

## USING A MOBILE-ASSISTED LANGUAGE LEARNING APPLICATION TO IMPROVE LISTENING COMPREHENSION OF EFL STUDENTS

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### Abstract

This study investigates (1) the effect that the mobile-assisted language learning (MALL) application may have on the understanding of listening texts of EFL students as well as (2) their perceptions of this MALL application as a tool to improve their listening comprehension. To accomplish these aims, a one group pretest-posttest design was used to investigate whether the MALL application developed for mobile devices could enhance students' listening comprehension. A MALL application called *mListening* was designed and developed in this study. It had 6 lessons, each of which consisted of a pre-listening comprehension quiz, word-building and conversation, listening comprehension exercises, and a post-listening comprehension quiz. 18 EFL students at Mahachulalongkornrajavidyalaya University Nakhon Ratchasima Campus used *mListening* in an English speaking and listening class for 8 weeks. Findings indicate that students' performance on *mListening* reflects their progress in listening comprehension. This progress is further supported by the positive correlation between the students' *mListening* performance and their gains on a listening post-test which is significantly higher after the MALL activity. The students also expressed positive views towards *mListening* as an effective tool for improving their listening comprehension.

**Keywords:** Mobile-Assisted Language Learning, M-learning, Listening Comprehension

## 1. Introduction

Along with the advancement of mobile technology, mobile-assisted language learning (MALL) is becoming increasingly a new challenge in language education. MALL has attracted much attention with its perceived advantages over traditional computer-assisted language learning (CALL), especially in terms of portability and the convenience of touching the screen to control the MALL lessons on mobile devices. According to Kukulska-Hume (2009), mobile devices are superior to computers in portability, allowing learners to easily carry them anywhere and use a MALL application whenever they need. Existing studies try to investigate the effects of a MALL application on the improvement of learners' listening skills, revealing positive outcomes of both learning achievement and attitudes (Salameh, 2011; Lin & Chen, 2012; Al-Jarf, 2012; Hwang & Chen, 2013; Oberg & Daniels, 2013). MALL-related studies, however, continue to be carried out to discover how a MALL material assists learners to acquire a language, considering the ideal conditions which are facilitative for acquiring a language and the new features of mobile technology advancement which support a new design of MALL materials.

This study designed a MALL application by following the principles of listening processes for comprehending a text and the guidelines for a MALL design based on some factors facilitative for comprehending a listening text (Chappelle, 1998). Then the application was implemented with EFL students in an English listening and speaking class. The study has two purposes: (1) to examine the effect that the mobile-assisted language learning application may have on EFL students' listening comprehension and (2) to investigate their perceptions of *mListening* as a learning tool to improve their listening comprehension. This paper reports on the development and implementation of a MALL application, *mListening*, as a supplementary tool for EFL students' self-listening activities.

## 2. Literature Review

### 2.1 Listening Comprehension

Listening comprehension involves top-down and bottom-up processes (Grabe, 1991; Mendelsohn, 1998; Celce-Murcia & Olshtein, 2000; Jung, 2003). Bottom-up processing tries to make sense of the listening texts by focusing on the vocabulary, the grammar or functional phrases, sounds, etc. Learners have to activate knowledge of the language system such as phonology, grammar, and vocabulary. Top-down processing, on the other hand, starts with background knowledge called schema and learners, while listening to the texts, are required to activate schematic knowledge and contextual knowledge. Schematic knowledge includes an activation of the content schema (the background information on the topic) and formal schema (knowledge of how discourse is organized). Contextual knowledge refers to the knowledge about the participant, setting, and topic.

Peterson (2001), however, points out that in order to comprehend a listening text, learners need to use both top-down and bottom-up processing simultaneously. This is called an interactive process. While listening to a text, learners need to apply knowledge of sounds, grammar, conversational mechanism, cohesion, discourse structure, discourse type, and social relationships, all at the same time. Similarly, Joiner (1997) and Puskas and Otto (1997) state that listening is a complex cognitive process in which listeners have to construct meaning by using both linguistic and non-linguistic knowledge to comprehend a text. They need to employ knowledge of words, grammatical rules, and cognitive and social skills in order to understand the text. In addition, Rost (1991) mentions that listening is a coordination of the perception skills,

analysis skills, and synthesis skills which learners are required to integrate while listening to a text. Perception skills consist of discriminating sounds and recognizing words. Analysis skills involve identifying grammatical units and pragmatic units. Synthesis skills are the ability to connect linguistic and other cues and to use background knowledge.

According to the listening processes deemed facilitative for listening comprehension as mentioned above, designing a listening lesson needs to promote students' use of both top-down and bottom-up processing. A listening lesson often has three parts: pre-listening, listening task, and post-listening (Nunan, 2003). Firstly, a pre-listening task aims to warm-up learners' non-native language skills before doing a listening task. It can help learners achieve the balance between top-down and bottom up processing. In many warm-up activities, learners perform tasks to activate their schemata—essentially reminding themselves of content related to what they will hear, as well as vocabulary and forms that will carry the content. Secondly, the listening task aims to listen for a purpose. While listening, learners may try to listen for identifying the main idea, finding specific information, finding more details, and making inferences. Finally, a post-listening task aims to check the answers to comprehension questions, either by the teacher telling the learners what the correct answers are, by eliciting answers from the students themselves, or by having students compare their answers in pairs or small groups.

## 2.2 *Mobile-Assisted Language Learning*

Mobile-assisted language learning (MALL) refers to learning a language through mobile devices such as mobile phones, tablets, MP3/MP4 players, video games, etc. (Kukulka-Hume & Shield, 2007). This term is derived from “mobile learning” or “m-learning”, the general term for the use of mobile devices in education. MALL has attracted much attention with the unique feature of mobile devices, which is portability. That is, it is convenient to carry and use them for learning a language at any time, in any place (Geddes, 2004; Trifanova, Knapp, Ronchett, & Gamper, 2004; Yamaguchi, 2005). As Kukulka-Hume and Shield (2008) point out, MALL uses personal, portable devices which enable new ways of learning, emphasizing continuity or spontaneity of access and interaction across different contexts of use, so it differs from computer-assisted language learning.

MALL parallels the advancement of mobile technology. Mobile phones, for example, had some limitations in education in the past. With advances in mobile phone technology, the limitations have begun to dissipate. Since 2007, capabilities of mobile phones have been enhanced. Mobile phones with a touch-screen have become smartphones, which have many capabilities like those found in computers. Nowadays, it is easier to use smartphones to surf the Internet, check e-mail, send messages, record voices or videos, play audio/video files, take a picture, etc. A lot of mobile applications or apps, such as YouTube, Facebook, Twitter, and Skype, can be downloaded and installed on smartphones from the online store.

With the rapid advancement of mobile technology, MALL has recently become the focus of attention in technology-enhanced language learning (Kukulka-Hume, 2009). In terms of MALL for listening, many empirical studies have focused on the effects of MALL applications on learners' listening comprehension performance. Most existing studies related to MALL for listening have reported learners' higher gains in listening ability. For example, Yamada and others (2011) investigated the effectiveness of a web server smartphone application on the improvement of English listening comprehension of 39 volunteers who were sales staff in a large Japanese company. The application is based upon audio-video clips of workplace scenarios and accompanying tutorial exercises. The staff used it on their own time for three weeks. The researchers found that the developed smartphone application was effective in improving listening

comprehension performance. Lin and Chen (2012) studied the effect of podcasts on listening ability, which were sent to students' smartphones via e-mail. 25 college volunteers in Taiwan participated in the study, which exploited publicly available podcasts targeting specific vocabulary items and grammar points sent to them twice daily for a month. The study revealed that a post-test after the first two weeks confirmed large gains in listening ability. Al-Jarf (2012) examined the effect of using self-study MP3 L2 English lessons (TalkEnglish) on the listening skill of university students in Saudi Arabia. Compared to a control group of 44 university students who received only classroom instruction, an experimental group of 46 students used TalkEnglish for 12 weeks as a course supplement. The application was accessible via mobile phone, MP3 player, or other mobile devices. It was found that students in the experimental group outperformed the control group in listening, which was attributed to the extra practice they received through TalkEnglish. Hwang and Chen (2013) investigated the effect of using a PDA-based multimedia application for improving the listening skill of 30 pupils in a primary school in Taiwan. The pupils trialed the application during their lunch hour, four days per week, for two months. Using the PDA-based multimedia application, they listened to lessons and recorded their reading of basic words and completion of simple sentences having to do with their lunch menu. Results indicated that this group made significantly higher gains in their listening skill compared to a control group who studied without PDA support. Regarding attitudes towards the use of MALL application for improving listening comprehension, a few empirical studies found that students had positive attitudes towards improving their listening comprehension performance through a MALL application. Salameh (2011) designed a prototype mobile phone off-line multimedia language learning system primarily intended to support English listening comprehension of 60 university students in Palestine. Each Flash-based lesson of the system consists of several slides containing text, picture and audio followed by multiple choice comprehension questions. After the MALL activity, students express a very positive view towards the system. Similarly, Oberg and Daniels (2013) investigated students' attitudes towards the use of the iPod Touch to access an online L2 English textbook-based application of listening and quizzes. 61 university students in Japan participated in this study. After 15-week period of using the application, the experimental group indicated very positive attitudes towards self-study iPod-based learning. A study by Nah (2011), however, showed an increase in neutral attitudes towards using mobile phones to access the Internet to improve their English listening comprehension with a decrease in both positive and negative attitudes. The decrease in positive attitudes was attributed in particular to the extra expense for the Internet connection and the limitations of mobile phone technology.

### 2.3 *Designing a Mobile-Assisted Language Learning Application (mListening)*

In designing a mobile-assisted language learning application called *mListening*, the researcher followed the principles of listening processes for listening comprehension and mobile-assisted language learning as mentioned above. Moreover, *mListening* was developed on the basis of the hypotheses about ideal conditions for second language acquisition as suggested by Chappelle (1998). The design of *mListening* is based on seven guidelines: (1) students are provided with human-mobile device interaction for active learning by tapping on buttons available in the application to play, stop, or repeat; (2) the content is relevant to students' lives, interests, and/or academic goals; (3) the student's attention is drawn to language features found in the listening texts; (4) listening tasks are divided into pre-listening, while-listening, and post-listening; (5) the students' background knowledge about the text is activated before listening; (6) vocabulary available in the text is taught before listening; and (7) some linguistic features in the

texts are made salient by highlighting—coloring or underlining words and sentences in order for students to notice some linguistic features in the texts, since it is hypothesized that this noticing of linguistic input is necessary for student’s language development. When some words or sentences are noticed by students, the students may pay closer attention to form and meaning of the language (Tomlin & Villa, 1994).

To investigate the effect of *mListening* on EFL students’ listening comprehension, two research questions were considered in the implementation phase of this MALL application.

1. What was the effect of *mListening* on EFL students’ listening comprehension?
2. How did the students perceive *mListening* as a tool for improving their listening comprehension?

### **3. Method**

#### *3.1 Participants*

Students in this study were 18 EFL university students enrolled in the Listening and Speaking I course at Mahachulalongkornrajavidyalaya University Nakhon Ratchasima Campus, a Buddhist university in Thailand, in the first semester of 2014. All students were Buddhist monks ranging in age from 20 to 25 and they were competent users of computers and Internet services. 17 out of 18 students owned Android mobile devices—including smartphones and tablets—that could play the MALL application. The researcher had one student borrow his Android tablet for using the MALL application developed in this study.

#### *3.2 Materials*

The materials were integrated into the course syllabus and consisted of a pre-test, a post-test, a questionnaire, and *mListening* which was specifically designed for practicing listening comprehension skills in this research. All the materials were tested and improved during three pilot studies in an EFL class of the same level and proofread by an experienced EFL lecturer and a native English lecturer in the first semester of 2013.

##### *3.2.1 Listening Comprehension Pre/Post Test*

A 20-item listening comprehension test was used as a pre- and post-test at the beginning and at the end of the experiment to gauge students’ improvement in listening comprehension. The listening comprehension test consisted of dialogues of a similar format, theme, and length as the ones used in *mListening* with particular focus on listening for finding specific information and details, and for making inferences. The reliability coefficients (Cronback’s alpha) for the pre- and post-test items were .753 and .754 respectively, which were acceptable for a 20-item test (Alderson, Clapham, & Wall, 1995).

##### *3.2.2 Student Questionnaire*

In order to understand the EFL students’ perceptions of *mListening*, the questionnaire was implemented after the MALL activity. The questionnaire elicited the students’ views towards the MALL application and examined the rationale behind the views. The perception questions were constructed either in the format of statements accompanied by a six-point Likert scale or open-ended questions.

##### *3.2.3 mListening*

The main material in this study was a MALL application entitled “*mListening*” which was a native Flash-based application that could be played on Android mobile devices or iOS devices. *mListening* consisted of six lessons: (1) personal profiles, (2) countries and languages, (3) occupations, (4) free time activities, (5) possessions, and (6) buying things. Each lesson comprised a pre-listening quiz, word-building and conversation, a listening exercise, and a post-

listening quiz (see Figure 1). The listening exercises and quizzes offered listening texts accompanied by multiple choice comprehension questions. The listening texts were the recordings of short and long dialogues given by English native speakers. The 10-item listening quiz was used as a pre- and post-listening quiz for each lesson. It consisted of two listening texts with five comprehension questions each. The students progressed through the *mListening* by tapping on a button displayed on their mobile devices' screen to go to a help page that explained the application and how to control it. Then, they studied the content of each lesson by doing a pre-listening quiz, word-building and conversation, listening exercises, and a post-listening quiz.



Figure 1: Screenshots of *mListening*

### 3.3 Procedures

This study was conducted as part of the Listening and Speaking I course syllabus and it took place over 8 weeks. The class met once a week for two hours in the classroom and the students were also encouraged to review the *mListening* app outside of the classroom. After all students had completed the pre-test, a short in-class demonstration of *mListening* was carried out. The students were trained on how to use *mListening* and were directed to explore the user's manual. The lecturer explained and showed functions of *mListening* and asked students to explore the specific functions of *mListening* on their own devices. The lecturer also briefly repeated the

demonstration throughout the first week to make sure students felt comfortable using *mListening*. In the next class period, the students started *mListening* at least one lesson per week and used headphones to listen to the texts in order not to disturb one another. In the eighth week of study, they completed the post-test. Then they proceeded to the questionnaire.

Students' listening comprehension performance on the exercises and quizzes on *mListening* was automatically recorded in a server-side database. Students' scores gained on a pre- and post-test and their perception of *mListening* were gathered to support the quantitative findings in this study.

To help better self-regulate their listening practice, students were permitted multiple attempts or reviews of each *mListening* lesson during the experiment. Only the scores of students' first completed attempt in each lesson were collected because scores from later attempts could have been inflated due to a practice effect.

### 3.4 Analysis

To answer the two research questions in this study, the data were analyzed using quantitative and qualitative data analysis approaches.

To address research question 1 about the students' listening comprehension performance after the *mListening* application, the scores that students gained from listening exercises and quizzes on *mListening* were analyzed with mean and standard deviation to investigate students' listening comprehension performance on *mListening*. Then students' mean scores obtained from the pre-test and post-test were compared using a dependent sample t-test to investigate their learning achievement after the MALL activity. The correlations (Pearson's *r*) between the students' listening comprehension performance on *mListening* and their learning achievement were also analyzed to check if the *mListening* performance correlates with the learning achievement.

To address research question 2, examining students' views towards the *mListening* application after the activity, the questionnaire responses were analyzed to see how students perceived or thought about *mListening*. The responses concerning students' perceptions were tallied and their responses to open-ended questions were identified and coded into views towards *mListening* and other concerns, which helped explain the quantitative findings.

## 4. Results and Discussion

### 4.1 Students' Listening Comprehension Performance

As shown in Table 1, the students generally achieved a high score in both listening comprehension exercises ( 12.62 out of 15) and listening comprehension quizzes (7.63 out of 10) on *mListening*. They also scored higher in both exercises and quizzes on *mListening* from Lesson 1 to Lesson 6. It is encouraging that students improved their listening comprehension in both exercises (from 12.11-13.50) and quizzes (from 7.11-8.61).

Table 1: Students' Listening Comprehension Performance on *mListening*

	Listening Comprehension Exercises		Listening Comprehension Quizzes	
	Mean (15)	SD	Mean (10)	SD
Lesson 1	12.11	.96	7.11	.83
Lesson 2	12.17	.99	7.28	.57
Lesson 3	12.33	1.03	7.39	.70
Lesson 4	12.56	.98	7.44	.62
Lesson 5	13.06	.64	7.94	.73

Lesson 6	13.50	.71	8.61	.70
Total	12.62	.38	7.63	.56

When comparing means of exercises and quizzes between Lesson 1 and Lesson 6 with a paired sample *t*-test, it shows that statistically significant differences were found in means of exercises ( $t = 4.415, p = .000$ ) and quizzes ( $t = 6.891, p = .000$ ).

To investigate the long-term effect of *mListening* on the improvement of students' listening comprehension ability, students' mean scores on pre-test and post-test were also analyzed. As shown in Table 2, the mean scores for pre-test and post-test were 8.44 and 15.50 respectively, and students did better on the post-test, a finding already reported in the literature (Yamada et al, 2011; Lin & Chen, 2012; Al-Jarf, 2012; Hwang & Chen, 2013). This indicates a good performance on post-test and a good improvement from pre-test to post-test. The mean scores for pre-test and post-test were significantly different at the .05 level ( $t = 18.410, p = 0.000$ ).

Table 2: Results of Comparing Means for Pre-Test and Post-Test

	n	Mean (20)	SD	<i>t</i>	<i>p</i>
Pre-test	18	8.44	1.65	18.410	0.000
Post-test	18	15.50	1.92		

A closer look at the means revealed that the mean for the post-test (15.50 out of 20) was significantly higher than that of the pre-test (8.44 out of 20). This may suggest that the students produced a higher learning achievement after the MALL activity, and their listening comprehension was enhanced by *mListening*. Table 3 shows a series of correlation coefficients (Pearson's *r*) between the students' listening comprehension performance on *mListening* and on pre/post test scores.

Table 3: Correlations Between *mListening* Performance and Pre/Post Test Scores

	<i>mListening</i> performance	
	Listening comprehension exercises	Listening comprehension quizzes
Pre-test	.325	.274
Post-test	.343	.378
Test gains	.575*	.594**

Note. Test gains were obtained by subtracting pre-test scores from post-test scores.

\*Correlation is significant at the .05 level (2-tailed).

\*\*Correlation is significant at the .01 level (2-tailed).

It is noteworthy that students' listening comprehension performance on *mListening* positively correlated with pre/post test scores, even though no statistical significance was found. The positive correlations in Table 3 are from test gains and mean scores for exercises (.575) and quizzes (.594) with statistical significance at the .05 level and at the .01 level, respectively. These positive correlations suggest that students made some progress in listening comprehension ability after learning through *mListening*.

In this classroom-based study, it is not possible to attribute directly any improvement to the use of *mListening* due to the lack of empirical data on how students process each part of *mListening* designed in accordance with the ideal conditions deemed facilitative for second



language acquisition guided by Chappelle (1998). Future studies on the effect of *mListening* may focus on the processes of how students use activities provided in *mListening* to assist in comprehending the listening text by recording students’ logs while using the application.

#### 4.2 Students’ Perceptions of *mListening*

To better understand the effect of *mListening* on the improvement of students’ listening comprehension, the responses to the questionnaire items after the MALL activity were analyzed. All 18 students responded to the questionnaire, representing a response rate of 100%. The first part of the questionnaire was about students’ perception of *mListening*. This part consists of 10 statements using a six-point Likert scale with 1 meaning “completely disagree” and 6 meaning “completely agree”. The responses to this section are summarized in Table 4. Overall, most students expressed good views towards the use of *mListening* as a tool for improving their listening comprehension.

Table 4: Students’ Perception of *mListening*

Statements (ML = <i>mListening</i> )	1 Completely Disagree – 6 Completely Agree						Disagree 1-3	Agree 4-6
	1	2	3	4	5	6		
1. ML allows you to know your learning progress immediately.	0%	0%	0%	9%	11%	80%	0%	100%
2. ML allows you to practice English listening everywhere and every time you need.	0%	0%	0%	0%	33%	67%	0%	100%
3. ML gives you more chances to review ML lessons for practicing more.	0%	0%	0%	0%	56%	44%	0%	100%
4. You can use ML to practice English listening outside of the classroom.	0%	0%	0%	4%	82%	14%	0%	100%
5. ML helps improve your English listening comprehension.	0%	0%	0%	2%	15%	82%	0%	100%
6. Learning a conversation in the pre-listening task helps you comprehend the listening text.	0%	0%	4%	0%	83%	13%	4%	96%
7. Learning vocabulary in the pre-listening task helps you comprehend the listening text.	0%	0%	6%	0%	94%	0%	6%	94%
8. ML raises your interest in practicing English listening.	0%	0%	0%	2%	20%	78%	0%	100%
9. ML makes you inconvenient to practice English listening.	50%	34%	6%	10%	0%	0%	90%	10%

10. It is difficult to use ML. 11% 73% 6% 10% 0% 0% | 90% 10%

This finding corresponded to the studies of Salameh (2011) and Oberg and Daniels (2013), showing that students expressed very good views towards the MALL application after the experiment. In regard to the features of *mListening*, all students (100%) agreed that *mListening* allowed them to know their learning progress immediately and to practice English listening everywhere and every time they need. All of them also agreed that *mListening* gave them more chances to review *mListening* lessons for practicing more, and they could use *mListening* to practice English listening outside of the classroom. These are unique features of mobile application providing immediate feedback after completing exercises or quizzes, so students can check right away whether they select the correct answer or not. Through portability of mobile devices, students can use the MALL application on mobile devices to practice English listening in any place and at any time, both inside and outside of the classroom according to their needs (Kukulka-Hume & Shield, 2008).

As for aspects related to the effect of *mListening* on students' listening comprehension, all students (100%) believed that *mListening* helped improve their English listening comprehension. 96% of the students agreed that learning a conversation in the pre-listening task helped them comprehend the listening text, and 94% of the students agreed that learning vocabulary in the pre-listening task helped them comprehend the listening text. These results may help support the effect of *mListening* on improving students' listening comprehension. According to the principles for MALL design based on ideal conditions facilitative for second language acquisition (Chappelle, 1998), word-building and conversation activities were put on *mListening* as pre-listening tasks. Learning some vocabulary and conversation related the listening texts to which students are going to listen is an effective way to prepare them for comprehending the listening texts and to arouse their background knowledge about the text as well.

Regarding the students' perceptions about how they felt about *mListening*, all students (100%) reported that *mListening* raised their interest in practicing English listening. 90% of the students did not agree that *mListening* was inconvenient to practice English listening, and it was difficult to use *mListening*. This may be because the design of *mListening* in terms of user interface and format of listening tasks is interesting, and it can motivate students to practice listening. Moreover, with the easy use of the touching system on mobile devices, it is convenient to practice listening through touch-screen mobile devices.

The last section of the questionnaire included two open-ended questions eliciting students' opinions about how *mListening* helps them improve listening comprehension and some suggestions about *mListening*. For the first question, 12 out of 18 students expressed that *mListening* helped them improve their English listening skill. As a student said, "The application helps me improve my listening skills very much". In addition, a few students expressed how *mListening* helped them improve listening skills in terms of understanding the meaning of words and details of the listening texts. As a student said, "The application helps me develop my listening skills in terms of listening for details" and another said, "The application helps me know the new words". Another question asking about suggestions on *mListening*, the students' answers to this question varied and were useful for improving the MALL application. Firstly, more contents of English such as grammar and pronunciation should be added to *mListening*, as a student said, "There should be more contents for practicing listening". Secondly, slow and fast playback options should be provided to control the recordings on *mListening* as a student said,

“Listening texts should have slow and fast speeds, which the learners can choose”. Thirdly, the students commented that *mListening* should provide a glossary option and keys for both exercises and tests as a student said, “The list of important vocabulary of each lesson and the answer keys should be provided”. Finally, the students said that the other skills of English such as reading and writing should be added to *mListening* because it would help the students develop every skill of English at the same time.

## 5. Conclusion

The analyses in this study show that students scored higher in both exercises and quizzes on *mListening* from Lesson 1 to Lesson 6, indicating that students improved their listening comprehension. Their listening comprehension performance on *mListening* was also positively correlated with their score gains between pre- and post-tests of listening comprehension. This finding was further supported by their significantly higher gains in listening comprehension performance after the MALL activity, doing better on the post-test.

Overall, *mListening* is a positive example of mobile-assisted language learning as it was perceived by students as a useful learning application for an EFL listening class. It was reported that *mListening* was regarded as beneficial in assisting students to improve their listening comprehension performance. Research and development related to MALL needs to be carried out further as it will help illuminate helpful factors for developing an effective MALL application.

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