerned. An analysis of Japanese textbooks in Sato (in press) indicated that the frequency of this lexical item was very low.

Next, let us look at OE verbs below. Table 5 indicates mean inaccuracy scores of OE verbs by verb.

Table 5 Mean inaccuracy scores by verb (OE verbs)

	surprise	Disappoint	excite	Interest	frighten
Low (n=10)	0.5	0.6	0.5	0.6	0.7
Low Int (n=10)	0.3	0.4	0.5	0.4	0.7
Int (n=10)	0.4	0.5	0.5	0.4	0.4
High Int(n=10)	0.5	0.5	0.6	0.4	0.4
High (n=10)	0.	0.1	0.1	0.1	0
Controls(n=10)	0	0	0	0	0

Table 5 shows that the subjects at all levels behaved in a similar way to all of the OE verbs. Although there is a problem with a specific lexical item with SE verbs, this tendency was not observed with OE verbs. There was a significant difference between the groups ($F(5,54)=3.968, p<.005$) but no significant difference between the verbs ($F(4,216)=1.646, p=.1638$). There was no significant interaction between group and verb ($F(4,216)=1.478, p=.0911$).

To sum up, we obtained the result that OE verbs are more problematic than SE verbs to the learners. Then we will focus on OE verbs and give a grammaticality judgement test to examine whether the learners will have the correct knowledge of syntactic frames in which OE verbs appear.

5.2 Grammaticality judgment task

In this task, the subjects are asked to judge a sentence in which OE verb is used. The same OE verbs as in Task 1 were used in this task. Eight sentence types are used and abbreviations for each sentence type in the Table 6 are as follows:

- (a) pas : adjectival passive ex. She was disappointed with the result.
- (b) peri: periphrastic causative ex. The result made her disappointed.
- (c) -ing : *-ing* adjectives ex. The result was disappointing.
- (d) vt: transitive sentence ex. The result disappointed her.
- (e) *Theme+pas: ungrammatical passives with Theme subject
ex. *The result was disappointed her.
- (f) *Exp+-ing adj.: ungrammatical passives with *-ing* adjective
ex. *She was disappointing with the result.
- (g) *Exp+vt: ungrammatical transitive sentence with Experiencer subject
ex. *She disappointed the result.
- (h) *Exp-vt-pp: ungrammatical adj.passive without be-verb
ex. *She disappointed with the result.

Sentences (a) – (d) are grammatical and (e) – (h) are ungrammatical.³ If the subjects judge a sentence as grammatical, they give it a score of 1 while if they judge a sentence as ungrammatical, they give it a score of -1. If they are not sure, they give it a score of 0. As each sentence type has 5 verbs, the total scores of grammatical sentence type is 5 and those of ungrammatical sentence type is -5.

The mean scores were positive on the grammatical sentences although the mean score on *-ing* adjectives is close to zero. The poor performance on this sentence type is due to the fact that only the subjects at High level and control group accepted this as grammatical. With regard to ungrammatical sentence types, their scores were negative with the exception of Low level learners. Low level learners' scores on ungrammatical passives with Theme subject and ungrammatical adjectival passives missing *be* verb were positive. The subjects' failure to reject ungrammatical passives with Theme subject was not consistent with our prediction. If Theme as Subject is problematic to the learners, it would be rejected more. Only High level learners was accurate with this sentence type. These results indicate that the learners do not accept Theme as

³ The test sentences were made based on the errors produced by Japanese learners in Longman Learner's Corpus. See Sato (1998) for the details.

Subject but this does not necessarily mean that they can correctly reject ungrammatical sentence with Theme as Subject especially at the beginning stage of acquisition.

Table 6 Grammaticality Judgement task: mean scores by sentence type

	Pas	peri.	-ing	vt.	*Theme +pas	*Exp+ -ing adj	*Exp+ vt	*Exp+ vt+pp
Low (n=10)	1.7	2.1	-0.9	1.2	0.1	-0.2	-0.4	0.4
Low Int (n=10)	3.1	1.6	-0.1	0.9	-1.6	-0.5	-0.6	-0.5
Intermediate (n=10)	4.4	2.4	-0.7	1.6	-2.9	-2.7	-3.a0	-2.2
High Int (n=10)	3.4	1.9	-0.6	1.2	-2.5	-2.4	-2.8	-1.8
High (n=10)	4.4	0.8	1.0	3.8	-4.5	-3.9	-5.0	-4.1
Controls (n=10)	5.0	4.0	4.8	5.0	-5.0	-5.0	-5.0	-5.0
Average score	3.7	2.1	.58	2.9	-2.7	-2.5	-2.8	-2.3

A repeated measures 2-way ANOVA showed that there were significant differences between the groups ($F(5,54)=8.918, p<.0001$) and verbs types ($F(7,378)=11,740, p<.0001$). Moreover, there was a significant interaction between group and verb type ($F(35, 378)=1.981, p<.005$). A post-hoc test (Scheffe test) showed that there were significant differences between adjectival passives and the other sentence types ($p<.05$) and also between *-ing* adjectives and the other sentence types ($p<.05$). These results show that adjectival passives were easiest to judge as grammatical by the learners and *-ing* adjectives were most difficult to judge as grammatical by them. The mean score on adjectival passives was significantly higher than that on OE verbs. Thus, our second hypothesis was confirmed. The poor performance on *-ing* adjectives can be interpreted as further evidence supporting our hypothesis that Theme subject is problematic to the learners.

The score on *-ing* adjectives was significantly lower than that on transitive OE sentences. This indicates that the learners did not behave in a similar way to sentences with Theme as the subject. OE transitive sentences were significantly more accepted than *-ing* adjectives. With regard to the third hypothesis of overt morphology, there was no significant difference between *make* periphrastic constructions and transitive OE sentences. Thus, the hypothesis was not confirmed. This result indicates that *make* did not seem to function as a surrogate for Japanese causative morpheme.

5. Discussion

From the experiment, we found that Japanese learners of English had more difficulty with OE verbs than SE verbs and the first hypothesis was confirmed. With regard to the second hypothesis, Japanese learners accepted adjectival passives (the mean score was 3.7) more than OE transitive sentences with Theme as Subject (the mean score was 2.9). Thus, this result was consistent with our hypothesis. The learners were also inaccurate with rejecting ungrammatical OE verbs with Theme as Object (the mean score was -2.8). This result reveals that Theme subject is problematic to the learners. This tendency was observed especially with *-ing* adjectives in terms of sentence types and also *Low* and *High-Low* level learners (the mean score was -0.4 for *Low* learners and -0.6 for *High-Low* learners) in terms of learners' proficiency level. These findings were consistent with the previous work having the subjects with different L1s.

Lastly, it was hypothesized that *make* in periphrastic construction would serve as a surrogate for Japanese causative morpheme. Contrary to our hypothesis, the learners' acceptance of periphrastic causative construction was lower (the mean score was 2.1) than OE transitive sentences although there was no significant difference between them. This will be partly due to the fact that Japanese causative morpheme *-(s)ase* is a bound morpheme but *make* in periphrastic sentence is not. If transfer of morphology do occur, it will be more accurate to say that bound morpheme will be transferred into English. This needs to be further investigated. With respect to this construction, the control group behaved differently towards this construction from the other constructions: their mean score was lowest. The control group's low acceptance of the periphrastic causative suggests that periphrastic causative is less common than simple transitive causative. The frequency can be one of factors to affect the experiment.

To summarize, this empirical study examined Japanese learners' states of acquisition of psych verbs. Previous studies have shown that OE verbs are problematic to L2 learners and this study confirmed the results with Japanese learners.

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Appendix**[1] Sentence Completion task (task 1)**

Complete the following sentences with the given two words

Ex. () had (). [lunch, Mary] → Mary had lunch.

1. () cut (). [the fish, Tom]
2. () was made by (). [Tom, a cake]
3. () hate (). [this town, Tom]
4. () surprised (). [the news, Tom]
5. () was frightened by (). [Tom, the fire]
6. () disappointed (). [Tom, the news]
7. () was interested in (). [the game, Tom]
8. () was pulled by (). [Tom, the rope]
9. () made (). [Tom, a cake]
10. () feared (). [the water, Tom]
11. () was surprised at (). [Tom, the news]
12. () excited (). [the game, Tom]
13. () washed (). [the car, Tom]
14. () was kicked by (). [a ball, Tom]
15. () missed (). [Tom, this town]
16. () pulled (). [Tom, the rope]
17. () was cut by (). [the fish, Tom]
18. () interested (). [the game, Tom]
19. () respected (). [the hard work, Tom]
20. () kicked (). [a ball, Tom]
21. () was disappointed by (). [Tom, the news]
22. () frightened (). [Tom, the fire]
23. () envied (). [Tom, Bill's wealth]
24. () was washed by (). [the car, Tom]
25. () was excited about (). [the game, Tom]

[2] Grammaticality Judgement Task (Task 2)

Judge the following sentences with the scale of '1' (grammatical), '0' (not sure) and '-1' (ungrammatical).

Mary heard that her favorite rock star was coming to town.

- a. The news excited her.
- b. The news was exciting.
- c. The news was excited her.
- d. She was exciting about the news.
- e. She was excited about the news.
- f. She excited the news.
- g. She excited about the news.
- h. The news made her excited.

2. Mary took an examination.

- a. The result was disappointing.
- b. She was disappointing with the result.
- c. The result made her disappointed.
- d. The result was disappointed her.
- e. She disappointed with the result.
- f. The result disappointed her.
- g. She disappointed the result.
- h. She was disappointed with the result.

3. Mary studied physics at university.

- a. A story of Newton made her interested.
- b. She interested in a story of Newton.
- c. She was interesting in a story of Newton.
- d. A story of Newton interested her.
- e. She was interested in a story of Newton.
- f. A story of Newton was interested her.
- g. She interested a story of Newton.
- h. A story of Newton was interesting.

4. Mary was all alone in the big house.

- a. She was frightening by a sudden noise.
- b. A sudden noise was frightening.
- c. She frightened a sudden noise.
- d. A sudden noise made her frightened.

- e. She was frightened by a sudden noise.
 - f. A sudden noise was frightened her.
 - g. She frightened by a sudden noise.
 - h. A sudden noise frightened her.
5. Tom told Mary that he was going to get married.
- a. Her reaction surprised Tom.
 - b. Her reaction was surprised her.
 - c. She was surprised at his reaction.
 - d. She surprised his reaction.
 - e. Her reaction made her surprised.
 - f. She was surprising at her reaction.
 - g. She surprised at her reaction.
 - h. Her reaction was surprising.