Linguistics Instruction for Japanese Junior High School Students

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There have been some attempts to teach linguistics to elementary and junior high school (JHS) students. However, little has been empirically investigated about how such teaching influences these students. This study aimed to investigate the effects of linguistics instruction on the language learning of 22 Japanese JHS students. Participants attended linguistics classes that dealt with syntactic and morphological rules in Japanese and English. Four variables were measured: metalinguistic ability, self-efficacy in language learning, beliefs about language learning, and language attitudes. Participants answered preinstruction questionnaires to evaluate their self-efficacy, beliefs, and language attitudes and took pre- and posttests of metalinguistic ability. Two months after the last class, delayed questionnaires were completed. The results revealed that post test metalinguistic ability scores were significantly higher than pretest scores. Also, positive responses regarding language attitudes showed a significant increase. These findings suggest that linguistics instruction can have a positive effect on language learning.

これまでに小・中学生に言語学を教える試みはいくつかあるものの、それがどのような効果をもたらすのかということについて実証的に検討した研究はほとんどない。そこで、本研究は言語学の指導が中学生の言語学習に与える影響を明らかにする。調査参加者は22人の日本人中学生であった。参加者は日本語、および英語の基礎的な統語論・形態論を扱う4回の授業に参加した。測定された変数はメタ言語能力、自己効力感、言語学習に対する信念、言語に対する態度であった。メタ言語能力に関しては指導の事前と事後にテストが実施され、他の変数に関しては事前の測定に加え、最後の授業の2ヶ月後に遅延の測定が行われた。分析の結果、メタ言語能力は事前に比べて事後の方が有意にスコアが高く、言語に対する態度のスコアについても有意な上昇が見られた。これらの結果から言語学の指導は言語学習に対してポジティブな効果をもたらすということが示唆される。

It is reasonable to expect that language learners might benefit from learning linguistic theory. However, it is rare for language teachers to directly teach linguistics in class. As Denham and Lobeck (2010) pointed out, "The advances of linguistic science have remained largely confined to the academy" (p. 1), namely, the university level only. Nevertheless, it is possible that explicit knowledge of how language itself functions could arouse learners' interest in language and enhance their motivation in language learning. Also, linguistic knowledge can develop in learners the analytical skills required to acquire a rich vocabulary and sophisticated level of literacy.

This paper presents the results of a research project that was aimed at testing some of the advantages of teaching linguistic theory to language learners and providing an example of teaching methods. The study involved having Japanese junior high school (JHS) students attend elementary linguistics classes. I compared their scores before and after instruction on a metalinguistic ability test and delayed scores on other measures of variables involving language learning. The results indicate there were positive effects of instruction on both cognitive and affective variables, and suggest that linguistics instruction is useful in language education. The next section introduces the background of the study. The preliminary study and the main study are then described, and general discussion is provided. The paper concludes with educational implications.

Literature Review

Increasing numbers of linguists and educators are making attempts to expose young students to linguistic theory in countries such as the UK, the USA, and Australia (e.g., Denham & Lobeck, 2005, 2010; Mulder, 2007). Although little effort along these lines has been made outside of English-speaking countries so far, several Japanese linguists and educators have worked on integrating linguistic theory with language teaching. Perhaps the most noteworthy example is Otsu's (1999) work. He implemented Japanese linguistics classes for elementary school children so as to develop their language awareness.

Another example is reported by Akita, et al. (2013). In their study, high school students participated in linguistics classes that were aimed at effectively linking Japanese language education with English language education. Results of these efforts have suggested that students showed stronger interest in the nature and functions of language and better language performance after the classes.

However, most previous work has been confined to practical reports. Few attempts have been made to empirically verify the impact of linguistics education on young adults' language learning, and there remain a variety of individual variables that earlier studies have not considered. In order to provide a persuasive account of the advantages of linguistics education for younger language learners, there is a need to empirically explore how cognitive and affective factors change as students obtain linguistic knowledge. In this regard, four variables were considered in this study: metalinguistic ability (MA), self-efficacy in language learning, beliefs about language learning, and language attitudes.

MA can generally be defined as the ability to reflect upon language itself as an object of thought in contrast to simply comprehending or producing it. According to several previous studies (e.g., Golonka, 2006; Lasagabaster, 2001; Zipke, 2007), MA is a significant cognitive factor in predicting success not only in L1 performance but also in foreign language learning and second language acquisition.

Self-efficacy is an affective variable that forms an important component of motivation, which itself has been extensively investigated as "a judgment of capability to execute given types of performances" (Bandura, 2006, p. 309). There is strong evidence that motivation is crucial to learning any subject. Indeed, numerous studies have shown the importance of motivation in language learning (e.g., Dörnyei, 1994, 2010; Ushioda, 2011).

Beliefs about language learning have to do with factors such as motivation and strategy use in L1 and foreign language learning. Based on Uesaka, Seo, and Ichikawa (2009), learner beliefs are defined herein as the learning methods a learner believes are effective. Horino and Ichikawa (1997), Nakayama (2005), and other researchers have proposed that these beliefs are a contributory factor in the selection of learning strategies and the facilitation of achievement.

Finally, language attitudes are also important because they share some aspects of the two variables mentioned above: motivation and beliefs. That is, attitudes include willingness to learn languages and perception of the utility of language learning. Here I define language attitudes as beliefs regarding the practical utility of knowledge about language as well as beliefs derived from an interest in language itself, as opposed to a desire for scholastic achievement.

Preliminary Study

The preliminary study aimed to develop a scale to measure language beliefs and attitudes. There were few existing instruments for measuring beliefs and language attitudes. Hence, these scales needed to be developed and piloted.

Method

Participants were 118 first-year students at a private girls' junior high school in the Kanto region of Japan. All were native Japanese speakers. The questionnaire consisted of 23 five-point Likert-scale items for beliefs, 20 items for language attitudes, and 8 items for self-efficacy. The beliefs items, from a scale with a focus on mathematics learning by Seo (2007) were adapted for second language learning. The language attitude items were developed to focus on respondents' interest in language itself and perceived utility of language learning. Self-efficacy was measured for the correlation analysis using an existing scale (Mori, 2004).

Analysis

The SPSS 22 software package was used for all analyses. Exploratory factor analysis was conducted both for the language-learning beliefs scale and the language attitude scale by using the maximum-likelihood method. Judging from the decline in eigenvalues and interpretability, a number of factors were identified. Items that had high loadings on multiple factors were excluded, and items with factor loadings less than .30 were also excluded. Any correlations among self-efficacy, beliefs, and attitudes were explored using factor analysis.

Results

Scale for Beliefs About Language Learning

As shown in Table 1, three factors of beliefs about language learning were identified (the decline in eigenvalues: 5.249, 3.064, 1.883, 1.456, 1.311. . .). These were designated rote memorization and outward results orientation (RO), strategy-use and failure-utilization orientation (SF), and environment-setting orientation (ES). SF is a cognitive belief, but the others are noncognitive. Cronbach's alpha coefficients for three subscales (Factors 1, 2, and 3) were sufficiently high (see Table 1). Also, previous studies corroborated these factors (Seo, 2007; Uesaka et al., 2009).

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Table 1. Loadings for Exploratory Factor Analysis With Promax Rotation of Beliefs About Language Learning

Items	F1 (α = .76)	F2 (α = .74)	F3 (α = .61)
23. I regard the score I get as more important than how much I understand.	**.743**	.095	.268
22. Taking examinations, whether my answer is correct or not, is more important than how to solve the problems.	**.602**	.055	.079
16. All I have to do for English examinations in reading and writing is to rote-memorize English grammar and phrases.	**.597**	.083	-.027
18. It is OK that I can make a correct answer even if I don't understand why it is correct.	**.576**	-.237	.107
3. If I memorize perfectly, I can say that I understand.	**.513**	.028	.014
10. It is important to memorize what I learn first before thinking how it could be.	**.480**	.048	-.112
2. The way of thinking does not matter to me as long as my answer is correct.	**.473**	-.211	-.296
13. Good grades depend on the amount of learning rather than the way of studying.	**.409**	.099	.015
20. I realize my weaknesses when I am unable to solve a problem.	.188	**.779**	-.091
17. I regard mistakes as important resources to utilize for future learning.	-.001	**.708**	-.187
15. I would like to know others' methods of solving besides my method.	.091	**.595**	.080
1. When I get poor grades, it is good to think about why I get them.	.009	**.532**	.017

Items	F1 (α = .76)	F2 (α = .74)	F3 (α = .61)
21. It is more effective to compare English with Japanese while studying English.	-.020	**.504**	.064
8. In order to get better grades, a teacher whose instruction is easy to understand is necessary.	.006	-.079	**.933**
4. If a teacher who is good at teaching teaches me, my grades will be better.	.150	.006	**.565**
19. In English classes, it is more effective to be taught in English than in Japanese.	-.261	.282	**.379**
Inter-factor correlations F1	-	-.379	.168
F2		-	.085

Scale for Language Attitudes

Three language attitude factors were identified (the decline of eigenvalue: 5.292, 1.954, 1.710, 1.255, 1.181. . .) as Table 2 shows. These were designated perceived utility of language learning (PU), curiosity about Japanese language (CJ), and curiosity about English language (CE). Perceived utility refers to the attitude of considering knowledge about language structures and functions practical and useful. Curiosity about Japanese and curiosity about English refer to the degree of interest in each language. Each factor had a satisfactory reliability coefficient (see Table 2).

Table 2. Loadings for Exploratory Factor Analysis With Promax Rotation of Language Attitudes

Items	F1 (α = .76)	F2 (α = .76)	F3 (α = .79)
1. Studying Japanese grammar is practical only for school tests and entrance exams.	**-.859**	-.091	.241
15. Knowledge about the structures of Japanese sentences and phrases is practical for daily life.	**.577**	.074	.012

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Items	F1 (α = .76)	F2 (α = .76)	F3 (α = .79)
13. Knowledge about the structures of Japanese sentences and phrases is practical for studying English.	**.545**	.040	.092
3. Studying Japanese grammar is boring.	**-.515**	-.175	-.045
18. Learning English or other languages can make my understanding about Japanese deepen.	**.418**	.018	.110
7. It is fun to think about structures and meanings of Japanese sentences and phrases.	.002	**.981**	-.046
8. I would like to know more about structures and meanings of Japanese sentences and phrases.	.065	**.802**	.121
17. I get conscious about and talk about structures and meanings of Japanese language expressions (e.g., advertisements, signs, and words printed in T-shirts) even while studying Japanese.	.161	**.384**	-.022
10. I would like to know more about the structures and meanings of English sentences and phrases.	-.019	.118	**.829**
9. It is fun to think about the structures and meanings of English sentences and phrases.	-.080	.219	**.728**
6. I like to study English grammar.	.072	-.138	**.633**
Inter-factor correlations F1	-	.277	.323
F2		-	.384

Correlation Analysis

Table 3 shows correlations among the factors. Noteworthy results were the correlations between PU and the other factors. Perceived utility had significant positive correlations with self-efficacy, SF, CJ, and CE. In contrast, PU had a significant negative correlation with RO.

Table 3. Correlation Coefficients Among the Variables (*p < .05, N = 118)

Factors	RO	SF	ES	PU	CJ	CE
Self-efficacy	.236	.105	.314*	.265*	-.035	.439*
RO	-	-.236*	.085	-.279*	-.067	.028
SF		-	.127	.401*	.079	.171
ES			-	.017	-.084	.104
PU				-	.359*	.340*
CJ					-	.398*

Note. RO = outward results orientation; SF = strategy-use and failure-utilization orientation; ES = environment-setting orientation; PU = perceived utility of language learning; CJ = curiosity about Japanese language; CE = curiosity about English language.

In sum, the preliminary study showed that beliefs about language learning and language attitudes can each be classified into three factors. The preliminary study also showed correlations among these factors and self-efficacy. In particular, it was noted that PU was significantly correlated with almost all the other factors.

In the main study, the data of these six factors and self-efficacy were used as preinstruction data for comparison between preinstruction and delayed questionnaires.

Main Study
Method

Twenty-two students who participated in the preliminary study took part in the main study, which consists of pre- and posttests to measure MA as well as a delayed questionnaire to measure beliefs and language attitudes. Participants were self-selected volunteers who took pre- and posttests to measure MA. The results of the preliminary study were used as preinstruction data on self-efficacy, beliefs, and attitudes. After the preliminary study, participants attended linguistics classes dealing with syntactic and morphological rules of Japanese and English (50 minutes each on 4 separate days). Then, two months after the last class, participants completed a delayed questionnaire that consisted of the same items as the preinstruction questionnaire.

Metalinguistic Ability Test

The metalinguistic ability (MA) test consisted of six ambiguity detection tasks and six grammatical relation perception tasks (see Appendix), and the maximum score was 12 points. The time limit for the test was 10 minutes. These 12 tasks were selected based on previous work (Igarashi, 2014). Ambiguity consisted of three types: surface structure, deep structure, and scope ambiguity. In this section, participants were asked to provide two meanings for each of the sentences, which were ambiguous depending on the context. Grammatical relation also consisted of 3 types: subject, object, and modification relation. In this section, participants were asked to find a word or phrase in the target sentence whose grammatical relation was the same as the underlined parts of the key sentence.

Scale of Self-Efficacy

The version of the self-efficacy scale translated into Japanese by Mori (2004) was adopted in this survey, though the scale itself originated from that of Pintrich and de Groot (1990). I excluded one item from Mori's version because it seemed too abstract for the participants to answer.

Content of Instruction and Procedures

Two examples of the topics dealt with during the classes are shown here. The first topic is abstract syntactic structure. The phrase *kowai me no obake* has different meanings according to context (Otsu & Kubozono, 2008). This ambiguity involves abstract syntactic structure, as Figure 1 and 2 suggest. Figure 1 shows one structure, where *kowai* (scary) modifies only *me* (eye). Figure 2 shows the other structure, where *kowai* (scary) directly modifies *obake* (monster). In this way, the instructor taught students different ways of interpreting the phrase using abstract syntactic structures. Also, the instructor discussed language acquisition, including the ability of native speakers to identify structures like these without explicit teaching.
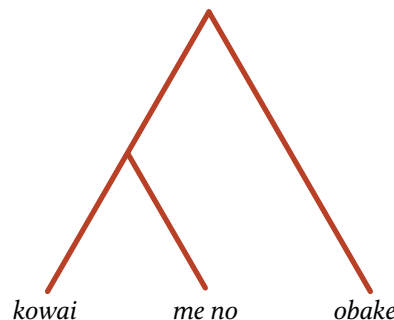

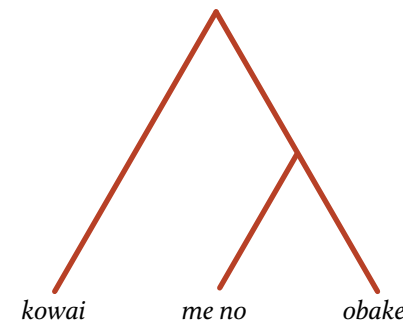| *kowai* | *me no* | *obake* | | *kowai* | *me no* | *obake* |

Figure 1. [[kowai me no] obake]   *Figure 2.* [kowai [me no obake]]

A further example involves compound words. Consider these English phrases: *greenhouse* and *green house*. The former has a meaning that is distinct from the latter. If they are written, the difference between the two is apparent. However, there is also a crucial phonological change in the form of a difference in stress between greenhouse [gríːnhaus] and green house [grìːn háus]. Moreover, consider these Japanese phrases: *akagami* and *akai kami*. Both *aka* and *akai* mean *red*, and there is no semantic difference between the two. On the other hand, there is a semantic difference between *akagami* and *akai kami*. The latter simply means red-colored paper, but the former means a draft card used by the Japanese army, which was printed on red paper. A phonological rule functions here as well. *Kami* (paper) cannot be pronounced [gami] if it is produced as a separate word. However, in the case of the compound *akagami* (red paper), [kami] changes to [gami]. This rule is known as *rendaku*, whereby an initial consonant of the second part of a compound word becomes voiced (Ito & Mester, 1996). The students were taught that in both languages phonological differences implied semantic differences, though the two languages appear to be considerably different from each other.

In treating each topic, including those mentioned above, the instructor placed importance on students' awareness. Hence, the instructor presented specific linguistic phenomena in Japanese first, then allowed time for students to reflect upon them. Also, the students were given time to discuss the phenomena in small groups so that they could become aware of the rule. After fully understanding a phenomenon in Japanese, the students compared Japanese with English regarding the phenomenon and received an explanation about relevant linguistic theories.

Analyses

I conducted two analyses of the pretest data: a correlation analysis and a paired *t* test (two-tailed). Correlations between MA and the other variables were investigated. Preinstruction questionnaire data were compared with postinstruction and delayed questionnaire data by means of paired *t* tests.

Results

Correlation Analysis

As Table 4 shows, MA significantly correlated positively with three variables: self-efficacy, CJ, and CE.

Table 4. Correlations between MA and the Other Variables (*p < .05, N = 22)

	Self-efficacy	RO	SF	ES	PU	CJ	CE
MA	.446*	.139	.047	.415	.176	.429*	.559*

Note. MA = metalinguistic ability; RO = outward results orientation; SF = strategy-use and failure-utilization orientation; ES = environment-setting orientation; PU = perceived utility of language learning; CJ = curiosity about Japanese language; CE = curiosity about English language.

Comparisons between Pre-, Post- and Delayed Questionnaire Data

As Table 5 shows, posttest MA scores were significantly higher than pretest scores. Also, the participants' responses indicated significantly higher PU than before instruction (see Table 6). On the other hand, there were no significant differences in the other variables, though it is likely that there was an effect for CJ and CE because of relatively low *p* values. Also Cohen's *d* values show that the possible effect was very small.

Table 5. Difference in Pre- and Posttest Scores for Metalinguistic Ability (N = 22)

Pretest		Posttest		t	p	Cohen's d
M	SD	M	SD			
3.82	2.13	7.05	2.57	6.34	.00	1.37

Table 6. Differences in Preinstruction and Delayed Scores for Affective Variables (N = 12)

Variable	Preinstruction		Delayed		t	p	Cohen's d
	M	SD	M	SD			
Self-efficacy	2.65	0.79	2.70	0.87	0.31	.77	0.06
RO	2.20	0.53	2.14	0.45	-0.22	.83	0.08
SF	4.08	0.55	4.16	0.57	0.27	.78	0.16
ES	3.07	0.66	3.17	0.48	0.45	.66	0.17
PU	3.51	0.73	3.92	0.54	2.85	.02	0.63
CJ	3.17	0.93	3.03	0.87	-0.83	.42	0.16
CE	2.97	0.96	3.17	0.87	1.21	.25	0.21

Note. RO = outward results orientation; SF = strategy-use and failure-utilization orientation; ES = environment-setting orientation; PU = perceived utility of language learning; CJ = curiosity about Japanese language; CE = curiosity about English language.

Discussion

Three findings were obtained from the main study and the preliminary study. First, according to the comparison of preinstruction, postinstruction, and delayed data, a positive effect of linguistics instruction was found for MA and PU. The first finding suggests that linguistics instruction for high school students may have enhanced both cognitive and affective factors of language learning: in this case metalinguistic ability and perceived utility respectively.

Second, the results of the correlation analysis revealed that MA significantly correlated with positive factors of language learning: self-efficacy, CJ, CE. The second finding suggests that increases in MA might have enhanced self-efficacy, CJ, and CE. Namely, it is likely that linguistics instruction indirectly enhanced self-efficacy, CJ, and CE through development of MA.

Lastly, the preliminary study showed that PU had a significant negative correlation with rote memorizing and RO. It also showed that PU had a significant positive correlation with self-efficacy, SF, CJ, and CE. Considering these correlations, the causal relationship between PU and the other factors is worth investigating through further research.

The present study suggests that linguistics instruction can enhance MA and PU. Also, the comparison of preinstruction data and delayed data showed that there might in fact have been a small effect on CJ and CE. Meanwhile, the study did not find an effect for self-efficacy, RO, and SF. Additionally, the study found correlations between MA, PU and the other factors, yet it did not investigate causal relationships among these factors. These issues await further investigation.

Conclusion

In this study I investigated the advantages of integrating linguistic theory and language teaching practice. The experiment was designed to introduce elementary linguistics to Japanese JHS students so that they could become more aware of language itself. Accordingly, they were taught similarities and differences between Japanese and English language on the basis of linguistic theory.

The study offers evidence of a possible contribution of linguistics to language teaching in secondary education, though advances in linguistic science have usually remained confined to academia. The findings suggest that linguistics instruction for JHS students was associated with positive changes in individual variables of language learning, in particular, metalinguistic ability and perceived utility of language learning.

Based on the findings and limitations of this study, possible directions for further research can be suggested. For example, a larger sample could have been used with a control group. Also, longitudinal studies incorporating qualitative data alongside quantitative data might yield a richer portrait of students' reactions. Further work in this area will hopefully reveal the usefulness of linguistic approaches to language instruction.

Bio Data

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Appendix
Examples of Metalinguistic Ability Tasks
Ambiguity Detection Tasks

Instructions:

The following sentences have two different meanings depending on the situation. Please explain the two possible meanings.

- 次の試合では二郎に勝ってほしい。[Deep]

  We want Jiro to win.

  We want Jiro to lose.

- 今日明日の予定を確定した。[Surface]

  We decided the schedule for today and tomorrow.

  Today, we decided the schedule for tomorrow.

- 今日の講義は十人も来なかった。[Scope]

  Ten students were absent.

  Fewer than ten students attended.

Grammatical Relation Perception Tasks (A: Key Sentence, B: Target Sentence)

Instructions:

Find a word or phrase in sentence B whose grammatical relation is the same as the underlined word or phrase in sentence A, and indicate it by using brackets.

- A: 物理に関しては湯川君に解けない問題はない。[Subject]

  [There are no problems Yukawa-kun can't solve when it comes to physics.]

  B: メアリーから(ジョンが)財産を協会に寄付したと聞いた。

  [(John) heard from Mary that she donated her property to the church.]

- A: スポーツカーが欲しい翔太は一生懸命働いた。[Object]

  [Shota worked hard so that he wanted a sports car.]

  B: 会場が朝から(漫画の)好きな人で溢れていた。

  [Since morning, the hall had been full of people who loved (manga).]

- A: ジェイムズからもらった手紙は私の一生の宝物になった。[Modification]

  [A letter that I have received from James has become my lifetime treasure.]

  B: 学校から呼び出されて(娘の)小学校に急いで行った。

  [I got called out to (my daughter's) elementary school and rushed there.]