

The Development and Validation of the Self-Regulated Learning in Listening Questionnaire

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Abstract

本研究の目的は、日本人大学生のリスニングにおける自己調整学習に関する重要な構成要素（メタ認知、自己効力感、方略）を測る質問紙を作成し、その信頼性と妥当性を検証することである。リスニングにおける自己調整学習を測る質問紙がないため自己調整学習質問紙（SRLQ, the Self-Regulated Learning in Listening Questionnaire）は作成された。その際は、オーラル・コミュニケーションにおける自己調整学習質問紙（Kobayashi, 2016a）を元に、リスニングの文脈に合うよう作成した。次の三つの段階を通して質問紙を作成した。第一段階では、先行文献調査、予備調査を行い、質問紙の項目を精選した。第二段階では、関西圏の大学に通う2, 3年生（124名）を対象に探索的因子分析を行い、質問紙の因子数や信頼性を調べた（調査1）。最終段階では、調査1の参加者と同じ大学に通う2, 3年生（185名）を対象に構造方程式モデリング（SEM, Structural Equation Modeling）を用いて質問紙の妥当性を検討した（調査2）。結果、作成された質問紙には信頼性と妥当性があることが示された。探索的因子分析の結果、尺度は6因子で構成されていることが分かった。また、尺度全体の信頼性、及び下位尺度に関しても十分な値が得られた（ $\alpha = .75-.94$ ）。SEMの結果、モデルとデータとの適合度は良好であることが分かった。さらに、メタ認知は自己効力感と方略使用に影響するということが明らかになり、メタ認知指導の大切さを確かなものにする結果となった。

Keywords: Self-regulated learning, Metacognition, Self-efficacy, Strategy use, Listening

Introduction

English has become the global language, so it is important to acquire English as a means of communication (Crystal, 2003). Although the ability to read and write English is important, the ability to comprehend and speak it is also crucial to

understanding one another. However, Japanese learners of English as foreign language (EFL) learners find it very challenging to improve their ability to comprehend and speak English because there are very few opportunities for them to use English outside the classroom (as they are learning English in the environment of EFL). Given such a learning environment, it is essential to improve the quality of learning and increase the amount of the time spent on learning English outside the classroom since the time spent on studying English inside the classroom is limited. In such an environment, it is important to promote learner autonomy so that they can learn more effectively and efficiently and can improve their English ability while learning English even in an EFL environment (Kobayashi, 2012, 2014, 2016b).

Autonomous learners evaluate their strengths and weaknesses as learners and set goals. They plan and act to achieve their goals. They monitor their own learning and regulate it to achieve their goals (Holec, 1979). Autonomous learners are metacognitively aware learners (Ozeki, 2006). In general, metacognition is composed of two components: metacognitive knowledge and metacognitive skills (Flavell, 1979; Goh, 2008). Metacognitive knowledge contains knowledge about learners (e.g., their strengths and weaknesses), knowledge of goals and nature of the tasks, and knowledge about strategies (e.g., what they are, how they are used, and when and why). Metacognitive skills include skills such as planning, monitoring, and evaluating (Goh, 2008). Since metacognition contains both knowledge about and regulation of cognition, it is a crucial component when learners need to self-regulate their own learning. For instance, they set goals by evaluating their weaknesses, plan their learning activities, materials, pace, and space. They are also aware about how and why they behave a certain way. They execute their plans in order to achieve their goals, monitor, and reflect on their learning (Sinclair, 2008). In educational psychology, such process where learners actively participate in their own learning process metacognitively, motivationally, and behaviorally, is called 'self-regulated learning' (Zimmerman, 1986, 2008). Self-regulated learners are those who possess the capacity to control their metacognition, motivation, and behavior and actively participate in their own learning by setting, monitoring, evaluating, and acting to achieve their goals (Schraw, Crippen, & Hartley, 2006). Autonomous learners and self-regulated learners are similar in that they both have goals, which can be socially constructed and self-regulated (Kobayashi, in preparation).

Autonomy is executed when learners evaluate themselves critically and set

goals, which they monitor, evaluate, and try to achieve. Metacognition enables learners to evaluate themselves, set goals, monitor, and reflect on their learning. Therefore, without metacognition, both autonomous learners and self-regulated learners do not exist (Gao & Zhang, 2011; Ozeki, 2006). Consequently, to promote learner autonomy or to encourage self-regulation in learners, it is important to stimulate their metacognition (Takeuchi, 2010).

Kobayashi's (2016a) literature review on metacognitive instruction in Second Language Acquisition (SLA), focusing on oral communication and listening displayed the following: (1) learning strategy use (including metacognitive strategies) influences achievement and self-efficacy (Graham & Macaro, 2008); (2) metacognitive instruction has a positive effect on listening comprehension (Cross, 2011; Goh & Taib, 2006; Vandergrift & Tafaghodtari, 2010); (3) metacognitive knowledge affects achievement (Goh, 2008); and (4) learners who receive metacognitive instruction become aware of the importance of communication strategies and increase their ability to interact (Nakatani, 2005).

Recent studies conducted by Kobayashi (2012, 2014) have shown the impact of metacognitive instruction on EFL learners in oral communication. The researcher discovered that in oral communication, metacognition influences self-efficacy and strategy use. Furthermore, Kobayashi (2016b) evaluated a metacognitive instruction model that was implemented with students of English. Using structural equation modeling (SEM) and interview data, she investigated the effects of metacognitive instruction on students' metacognition, self-efficacy, interaction strategies, and oral communication skills. The author concludes that metacognitive knowledge (e.g., their awareness of why interactional competence is important, how they can improve such competence in the learning context, and strategy knowledge) can be enhanced through intervention, which leads to more effective interaction strategies and skills.

From the above literature review, it can be hypothesized that metacognitive instruction affects self-efficacy and achievement in listening (comprehension) as well. Listening skills are important in oral communication. However, as mentioned earlier, students who study English in an EFL environment, especially those who take English courses as required subjects, display their lack of understanding of the purpose for learning English (Sampson, 2016; Yashima, 2000). Therefore, it would be important to activate their metacognition through metacognitive instruction. Additionally, they need to understand how listening works as well. However, there is no valid and reliable measurement to assess the effect of

metacognitive instruction on listening. Without it, we cannot examine the effectiveness of the metacognitive instruction on listening nor can we reveal the relationships between the factors of Self-Regulated Learning (SRL) in listening.

Purposes

In order to perceive the effect of metacognitive instruction on listening and to unveil the relationships between the factors of SRL in listening, a measurement needs to be developed first. Therefore, this paper aims to develop a questionnaire to assess the effect of metacognitive instruction on listening and to reveal the relationships between the factors of SRL in listening, by modifying the instrument that Kobayashi (2016a) developed for oral communication. The Self-Regulated Learning Questionnaire (SRLQ) in Oral Communication (OC) was the measurement used to assess students' metacognition, self-efficacy, strategic behavior, and interaction strategies (Kobayashi, 2016a).

To accomplish the goals of the current study described above, two experiments, Study 1 and Study 2, were conducted. In Study 1, first an item pool was developed and the first version of the instrument was piloted. Then, an exploratory factor analysis (EFA) was conducted to reveal factors of the questionnaire. Then, an internal consistency reliability analysis was conducted to determine the reliability of the instrument. In Study 2, SEM was employed to assess if the hypothesized model would fit to the observed data, using the software AMOS 23.0. In the following section, because the existent instrument (Kobayashi, 2016a) does not contain listening strategies, literature review on listening strategies were focused on to add items into the item pool.

Literature review on listening strategies

A review of listening strategies, focusing on success of metacognitive instruction in listening comprehension in SLA has shown that the following listening strategies are effective: predicting, in which learners guess what kind of passage they are going to listen to before they listen (Goh, 1998); monitoring (their understanding) or checking their comprehension (e.g., Goh, 2002; Macaro, Graham & Vanderplank, 2007; Vandergrift, 2003); questioning for elaboration and translation (Vandergrift, 2003); and guessing unknown words from various hints (Goh, 2002). Therefore, these above listening strategies such as predicting, monitoring, and guessing are added into the item pool for the questionnaire.

Because listening strategies of the previous literature (e.g., Goh, 1998, 2002) are strategies used in ESL (English as the second language), it is not clear how effective they are for EFL learners. Therefore, in Study 1, the researcher investigated listening problems that EFL learners faced and obtained listening comprehension strategies which were perceived/had been perceived effective from the sample of a pilot study and added them to the item pool.

Study 1

Developing the item pool

A pilot study was conducted in October in 2015 to develop the item pool (Dörnyei & Taguchi, 2010). Listening strategies were elicited from students who were similar to the target sample so that the questionnaire items would be relevant to those students who had been studying in the EFL environment. The data were gathered from two TOEIC classes where the researcher was teaching. The English textbook that they were using was *Longman preparation series for the TOEIC® test (Intermediate course): Listening and reading* (Lougheed, 2012a). The aims of the course were the following. Students will:

- learn to become more autonomous learners;
- raise awareness as language learners and develop self-regulatory strategies regarding listening;
- become familiar with the format of the TOEIC exam;
- learn what kinds of questions regularly appear on the exams;
- become more comfortable and confident about taking the exam;
- improve their proficiency in the areas tested on these areas (listening, grammar, and reading) in every class, regularly take practice TOEIC tests;
- learn what kinds of mistakes students often make on the exams and how to avoid those mistakes;
- learn how to use their time efficiently and effectively;
- develop interpersonal relationships and acquire internationalism; and
- understand foreign cultures and diversity.

The participants were sophomores or juniors. They were all non-English majors who were taking a TOEIC class once a week as an elective compulsory course. Twenty six students from two classes completed an open-ended questionnaire

after answering listening comprehension questions. None of them had lived overseas more than six months. Some had obtained EIKEN Grade 2. Three students had learned English outside the classroom for more than eight years. Considering these three students' data might affect the result, I excluded them from the data analysis. Written informed consent was obtained from all the participants. The open-ended questionnaire was written in their mother tongue (i.e., Japanese):

1. *During* listening (when you listen and comprehend), is there anything you have/had trouble with? What are they? Please specify.
2. Is there anything you do/did to improve your listening comprehension in general? What are they? Why? Please specify.
3. *During* your listening class and *during* your listening tests, is there anything you do/did to improve your listening comprehension? What are they? Why? Please specify.
4. Reflecting on your listening class, are there any skills you have now that you did not have before the class started? What are they? Why do you think you gained these skills? Please specify.

Regarding the open-ended questionnaire above, the participants raised no questions. The participants expressed their problems:

- (1) Speakers speak too fast to comprehend (they cannot understand the content at all);
- (2) Pronunciation and liaison are unfamiliar; and
- (3) They cannot catch difficult words (and they get panic and unable to listen).

Although the last problem was mentioned in the previous literature (e.g., Goh, 2002), the first and the second ones were not mentioned in the previous literature. Then, some of the strategies reported by them were added to the item pool. They were strategies that the participants used to overcome their problems and were perceived effective. To measure learners' use of strategies psychometrically, all the items were carefully worded focusing on declaration or conditional aspects in the same manner conducted previously (Kobayashi, 2016a).

The questionnaire was prepared in participants' mother tongue (i.e., Japanese) so that participants could answer appropriately. The instrument was examined critically for the content (e.g., whether there are missing items or not) by an English language university instructor who is also a researcher in foreign language

teaching and teaching listening, resulting in further fine-tuning.

A 7-point Likert scale ranging from *very true of me* to *not at all true of me* was chosen because the previous study (Kobayashi, 2016a) used such a scale (see the Appendix for the final version of the Self-Regulated Learning in Listening Questionnaire, SRLQ items). An information cover page assured respondents that: (a) there were no right or wrong answers to any questions but forthright responses were important; (b) their responses would not affect their grades; (c) confidentiality would be respected; and (d) their response would be used for research purposes only. Written informed consent was obtained from all the participants. It took approximately 10 minutes for them to complete the questionnaire. All the data were collected in the classroom at the beginning of January and in July in 2016.

Participants

More than 180 university students participated in the study. They were sophomores or juniors whose age was either 19 or 20. They were sampled from TOEIC classes in a private university in the western part of Japan where the researcher had been working as an English instructor. The participants had a 90-minute TOEIC lesson once a week as an elective compulsory course. They had lessons by a Japanese English teacher. They were all non-English majors, studying English as a foreign language. Although not all the students had English proficiency scores, many students had EIKEN Grade Pre-2 or Grade 2. The English textbooks that they were using were either *Longman preparation series for the TOEIC® test* (Lougheed, 2012a) or *Longman preparation series for the TOEIC® test: More practice tests* (Lougheed, 2012b). The textbooks they used were for improving students' proficiency in English and their test-taking skills for those students who aim to achieve TOEIC test scores from 300 to 600. The textbook included a CD-Rom, which contained answer key, complete audio MP3 files, and audio script to help students practice listening comprehension exercises and listening practice test questions on their own. Listening comprehension exercises and practices provided reflected the format and content of the TOEIC test. Completing listening and reading exercises were their main activities, but students were also provided grammatical explanations as well as test-taking strategies.

Those learners' data were excluded from the sample: (a) learners who had lived

overseas more than 6 months; (b) learners who obtained higher English proficiency than others; (c) learners who had taken English conversation lessons outside the classroom for more than 6 years; (d) those data which contained missing information or missing values; or (e) they were English majors. Accordingly, 124 students' data (male: 70, female: 54) were used for further analysis.

Results

Exploratory factor analysis (EFA). The first version of the SROLLQ was investigated by means of EFA, using the software SPSS 23.0 to reveal factors and to identify any items that might be removed from the questionnaire. After confirming that all the questionnaire items did not show a ceiling or floor effect, the maximum likelihood extraction method with Promax rotation with Kaiser Normalization was conducted on the 30 items of the SROLLQ to estimate the maximum number of factors. An initial estimate of the number of factors was determined, evaluating a scree plot, evaluating discontinuity in variance, and following Kaiser's criterion (i.e., selecting factors with eigenvalues greater than one). A six-factor solution met the goals of interpretability and was comprehensible. These items were deleted: (a) items that are considered ultra-Heywood cases (a communality exceeds 1); (b) items with low loadings (below 3.5); or (c) items that are similar in terms of the content. Accordingly, six items were deleted. Using an interactive process, several subsequent maximum likelihood extraction methods with Promax rotation were conducted. This led to the eventual retention of 24 items.

All of the six emerging factors were clearly identifiable and matched up with results reported by Kobayashi (2016a). Factor 1 consisted of three items which measured students' self-efficacy in the listening class. Therefore, it was labeled "Self-efficacy". Factor 2 was related to metacognitive activities such as planning, monitoring, evaluation, and accordingly, it was labeled "Regulation of Cognition". Factor 3 measured the awareness of metacognitive knowledge and metacognitive activities. Therefore, it was labeled "Awareness of Metacognition". Factor 4 measured the use of cognitive strategies. Therefore, it was labeled "Cognitive Strategies". Factor 5 consisted of 5 items which all measured use of listening strategies. It was labeled "Listening Strategies". Factor 6 was related to metacognitive knowledge such as knowledge of one's cognition, knowledge of

how to use the strategy, and knowledge of why and when to use the strategy and therefore it was labeled “Knowledge of Cognition”. Cronbach’s alpha of all the items as a whole was .93. The individual scale coefficients are above .80 except for Listening Strategies (= .79), which is close to .80, which indicates that the scales performed well in terms of reliability (see Table 1).

Table 1
The Internal Consistency Reliability of the Six Factors

	Factors	α
1	Self-efficacy	.91
2	Regulation of Cognition	.90
3	Awareness of Metacognition	.86
4	Cognitive Strategies	.83
5	Listening Strategies	.79
6	Knowledge of Cognition	.81

Discussion

Theoretically, SRL is composed of these three main components: metacognition, motivation, and strategy use. As mentioned earlier, the results of EFAs showed that the questionnaire contains six factors, which is compatible with the previous study’s result (Kobayashi, 2016a): Three of the factors were related to metacognition (i.e., Knowledge of Cognition, Regulation of Cognition, and Awareness of Metacognition), one of the factors was related to motivation (i.e., Self-efficacy), and two of them were related to strategy use (i.e., Cognitive Strategies and Listening Strategies). Thus, the results were in line with those of the previous study and again suggested that the developed questionnaire was composed of the important factors of SRL in the listening class and that it had high reliability. However, because an EFA does not allow us to examine causal relationships between variables and reveal relationships of subcomponents of SRL, in Study 2, we verify the validity of the questionnaire, using SEM.

Study 2

Purposes

In SEM, first, the construct of the latent variables and their paths are hypothesized. Based on theoretical consideration (e.g., Schraw, et al., 2006; Vandergrift, Goh, Mareschal, & Tafaghodtari, 2006), there are three possible models: (a) the hypothesized model (see Figure 1); (b) a self-efficacy higher-order

model; and (c) a strategic behavior higher-order model. The best model is chosen by considering results of Akaike's Information Criterion (AIC) and comparing fit indices. Small values of AIC indicate good fitting (Tabei, 2011). After choosing the best model, the model is evaluated whether it would be mirrored or confirmed by the six variables obtained through EFAs. Then, the extent to which the hypothesized construct would fit with the data is examined, using fit indices (Tabei, 2011). SEM also allows us to examine causal relations between the variables as well. Consequently, in Study 2 the extent to which the hypothesized model (driven by theory) would fit with the data is evaluated and relations between variables would be investigated.

Participants

Participants of the second study were more than 210 Japanese students. All the data were collected at the end of July, in October and November in 2016 in their classrooms in the same manner as the first study was conducted. The questionnaire was written in the participants' mother tongue (i.e., Japanese). The sample was obtained from the same university of the first target sample. They were chosen because they represent the majority of Japanese university students in terms of English ability. 56% of the total sample was female. The participants in Study 2 and the participants in Study 1 shared the same characteristics: (a) the participants in Study 2 were also sophomores (89%) and juniors (11%); (b) they were also non-English majors; (c) materials they were using in TOEIC classes were also *Longman preparation series for the TOEIC® test* (Lougheed, 2012a), *Longman preparation series for the TOEIC® test: More practice test* (Lougheed, 2012b); or *Complete guide to the TOEIC® test* (Rogers, 2006); and (d) their English proficiency was considered to be Basic Users from the level of textbooks and casual interviews the instructor had with students' teachers. Some of the data were excluded from the target sample in the exactly same way as some data of the first sample were excluded so that findings of this study could be generalized to similar populations in similar contexts. After excluding some, 185 data from the sample group were used for the analysis.

The Hypothesized Model

Figure 1 below illustrates a hypothesized model of the relationship among metacognition, self-efficacy, and strategy use in listening in TOEIC classes.

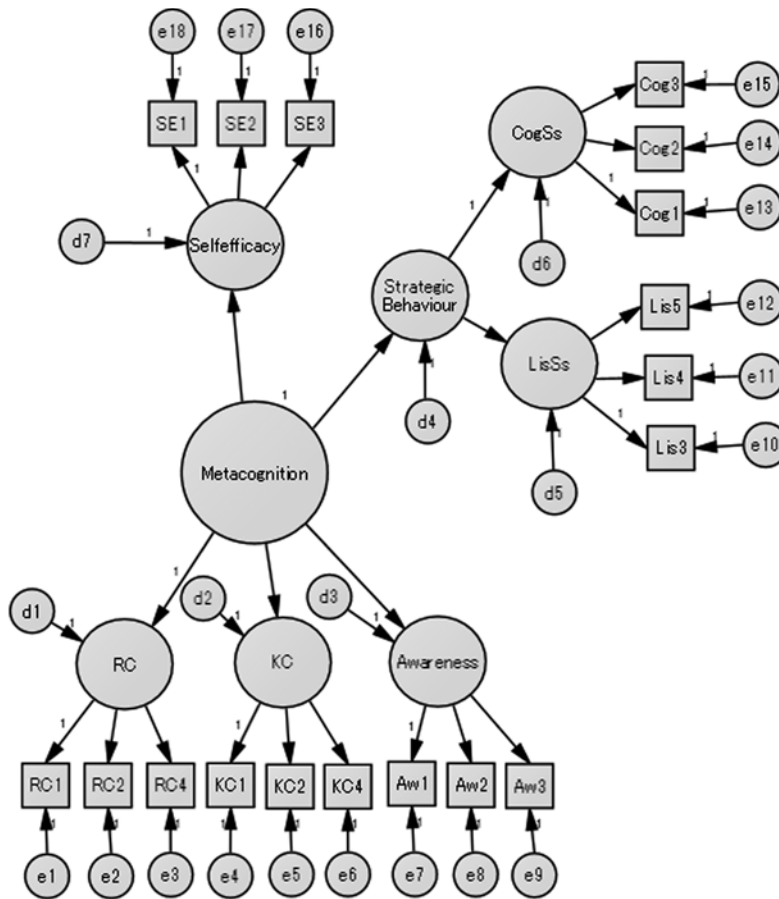


Figure 1. Hypothesized model.

RC = Regulation of Cognition; KC = Knowledge of Cognition; Awareness = Awareness of Metacognition; CogSs = Cognitive Strategies; LisSs = Listening Strategies.

As shown in Figure 1, the model was composed of three main latent variables (i.e., Metacognition, Strategic Behavior, and Self-efficacy). Based on theoretical considerations, previous study's results (Kobayashi, 2016a), and interpretability, Regulation of Cognition, Knowledge of Cognition, and Awareness were classified as Metacognition variables. Similarly, Cognitive Strategies and Listening Strategies were classified as Strategic Behavior on the basis of theoretical considerations. Strategic Behavior is strategies that L2 learners use to maximize their L2 linguistic knowledge resources (Macaro, 2010). Linguistic knowledge resources include these: (a) lexical-semantic knowledge; (b) phonological-graphological knowledge; (c) morpho-syntactic knowledge; and (d) pragmatic knowledge.

The hypothesized model in Figure 1 represents a metacognition higher-order

model, which means that the first-order factors and the second-order factors would be explained by some higher order structure which, in the case of the SRLQ, is a single third-order factor, metacognition. To test such a model, the model hypothesized a priori that: (a) two first-order factors (Cognitive Strategies, Listening Strategies) would be explained by a higher order structure, a single second factor of structure (Strategic Behavior); (b) this second-order factor (Strategic Behavior) as well as the other four second-order factors (Self-efficacy, Regulation of Cognition, Knowledge of Cognition, Awareness) would be explained fully by a higher-order structure, a single third factor structure (Metacognition); (c) error terms associated with each item would be uncorrelated; and (d) covariation among the five second-order factors would be explained fully by their regression on the third-order factor.

Therefore, if the hypothesized model in Figure 1 is valid, it would confirm the previous study's (Kobayashi, 2016a) finding which suggested that metacognition would be the most influential factor among those important subcomponents of SRL. Furthermore, results would confirm that all the second-order factors are correlated. As shown in Figure 1, for the identifiability of the hypothesized model, the regression coefficients from a factor to one of its indicators were all fixed to a value of 1 (Brown, 2006), the path from Strategic Behavior to Cognitive Strategies was also fixed to 1, and the variance of Metacognition was fixed to 1. Then, all the paths in the model were drawn on the basis of theoretical considerations.

Results

Unfortunately, fit index figures indicated that the model tested with the 24 items of the SRLQ did not fit the data as I had expected. Accordingly, the questionnaire items were reexamined carefully. I noticed that some of the items were rather too specific and overlapped. For instance, the item, "In order to improve my listening ability (skills), I read words and expressions aloud over and over again and memorize", was similar to the item, "In order to improve my listening ability (skills), I memorize English pronunciation". Thus, the questionnaire items were subjected to expert judgment for content validity (Dörnyei & Taguchi, 2010) and when similar items were found, those items that show broader concepts were left. Then, an EFA was conducted again, using the software SPSS 23.0 to reveal factors and to identify any items that might be removed from the revised version of the SRLQ. It was tested with a second sample of respondents, $N = 185$). After

confirming that all the questionnaire items did not show a ceiling or floor effect, the method of maximum likelihood estimation was conducted on the 22 items of the SRLQ to estimate the maximum number of factors. An initial estimate of the number of factors was determined, by evaluating a scree plot, evaluating discontinuity in variance, and following Kaiser's criterion (i.e., selecting factors with eigenvalues greater than one). Using an interactive process, several subsequent maximum likelihood extraction methods with Promax rotation were conducted. Items that show high loadings on more than one factor or similar items were carefully checked. This led to the eventual retention of 18 items. A six-factor solution met the goals of interpretability and was comprehensible.

Table 2 in the following page presents the six emerging factors, questionnaire items, and Cronbach's alpha internal consistency reliability coefficients of each individual scale. Cronbach's alpha of all the items as a whole was .91. All the scale coefficients were above .75, which indicates that the revised SRLQ can be used as a reliable research instrument (see Table 2). All of the six factors were the same as the factors obtained before and clearly identifiable.

After EFAs, the shorter, revised version of the SRLQ was submitted to a confirmatory factor analysis. SEM was employed based on data collected from the second sample, using the software AMOS 23.0 to assess whether the hypothesized model would fit to the observed data.

Table 2
Factor Loadings of the Self-Regulated Learning in Listening Questionnaire

Items		F1	F2	F3	F4	F5	F6
Self-efficacy ($\alpha = .94$)	SE3. I feel I can do well on assignments and tests in the listening class.	.949	.000	.004	.008	.036	-.027
	SE1. I feel I can obtain satisfactory grades in the listening class.	.861	-.015	.029	-.062	.009	.086
	SE2. I feel I can understand basic contents taught in the listening class.	.819	.034	-.065	.082	.027	.040
Awareness of Metacognition ($\alpha = .87$)	Aw2. With respect to listening learning, I think it important to know what learning strategies are most effective and when to use them effectively.	-.023	.853	-.036	-.011	.039	.056
	Aw3. During listening tasks, I think it important to monitor (check) how well I am listening to.	.063	.814	.069	.103	-.103	-.120
	Aw1. With respect to listening learning, I think it important to know my strengths and weaknesses as a learner.	-.024	.804	.009	-.071	.113	.065
Regulation of Cognition ($\alpha = .87$)	RC2. I try to ask myself regularly whether my learning progress serves goals I set for myself.	.031	-.025	.982	.128	-.143	-.073
	RC1. To improve my listening ability (skills), I try to set my own goals.	-.120	.137	.798	-.096	.049	.101
	RC4. After I finish the task in the OC class, I try to evaluate my performance.	.092	-.089	.646	-.019	.217	.019
Cognitive Ss ($\alpha = .75$)	Cog2. To improve my listening ability (skills), I read words and expressions aloud over and over again and memorize them.	-.087	.003	-.021	.824	.151	-.009
	Cog3. To improve my listening ability (skills), I write down what I listen to.	.005	-.046	-.002	.667	.099	.061
	Cog1. To improve my listening ability (skills), I listen to foreign music and English learning materials.	.114	.062	.075	.604	-.178	-.031
Listening Ss ($\alpha = .79$)	Lis4. While listening, I pay attention to a speaker's stress and intonation in order to comprehend well.	.012	-.036	.088	-.014	.795	-.009
	Lis3. While listening, I focus on a speaker's first few words in order to comprehend well.	.062	.041	-.010	-.068	.786	-.116
	Lis5. When listening, I comprehend better when I know something about the topic/theme on listening tasks.	-.023	.062	-.093	.249	.550	.075
Knowledge of Cognition ($\alpha = .85$)	KC2. With respect to listening, I have a clear goal when I use learning strategies.	.030	-.111	.064	.022	.016	.852
	KC1. With respect to listening, I can evaluate my own learning progress.	.120	.086	-.081	-.022	-.098	.804
	KC4. With respect to listening, I am aware of my strengths and weaknesses as a learner.	.060	.019	.126	.038	-.020	.595

Findings

Structural equation modeling. Results of Akaike's Information Criterion (AIC) of the other two models indicate that the hypothesized model was better than both the self-efficacy higher-order model and the strategic behavior higher-order model. The AIC value of the hypothesized model was the smallest (i.e., 303): The AIC values of the self-efficacy model and the strategic behavior model were 316 and 332 respectively. Therefore, the hypothesized model in Figure 1 was considered to be the best model among the three models. As shown in Table 3, five out of seven structural model fit indices indicate that the model fit the data reasonably well ($N = 185$) (Brown, 2006).

Table 3

Summary of the Evaluation of Measurement Model Fit

	CFI	GFI	AGFI	RMSEA	TLI	IFI	NFI	AIC
Standard	> .95	> .9	> .9	< .08	> .9	> .9	> .9	—
CFA model	.96	.89	.85	.06	.95	.96	.90	303

Note. CFI = Comparative fit index, GFI = Goodness of fit index, AGFI = Adjusted goodness of fit index, RMSEA = Root mean square error of approximation, TLI = Tucker-Lewis index, IFI = Incremental fit index, NFI = Normed fit index.

Results drawn from Figure 2 below showed that: (a) metacognition was composed of three latent variables, which were Regulation of Cognition, Knowledge of Cognition, and Awareness of Metacognition; (b) the path from Metacognition to Self-efficacy was significant; (c) the path from Metacognition to Strategic Behavior was also significant; and (d) covariation among the five second-order factors (i.e., Regulation of Cognition, Knowledge of Cognition, Awareness, Self-efficacy, and Strategic Behavior) were explained fully by their regression on the third-order factor (i.e., Metacognition).

The last result indicated that there is a correlation between Strategic Behavior and Self-efficacy. The results of correlational analyses, using SEM confirmed that Strategic Behavior and Self-efficacy were moderately correlated (i.e., .61) (Tabeni, 2011).

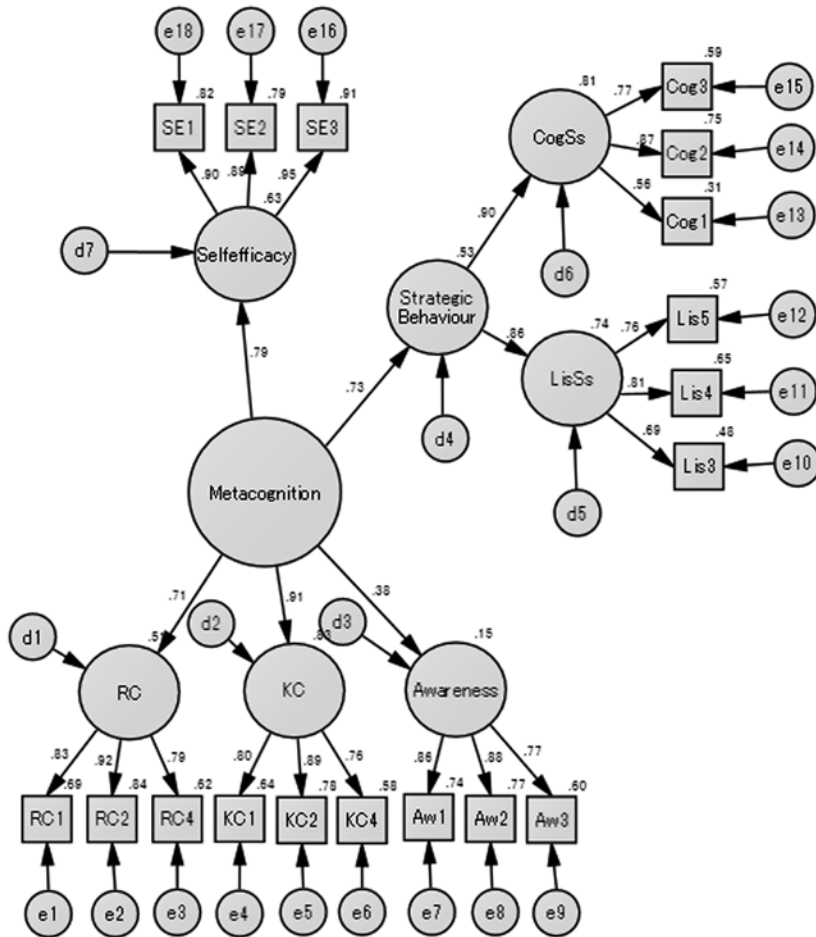


Figure 2. The results of the hypothesized model.

Path coefficients represent standardized estimates, $p < .001$, See *Figure 1.* for abbreviation.

Discussion

The results in Table 3 provided the evidence for the construct validity of the measurement. Two fit indices, the goodness of fit (GFI) and the adjusted goodness of fit index (AGFI), did not meet the acceptable fit threshold. Values for the GFI and AGFI range between 0 and 1. AGFI adjusts the GFI based upon degrees of freedom. Generally, a GFI value and an AGFI value close to .90 suggest good fit (Schumacker & Lomax, 1996). As can be seen in Table 3, the GFI here is not too far from .90 (i.e., .89) and the AGFI here is marginal (i.e., .85). Although the GFI did not meet the acceptable fit threshold, other four incremental fit indices (i.e., IFI, CFI, NFI, and TLI) and the root mean square error of approximation

(RMSEA) suggested that the hypothesized model was meaningful and appropriate and it had a good overall fit with the empirical data (Brown, 2006). Therefore, we can conclude that the hypothesized construct in Figure 2 is empirically valid.

Overall, results of the model seem to be in line with those reported by Kobayashi (2016a). The model presented here again suggested that those Japanese university students who value metacognition tend to use more learning strategies than those who undervalue. This finding also supports the discussion provided by the previous research that it is important to raise awareness of metacognition when metacognitive instruction is conducted so that they can use learning strategies more effectively.

With respect to relationships between latent variables, generally results here parallel those reported by Kobayashi (2016a). First, the result, that the path from metacognition to self-efficacy was significant, and the result, that the path from metacognition to strategic behavior was also significant, indicate two things: (a) metacognition can influence both self-efficacy and strategic behavior positively; and (b) those Japanese university students, who regard metacognition essential and are metacognitively active, are more likely to be self-efficacious, are more aware of their responsibilities in the listening class, and use more learning strategies. The result, that metacognition influences self-efficacy and strategic behavior positively, suggests that metacognition is an extremely important factor in SRL. These findings endorse previous research studies (e.g., Goh, 2008; Schraw, et al., 2006) which concluded that the role of metacognition is especially important.

This combination of findings is encouraging and further supports the existing literature, which suggests that activating learners' metacognition through metacognitive instruction can have a positive impact on self-efficacy and strategy use (e.g., Goh, 2008; Vandergrift, 2005). Moreover, the result, that the path from metacognition to strategic behavior was significant, further seems to support the idea that activated metacognition through metacognitive instruction can influence strategy use and then that influenced strategy use can affect achievement (e.g., Graham & Macaro, 2008; Kobayashi, 2016b; Nakatani, 2005; Vandergrift & Tafaghodtari, 2010).

Lastly, SEM analyses have shown a correlation between self-efficacy and strategic behavior. This result is also consistent with previous literature (e.g., Kobayashi, 2016a; Zimmerman & Martinez-Pons, 1990) which has suggested that when self-efficacy is affected positively, strategic behavior is also affected

positively.

Conclusion

The purpose of the present study was to develop a self-regulated learning questionnaire that assesses L2 learners' self-regulated learning in listening classes because there was no valid and reliable instrument that measures such capacity (skills). The SROLLQ was developed through two tests: In Study 1, developing the item pool and EFA; and in Study 2, SEM. Study 1 and Study 2 have described the development and validation of the SROLLQ and have demonstrated that the SROLLQ, which assesses L2 learners' metacognition, self-efficacy, and strategic behavior, is a reliable and valid instrument.

Through the results of SEM, relationships of important subcomponents of SRL have been revealed and verified: First, metacognition positively influences both strategy use and self-efficacy. This finding is consistent with the previous study's (Kobayashi, 2016a) result. The finding in this study has also suggested that those students who are more metacognitively active are more likely able to perceive themselves as being capable of dealing with a given task and are more active in the listening class by using more cognitive strategies and listening strategies than those students with less metacognitive awareness. This finding further has reinforced the previous study's finding that if metacognition is influenced positively by educational intervention, both self-efficacy and strategy use are also affected positively. Furthermore, the result, that there are correlations among the important subcomponents of SRL, has strengthened a previous research finding. Overall, the findings of this study have supported the notion that activating metacognition through metacognitive instruction in the listening class will play a key role in SRL.

The present study makes an important contribution to a growing body of literature on SRL and SLA by establishing a questionnaire which measures SRL in the listening class. With this instrument, we can examine the effectiveness of the instruction. In addition, the questionnaire has the potential to raise university students' awareness of their general listening skills, learning strategies, and themselves as language learners.

Finally, limitations need to be considered. First, the SROLLQ has not been externally validated: If we could demonstrate there is a relationship between behaviors reported in the SROLLQ and listening test scores, such correlational data

would enhance the validity of the questionnaire. Similarly, if we could provide learning outcome data with the developed questionnaire, we could increase the validity of the instrument as well. Accordingly, future research should include actual performance to examine the relationship in the listening class. Lastly, this study's findings may not be generalized to other groups such as more advanced English learners and English majors. Therefore, caution needs to be taken in an attempt to discuss and generalize the findings.

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Appendix

The Self-Regulated Learning in Listening Questionnaire (SRLQ) items (translated from Japanese into English)

Note. These are presented below each part (i.e., Part1–Part4) in the original questionnaire:

1 = (0–10%) 2 = (10–20%) 3 = (20–40%) 4 = (40–60%) 5 = (60–80%) 6 = (80–90%) 7 = (90–100%)

1 = (*Not at all true of me*)

7 = (*Very true of me*)

Part 1: Self-efficacy items

1.	I feel I can obtain satisfactory grades in the listening class.	1	2	3	4	5	6	7
2.	I feel I can understand basic contents taught in the listening class.	1	2	3	4	5	6	7
3.	I feel I can do well on assignments and tests in the listening class.	1	2	3	4	5	6	7

Part 2: Knowledge of Cognition items

1.	With respect to listening, I can evaluate my own learning progress.	1	2	3	4	5	6	7
2.	With respect to listening, I have a clear goal when I use learning strategies.	1	2	3	4	5	6	7
3.	When I study for listening, I am aware of what strategies I use.	1	2	3	4	5	6	7

Part 3: Awareness of Metacognition and Regulation of Cognition items

1.	With respect to listening learning, I think it important to know my strengths and weaknesses as a learner.	1	2	3	4	5	6	7
2.	With respect to listening learning, I think it important to know what learning strategies are most effective and when to use them effectively.	1	2	3	4	5	6	7
3.	During listening tasks, I think it important to monitor (check) how well I am listening to.	1	2	3	4	5	6	7
4.	To improve my listening ability (skills), I try to set my own goals.	1	2	3	4	5	6	7
5.	I try to ask myself regularly whether my learning progress serves goals I set for myself.	1	2	3	4	5	6	7
6.	After I finish the task in the listening class, I try to evaluate my performance.	1	2	3	4	5	6	7

Part 4: Strategic Behavior items

1.	To improve my listening ability (skills), I listen to foreign music and English learning materials.	1	2	3	4	5	6	7
2.	To improve my listening ability (skills), I read words and expressions aloud over and over again and memorize them.	1	2	3	4	5	6	7
3.	To improve my listening ability (skills), I write down what I hear.	1	2	3	4	5	6	7
4.	When listening, I pay attention to a speaker's stress and intonation in order to comprehend well.	1	2	3	4	5	6	7
5.	When listening, I focus on a speaker's first few words in order to comprehend well.	1	2	3	4	5	6	7
6.	When listening, I comprehend better when I know something about the topic/theme on listening tasks.	1	2	3	4	5	6	7