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Do EFL Textbooks in Japan Cause Lexical Priming?

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The question of whether or not government-approved Japanese EFL textbooks lead Japanese learners of English to have a false impression regarding stative verbs is explored in this research. To this end, three kinds of language data are analyzed: the Corpus of Contemporary American English (COCA), a textbook corpus sourced from all the government-approved textbooks for junior high students, and test results from 189 junior high students. Comparing a textbook corpus with the COCA corpus suggests that textbooks do not adequately reflect language patterns occurring in American English. Stative verb usage by learners is compared with that in textbooks, revealing that the longer learners are exposed to textbooks, the better their knowledge mirrors the contents of the textbooks; however, this correlation does not necessarily mean learner language development. Research findings attest that Japanese EFL textbooks treat stative verbs in a way that differs from real world usage, negatively affecting learners' language development.

本研究では、日本で使われている英語検定教科書が日本人英語学習者による状態動詞の使用に対して、誤った解釈を与えているかどうかを検証する。これはCOCAコーパス、教科書コーパス、そして189名の中学生に実施されたテスト結果の比較・対照によって導かれる。教科書コーパスとCOCAコーパスの比較により、教科書がCOCAコーパスにおける言語使用を反映しきれていないことを明らかにする。テスト結果と教科書コーパスの比較により、学習者が教科書を使用するにつれ、その知識はより教科書内容を反映したものになることを明らかにする。本研究で明らかにされる学習者知識と教科書内容の相関関係は、学習者言語の発達を意味しているわけではない。これらの結果から、教科書と実際の言語使用との違いが学習者に否定的な影響を与える可能性があることを主張する。

In situations where people learn English as a second language, they are exposed to English outside the classroom and throughout their daily lives. In contrast, people who learn English as a foreign language (EFL) tend to receive far less input in English, leading to the well-known phenomenon of reliance on textbook language for English input; thus, EFL textbooks are considered to strongly affect EFL learners' language use (Elorza & Garcia-Riaza, 2010; Matsuda, 2002). However, this effect may be even more pronounced in Japan than in other countries, as English classes in Japan have tended to be constructed closely around textbooks (Hino, 1988). The Benesse group (Benesse Educational Research and Development Center, 2014) surveyed a total of 6,294 junior and senior high school students and revealed that about 75% of them studied English outside school based on teaching materials including textbooks or handouts, suggesting the importance of developing textbooks that accurately represent typical usage patterns. The current study explores how Japanese EFL textbooks authorized by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) influence learner language from the standpoint of lexical priming (hereinafter, LP).

Hoey (2005) discussed LP concerning vocabulary knowledge and developed what is now referred to as lexical priming theory, the idea that every word tends to co-occur with other particular linguistic features such as other words or grammatical patterns. We acquire such tendencies through repeated exposure to them in multiple contexts. In other words, input constructs our perception of how each lexical item behaves.

Recent studies identify similarities between learners' language use and the contents of English textbooks (e.g., Viana, 2006; Xu, 2015) or gaps between language as it is used in the real world and as it appears in textbooks (e.g., Abdollahi-Guilani, Yasin, & Hua, 2011; Mukundan & Khojasteh, 2011; Römer, 2005). To my knowledge, however, few researchers have paid attention to how gaps between the English used in the real world and that in English textbooks affect learner language. Identifying such gaps could lead us to make suggestions for the improvement of EFL textbooks. This paper, therefore, is an attempt to address this gap in the literature.

Research Questions

To investigate how EFL textbooks authorized by MEXT (hereinafter, MEXT textbooks) affect learner language, two research questions were proposed:

- RQ1. Do EFL MEXT textbooks cause LP on Japanese EFL learners' language beliefs?
- RQ2. If so, does this have a facilitative or debilitating effect on Japanese EFL learners' beliefs?

The key point in addressing the first question is whether or not learners' knowledge mirrors the contents of MEXT textbooks. If so, we can argue that it is an example of LP of teaching materials on learners' language beliefs.

Acquiring LP that matches language use occurring in the real world would be helpful for learners; however, LP may have a debilitating effect on learners' language development, and this can often come from teaching materials. McEnery (as cited in Hoey, 2005, p. 186) argued that unhelpful LP may occur when textbooks overemphasize one pattern of the language over another, or when they explain language patterns incorrectly (Hoey, 2005). In Japan, where textbooks are the primary source of input, unhelpful LP may arise when materials are developed without consideration for natural language use, which is one of the reasons that motivated me to propose the second question. To answer this question, attention will be paid to whether or not MEXT textbooks reflect language patterns occurring in the real world.

As mentioned above, researchers have revealed gaps in language use between English textbooks and natural language use with an eye towards helping improve the contents of textbooks. In the same way, this research looks critically at the quality of MEXT textbooks, with the aim of helping curriculum developers to make more pedagogically sound materials in the future.

Methodology

Target Lexical Items

As a first step for studies on LP in Japanese EFL settings, this research was focused on junior high students' (hereinafter, JHSs) language beliefs. The language patterns selected for investigation were the progressive form (PF) and the simple aspect (SA) of stative verbs; stative verbs to be considered were *be*, *have*, *know*, *look*, *live*, *mean*, *stand*, and *think*. Samples of eight of the frequent stative verbs were selected from 1st-year JHS MEXT textbooks for analysis. The reason for selecting this grammatical feature was that Japanese EFL learners are taught both stative verbs and the PF when they are in 1st year

at junior high school. Furthermore, one of the best-selling MEXT textbooks, *New Crown 1* (Negishi et al., 2016), explains that such verbs cannot take the PF. Recent studies, on the other hand, claim that stative verbs can take the PF (Biber, Johansson, Leech, Conrad, & Finegan, 1999; Leech, Hundt, Mair, & Smith, 2009), especially in American TV series, commercials, magazines, or books (Smiecinska, 2002), implying that stative verbs in the PF can potentially cause unhelpful LP for Japanese EFL learners.

Language Data

Three kinds of language data have been adopted for the purpose of this research: the Corpus of Contemporary American English (COCA), a corpus of JHS MEXT textbooks, and test results of a multiple-choice test of stative verb use.

The COCA (Davies, 2008) is one of the largest freely available corpora representing American English. This corpus has 20 million words added every year and consists of more than 600 million words of text (as of 2019). The corpus is equally divided into five language genres: *magazine*, *spoken*, *fiction*, *newspaper*, and *academic*. Because this corpus is too large to analyze all occurrences of a language feature, a random selection of 500 examples was extracted for each of the eight stative verbs to estimate how each verb behaves in the corpus.

Unfortunately, there are no freely available corpora of MEXT textbooks, so a corpus was created for the current study by collecting all the JHS MEXT textbooks in current use (as of 2018), scanning them into a computer, and then utilizing optical character recognition software to generate machine-readable files that could be assembled into a corpus for analysis. The final corpus comprised six series of MEXT textbooks, each with three levels, for a total of 18 books. Data were obtained solely from the reading passages in the books. The completed corpus contained approximately 30,000 tokens. *WordSmith Tools 7* (Scott, 2016) was adopted for the purpose of textbook analysis. Among the several features available in this software, only the concordances tool was used to call up concordances having each of the eight stative verbs.

To measure learners' knowledge of stative verbs, a 17-question multiple-choice test was administered to 1st, 2nd, and 3rd-year Japanese JHSs in the Kanto region ($n = 65, 66, 58$ respectively) after obtaining their informed consent. Following previous research (McLean, Hogg, & Kramer, 2014; McLean, Kramer, & Stewart, 2015), their language proficiency was estimated as intermediate from the point of view of *hensachi*, which is an index parameter widely used in Japan to evaluate the knowledge-level of learners. Due to privacy issues, I could not obtain other parameters such as scores of Eiken, which is

one of the most frequently used tests in Japan to measure learners' English proficiency, making *hensachi* the best choice for this experiment.

It was decided to use a controlled productive knowledge test rather than a test of free productive knowledge because the participants were just beginning to learn English, and the input they had received in an EFL environment would not have been enough to produce applicable forms without any help. The test had four answer patterns in which

1. both the PF and the SA of stative verbs were correct,
2. only the PF of stative verbs was correct,
3. only the SA of stative verbs was correct, and
4. only the past tense of stative verbs was correct (see Appendix for full test).

One example follows:

My hometown is in Iwate. But now, I () in Tokyo because my company is there.

- a. live
- b. am living
- *c. lived

The participants were asked to identify inappropriate forms (*) rather than appropriate ones for each question. If a test requires learners to choose an appropriate form, we cannot obtain a clear picture of learners' knowledge of stative verbs because choosing either the SA or PF would not necessarily imply a lack of knowledge regarding the other. This possibility can distort our interpretation of test results, especially when there were two applicable forms. That is, learners may just choose either the SA or PF even if they understand that both forms are applicable. If the participants perceive applicable forms as incorrect, it could indicate a lack of knowledge, so in this test, the participants were asked to choose inappropriate forms.

Pattern 4 was excluded from the scope of the analysis. The main purpose of types 1 to 3 was to see learners' knowledge regarding the two stative verb forms. To answer correctly, they needed to pay attention to both forms and find inapplicable forms. The fourth type of question would not have required the participants to think as much because this type included adverbials indicating the past tense, and only inapplicable forms took the past tense form. That is, the answer was obvious. If all the questions had been set up as types 1-3, the participants might have noticed the aim of the test and answered the questions without thinking. I tried to reduce this risk by adding the fourth type of question.

Data Analysis

Comparison of the COCA Corpus With the Textbook Corpus

Table 1 compares the frequency of occurrence of the two forms in the MEXT textbook corpus and in the COCA corpus.

Table 1. Summary of Frequency of Occurrence of SA, PF, and Stative Verb Forms

Source	SA	PF	Stative verb
MEXT textbooks			
1st-year textbook	627	3	744
2nd-year textbook	724	5	955
3rd-year textbook	569	7	1030
Total	1920	15	2729
COCA	2286	134	4000

Note. PF = progressive form, SA = simple aspect (SA).

There seem to be no large differences in the overall frequency of the two forms between the two corpora. To investigate whether or not MEXT textbooks statistically significantly overstressed the SA over the PF relative to the COCA, a two-way Chi-square test of independence was performed.

Table 2. Result of a Chi-Square Test (Data From Table 1)

Source	Frequency of occurrence		χ^2	df	Cramer's V*
	SA	PF			
Textbooks	1920	15	73.7916**	1	.13
COCA	2286	134			

Note. *Cramer's V is a measure of effect size and ranges from 0-1; .10 means a small effect size; .30 means a medium effect size; .50 means a large effect size (Mizumoto & Takeuchi, 2008).

** $p < .001$.

This statistical test showed a significant difference, meaning that JHSs were significantly more likely to encounter the SA rather than the PF.

Next, let us consider in which contexts the PF of stative verbs tends to emerge. In Table 3, each number represents the number of textbooks presenting the PF of stative verbs; the numbers in parentheses mean the number of textbook types presenting this use.

Table 3. Distribution of Genres in Which the PF of Stative Verbs Emerged

Source	Genre					
	Letter	Spoken	Fiction	Email	Newspaper	Academic
MEXT textbooks						
1st-year textbook	0	3	0	0	0	0
2nd-year textbook	1	3	0	0	1	0
3rd-year textbook	0	4	0	2	0	1
Total	1(1)	10(4)	0(0)	2(1)	1(1)	1(1)
COCA						
	21	34	47	0	23	9

Note. PF = progressive form.

First and most importantly, MEXT textbooks presented the PF of stative verbs in spoken discourse with the most frequency, whereas in the COCA, they emerged in fictional contexts with the most frequency. It can also be worth mentioning that in MEXT textbooks, there were no instances of the PF of stative verbs occurring in fictional contexts, implying that Japanese learners may not experience this use in the context that they are more likely to meet outside the classroom. However, the preference for the PF of stative verbs in spoken discourse in the COCA corpus seems to have been reflected in MEXT textbooks.

It could be interesting to note that JHSs in Japan generally study English with only a single type of textbook; thus, as Table 3 implies, most students have few chances to experience this use in a wide range of contexts.

Analysis of Test Results

Participants' responses to questions for which only the SA of stative verbs was correct and those for which only the PF of stative verbs was correct are summarized in Table 4 and Table 5 respectively. Both tables show the total number of correct and incorrect responses to questions. In addition, in order to investigate whether or not there were any statistical differences in participants' responses, a two-way Chi-square test of independence was performed. Because this test showed statistical significance for the data in Table 4, multiple comparison tests were performed to investigate whether or not there were any significant differences in the rates of correct responses between learners of different years. Results of these statistical tests are also included in the tables.

Table 4. Responses and Results of Statistical Tests When Only the SA or PF of Stative Verbs Was Correct

	Correct response	Incorrect response	Total	χ^2	df	Cramer's V*
JH1	109	216	325	57.7437***	2	.2471
JH2	120	210	330			
JH3	178	112	290			
Multiple comparison tests (<i>p</i> value adjusted with Bonferroni method)						
				χ^2	df	Cramer's V
JH1 vs. JH2				.5748	1	.0247
JH1 vs. JH3				47.7272**	1	.2247
JH2 vs. JH3				38.6951**	1	.2024

Note. JH = junior high, PF = progressive form, SA = simple aspect (SA).

*Cramer's V is a measure of effect size and ranges from 0-1; .10 means a small effect size; .30 means a medium effect size; .50 means a large effect size (Mizumoto & Takeuchi, 2008).

***p* < .001.

Table 4 indicates that as learners move on to the next year level, they come to correctly identify stative verbs in the SA at progressively higher levels. Results of multiple comparison tests showed the differences between 1st-year and 3rd-year students as well as 2nd- and 3rd-year students were statistically significant, implying that 3rd-year

students had acquired the use of stative verbs in the SA much better than did 1st- or 2nd-year students.

In contrast to the situation where only the SA was correct, as learners move on to the next year level, they tend to incorrectly reject the PF of stative verbs, as illustrated in Table 5. This table seems to show a downward trend for the participants' responses; however, there is no statistical significance among the data.

Table 5. Responses and a Chi-square Test Result When Only the PF of Stative Verbs was Correct

	Correct response	Incorrect response	Total	χ^2	df	Cramer's V*
JH1	148	177	325	2.7143	2	.0536
JH2	133	197	330			
JH3	134	156	290			

Note. JH = Junior high.

*Cramer's V is a measure of effect size and ranges from 0-1; .10 means a small effect size; .30 means a medium effect size; .50 means a large effect size (Mizumoto & Takeuchi, 2008).

Lastly, we look at how testees responded to questions in which both the SA/PF of stative verbs were correct (Table 6).

Table 6. Participants' Responses When Both SA and PF of Stative Verbs Were Correct

Level	SA	PF	Completely correct	Completely incorrect	Total
JH1	87	115	106	17	325
JH2	92	97	92	49	330
JH3	118	62	83	27	290

Note. PF = progressive form, SA = simple aspect, JH = junior high.

Here, it could be worth reporting that among the three years, the group that got completely correct answers (i.e., those who correctly identified both the forms) the most often were the 1st-year students. In addition, those who selected completely incorrect answers (i.e., those who mistakenly identified both the forms) the least often were, again, the 1st-year students. This may seem strange because in a normal situation, our expectation would be that the amount of time studied and exposure to textbooks would positively correlate with improvement in learners' language proficiency.

In this type of question, the focus of analysis is on which form testees typically found correct; therefore, the data in Table 6 are analyzed further in Table 7 and Table 8 to make learners' preferences for the two forms clearer. The two tables respectively highlight those who perceived only the SA as correct and those who perceived only the PF as correct. Because a Chi-square test showed statistical significance for the data in both the tables, multiple comparison tests were performed.

Table 7. Participants Who Perceived Only the SA as Correct

Level	SA	Other responses	Total	χ^2	df	Cramer's V*
JH1	87	238	325	16.7447***	2	.1331
JH2	92	238	330			
JH3	118	172	290			

Multiple comparison tests (*p* value adjusted with Bonferroni method)

	χ^2	df	Cramer's V
JH1 vs. JH2	.1015	1	.0104
JH1 vs. JH3	13.3636***	1	.1186
JH2 vs. JH3	11.3099**	1	.1094

Note. SA = simple aspect, JH = junior high.

*Cramer's V is a measure of effect size and ranges from 0-1; .10 means a small effect size; .30 means a medium effect size; .50 means a large effect size (Mizumoto & Takeuchi, 2008).

p* < .01. *p* < .001.

Third-year students seemed to more strongly believe that only the simple aspect was an applicable form, as compared to the other years. This table uncovered a correlation between the amount of exposure to MEXT textbooks and participants' increasing preferences for the SA. Looking at the total number of participants who found only the PF as correct, however, results showed an opposite trend against the previous case.

Table 8. Participants Who Perceived Only the PF as Correct

Level	PF	Other responses	Total	χ^2	<i>df</i>	Cramer's <i>V</i> *
JH1	115	210	325	16.3109***	2	.1280
JH2	97	283	330			
JH3	62	228	290			
Multiple comparison tests (<i>p</i> value adjusted with Bonferroni method)						
		χ^2		<i>df</i>		Cramer's <i>V</i>
JH1 vs. JH2		8.0961**		1		.0902
JH1 vs. JH3		14.6654***		1		.1214
JH2 vs. JH3		1.5628		1		.0396

Note. PF = progressive form, JH = junior high.

*Cramer's *V* is a measure of effect size and ranges from 0-1; .10 means a small effect size; .30 means a medium effect size; .50 means a large effect size (Mizumoto & Takeuchi, 2008)

** *p* < .05. ****p* < .001.

As the data show, the amount of exposure to MEXT textbooks negatively correlates with participants' knowledge regarding the PF of stative verbs. In sum, analyzing participants' responses to this type of question may lead us to expect that as students are exposed to MEXT textbooks, they come to prefer stative verbs in the SA and to mistakenly reject the PF of stative verbs.

Discussion and Conclusion

The primary questions in this study were (a) do EFL MEXT textbooks cause LP on Japanese EFL learners' language beliefs? and (b) if so, does this have a facilitative or debilitating effect on Japanese EFL learners' beliefs?

The results of this research answered positively to the first research question because learners' knowledge mirrored the contents of textbooks. If an LP effect had not been occurring for learners' knowledge, the test results would not have shown similar trends. The textbook analysis results showed that MEXT textbooks overemphasized stative verbs in the SA over the PF. The test results showed that as learners were exposed to MEXT textbooks, they came to correctly identify and prefer the SA over the PF, whereas their acceptance of the PF became lower and lower. These facts imply that learners' beliefs about stative verbs closely correlated with what they had been exposed to in MEXT textbooks. We might interpret this result as being due to the large difference in exposure between the two verb forms, and this had an increasing LP effect on learners' knowledge of stative verbs as each additional year of schooling went by.

One point to consider is that many more 1st- and 2nd-year students accepted the PF of stative verbs than did 3rd-year students. In some questions where only the SA was correct, 1st- and 2nd-year students marked the PF as correct, rather than the SA. Although this differed from the trends in MEXT textbooks, this fact does not necessarily discount the LP effect of stative verbs on learners' beliefs. In the first place, Hoey's LP theory holds that we acquire language use of word(s) through cumulative experiences, meaning that we need enough exposure to each word so that we can be primed. Hence, 1st- and 2nd-year students' higher acceptance of the PF would not imply that there was no LP but rather was an indication of the existence of LP.

One might point out that the total number of correct responses to questions where only the PF was correct did not widely differ for each year, as multiple comparison tests did not show statistical significance. Specifically, 3rd-year students' responses to this type of question might be opposite to our expectation, because if they incorrectly understood the case where stative verbs took the PF due to LP, their total number of correct answers should have been much lower than what we have seen. However, we need not see this result as a counterexample to the existence of LP. Here again, let us consider the following of question:



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- Aki: Ken, let's play in the park!
Ken: Sorry, Aki. I () lunch now.
a) am having
*b) have
*c) had

In this type of question, verb forms used in choices were composed of the SA and PF. As is evident from Table 4, many more 3rd-year students were able to correctly identify stative verbs in the SA than could the 1st- and 2nd-year students. Hence, there was a possibility that 3rd-year students might have answered this type of question by a process of elimination. This would give us the impression that their beliefs resembled the contents of textbooks, again indicating that an LP effect was occurring for learners' beliefs.

For the second research question, analyzing the results uncovered a clear trend towards textbooks overstressing the SA over the PF relative to the COCA, the difference that was found to be statistically significant. Genre analysis also revealed a discrepancy between the two corpora.

The test data suggest that the amount of exposure to MEXT textbooks did not positively correlate with an improvement in learners' language proficiency. Specifically, many 1st- and 2nd-year students tended to have correctly accepted stative verbs taking the PF, whereas 3rd-year students seemed to have incorrectly rejected that case. This implies that the longer learners are exposed to textbooks, the less likely they will be able to identify another correct pattern of stative verbs (i.e., stative verbs in the PF). In other words, the mismatch in language use between the textbook corpus and the COCA corpus had a debilitating effect on learners' knowledge. What has been discussed so far would lead us to conclude that MEXT textbooks seem to prime JHSs to use stative verbs in a way that differs from how they are used in American English.

Suggestions for Further Research

In this study, I investigated whether LP from MEXT textbooks occurs for JHSs' stative verb beliefs, and if so, whether this is helpful or not for learners. The results provided empirical evidence that it was indeed the case that LP occurred and the LP was not always helpful. These findings were only for beliefs regarding stative verbs, though. Further research should consider whether LP occurs for other lexical items that might

lead learners to establish misconceptions of correct grammar patterns. Such findings could help to improve MEXT textbooks. According to Hoey (2005), education can potentially replace an individual's LP with new LP, and this replacement occurs when we face other usage patterns than those we have previously been exposed to and adopt the new ones. This may lead us to conduct studies on pedagogy that can replace the existing unhelpful LP with more helpful LP. Conducting lessons based on data-driven learning (DDL) can be an approach to combat learners' unhelpful LP. By providing students with concordance lines of authentic texts, they may be able to work out how a word or a phrase is actually used in the real world, meaning there would be a chance for learners to replace their existing unhelpful LP with helpful LP.

Overall, the findings in this study suggest that textbooks should be developed based on corpus findings in order to prevent learners from acquiring unhelpful LP. To a certain extent, it is unavoidable that the textbooks in use today do not cover all the usage in relation to one lexical item. To address this issue, we need to conduct more research (a) so that teachers can be ready for teaching authentic language, and (b) to consider how teachers can provide students with more helpful LP in the future.

Bio Data

Shusaku Nakayama is currently a doctoral student at Meiji Gakuin University in Tokyo, Japan. He has been working at a senior high school as an English teacher for 3 years. His interests include corpus linguistics, textbook analysis, and teaching English as a foreign language. <shusaku-nakayama@outlook.jp>

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Appendix

Multiple-Choice Test Used in this Study

- Are you okay? You () tired.
 - are looking
 - are looked*
 - look
- He () two pens now.
 - had*
 - has
 - is having*
- A: Do you know this music?
B: Yes. I () it.
 - knew*
 - am knowing*
 - know
- My classmates () a *hanami* party near my house, and they are singing songs. So, I cannot read a book quietly.
 - have*
 - are having
 - had*
- My home town is in Iwate, but I () in Tokyo now because my company is there.
 - live
 - am living
 - lived*
- "Strong" () *tsuyoi* in Japanese.
 - is usually meaning*
 - usually means
 - usually meant
- Aki and I go to school together. So, I () in front of her house now.
 - stood*
 - stand
 - am standing
- My sister () at dogs. Why? We see dogs every day.
 - looks at*
 - will look at*
 - is looking at
- I'm happy because she () fun now. Don't disturb her.
 - had*
 - is having
 - will be having*
- I () you tomorrow.
 - saw*
 - see
 - am seeing
- She () in the town last year.
 - lives*
 - is living*
 - lived
- Aki: Ken, let's play in the park!
Ken: Sorry, Aki. I () lunch now.
 - am having
 - have*
 - had*



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Nakayama: *Do EFL Textbooks in Japan Cause Lexical Priming?*

13. My teacher is usually strict with me, but today, he () to me.
a) will be kind* b) is being kind c) is kind
14. Yesterday, I () the dog.
a) saw b) am seeing* c) see*
15. A: Please tell me the answer to the question. I need the answer now.
B: Just a minute! I () about it.
a) will be thinking* b) am thinking c) thought*
16. I didn't have breakfast today. So, I () hungry now.
a) am b) am being* c) was*
17. A: Do you have a pet?
B: Yes, I () pets.
a) have b) am having* c) had*

Note. *Incorrect response

The underlined expressions had their meanings in Japanese added.