

The Role of Prior Knowledge in Promoting Higher-Order Thinking Skills
in Japanese as a Foreign Language

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ABSTRACT

This study investigates the role of prior knowledge in supporting Japanese foreign language (FL) learners' L2 higher order thinking skills. Scholars recognize prior knowledge integration as the critical stage where learning occurs (Anderson et al., 2001; Britton, 1994; Kintsch, 1988, 1998), and consider it an untapped resource in the FL classroom (Bernhardt, 2005; Hulstijn, 2011; Koda & Yamashita, 2018). To this end, Koda & Yamashita (2018) developed the *reading to learn* framework, which entails the extraction of text information, integration of relevant prior knowledge with text content, and refinement of knowledge. Employing this framework, this study investigates the role of prior knowledge in promoting FL learners' *reading to learn* skills. Sixty-six Japanese as a foreign language learners took two versions of a *reading to learn* test, where they read about societal issues in Japan. One version provided scaffolding to help learners integrate relevant prior knowledge with the text, while the other version provided language activities. Students then expressed their refined understanding of the topic in a series of reflection questions, which were scored and coded for prior knowledge activation. Findings reveal that the scaffolding condition slightly increased learners' prior knowledge activation, but did not affect learners' reflection scores, which were mainly predicted by the response length. Although learners displayed adequate reading comprehension and coherent writing, poor scorers tended to not use information from the text or their prior knowledge to support their conclusions. These findings suggest that FL learners can be encouraged to utilize their world knowledge in class, but may lack the motivation or linguistic fluency to explain this knowledge when discussing complex cultural issues. Learners may benefit from integrated language and content learning activities, where they can obtain more practice with *reading to learn* and recognize it as a desirable learning outcome.

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CHAPTER 1

Introduction

With the expansion of information-based technology, industrialized markets, and globalization, the 21st century calls for new approaches to developing students' higher order reading and thinking skills in preparation for college, career, and world-readiness. Our global workforce requires workers who can not only grasp important ideas from texts, but also critically analyze, synthesize and transform information into new discursive forms for economic and social participation (Shanahan, Shanahan, & Cartright, 2008). Twenty-first century literacy skills draw upon students' ability to not only understand the basic content in texts, but also to classify, draw connections, synthesize, critically evaluate, and refine their understanding of text topics. The importance of these literacy skills is recognized by foreign language educators (ACTFL, 2012), who have developed educational standards to support these skills, and second language reading scholars (Enright, Grabe, Koda, Mosenthal, Mulcahy-Ernt, & Schedl, 2000; Koda & Yamashita, 2018), who have developed research frameworks and assessments to investigate these skills. In the context of foreign language instruction in a classroom setting, Koda and Yamashita (2018) developed the *reading to learn* framework, a pedagogical approach heavily grounded in established theories of reading and learning that foster and monitor students' ability to use higher order reading and thinking skills. *Reading to learn* entails the ability to extract text information, construct personal-meanings, and refine knowledge. Reading and learning theories consistently acknowledge the role of prior knowledge integration in meaning construction and knowledge expansion (e.g., Adams, 1994; Anderson et al., 2001; Britton, 1994; Kintsch, 1988, 1998; Sternberg, 1999). As outlined in Blooms' taxonomy (Anderson et al., 2001), higher order thinking skills involve the ability to a) retrieve relevant information from long-term memory, b) construct meaning from the instructional messages, c) break material into parts to determine

relationships, d) evaluate information for internal and external consistency, e) put elements together into a coherent whole, and f) apply information to solve problems, make suggestions, or plan solutions (see Appendix A). All of these skills overlap with those required for L1 and L2 stages of *reading to learn* (Chall, 1983; Koda & Yamashita, 2018).

In the foreign language classroom, one can argue that students who are taught to utilize their higher-order thinking and *reading to learn* skills are better prepared to communicate in diverse discourse communities and professionally engage in global issues such as trade, diplomacy, science, and technology. Consequently, language learning in the foreign language classroom setting should strive to foster the integration of text information with prior knowledge.

Although *reading to learn* skills require both language proficiency and cognitive learning skills, traditional approaches for teaching and researching L2 reading tend to conflate students' language proficiency and cognitive intellectual abilities. This conflation is partially a product of historical trends in L2 reading research. Over the past 40 years, mainstream L2 reading research has investigated the explanatory power of the Linguistic Threshold Hypothesis (LTH; Cummins, 1979), which states that L1 reading resources are not available in the L2 until a threshold level of language proficiency is met. If cognitive intellectual abilities are an L1 resource, studies supporting LTH imply that university-level foreign language learners cannot make use of their cognitive intellectual abilities until they have high levels of proficiency in a foreign language. This notion is reflected in the Common European Framework Reference for Languages (CEFR: Council of Europe, 2001) and the American Council on Teaching Foreign Languages (ACTFL, 2012) proficiency scale descriptions, where the ability to speak about a variety of intellectual topics is only included in the categories of "advanced" and "superior" levels of language proficiency.

Hulstijn (2011) criticizes this conceptualization of language development because he views a distinction between “higher cognitive language” (HCL) and “basic cognitive language (BCL) abilities. HCL refers to the ability to use complex, abstract, and intellectual language for higher order thinking, while BCL refers to basic, everyday language used for conversation and survival. According to Hulstijn, L2 learners can develop HCL or BCL in their second language, but BCL is not a prerequisite of HCL: “L2 learners can be as proficient in HCL as L1-ers of the same intellectual, educational, professional, and cultural profile, despite some deficiencies in their L2 BCL” (p. 242). In other words, if L2 learners already have developed HCL in their first language from L1 educational experiences, they should also be able to develop HCL in their second language.

In fact, evidence from cognitive neuroscience suggests that HCL in the first language can facilitate the development of HCL in the second language. MacSwan and Rolstad (2005) draw on the psychological modularity theory and evidence from case studies to show that cognitive skills are facilitated by language, and once developed, these cognitive skills become available as a resource in other domains. These models of language and cognition have strong implications for adult foreign language learners. Most students in foreign language programs at institutions of higher education have already developed abilities to engage in intellectual thought, abstract reasoning, and higher order thinking in their first language. Even with an imperfect BCL, scholars have argued that students’ L1-developed cognitive skills can be utilized as a resource to engage with course materials in L2 classrooms and develop L2 academic language in the context of academic practice (Bernhardt, 2005). This approach has the potential to help students simultaneously acquire content knowledge using well-established L1 higher order skills, along with L2 linguistic knowledge and related skills. At the same time, it provides teachers and

researchers with a means to observe how students use a wide range of individual experiences and prior knowledge to understand and interact with the world they reside in, and do so through a second language.

To date, few studies have examined the role of higher order reading and thinking skills in L2 reading comprehension and assessment. One reason is that traditional reading assessments have intentionally tried to avoid using measurements that require the integration of prior knowledge. Understandably, test developers made this choice because studies arising from schema theory (e.g., Carrell, 1983; Steffensen, Joag-Dev, & Anderson, 1979; Verhoven & Droop, 1998, 2003), concluded that tasks requiring prior topic knowledge may unfairly penalize readers with less topic and cultural knowledge, and put students from minority backgrounds at a disadvantage (Cummins, 1980; Reynolds et al., 1982). While this was a laudable and important drive to promote equitability within standardized testing, it also had the indirect effect of discouraging students' use of higher order thinking skills during the reading process; preventing investigations into how prior knowledge is used as students interact with text information, how it influences readers' complex mental representations, and how it influences their development of the target language. Since traditional tests of reading comprehension discourage students' use of prior knowledge, foreign language learners have not been socialized into a learning practice where they are encouraged to reflect on foreign language texts in relation to what they know about the world. This is an unfortunate washback effect in the foreign language classroom, especially in an era that emphasizes the importance of promoting students' intercultural competence.

Intercultural competence has been defined by many scholars as an important content learning goal for the foreign language classroom. Byram (2000) describes it as the ability to see

internal and external relationships between different cultures, with the ability to interpret each culture in terms of the other. It is also someone who has a critical or analytical understanding of their own and other cultures; who is conscious of their own perspective and the way in which their thinking is culturally determined, rather than believing that their understanding and perspective is natural (p. 9). Using the term *transcultural competence*, the MLA Ad Hoc Committee (2007) describes it as the ability “to function as informed and capable interlocutors with educated native speakers in the target language” and “to reflect on the world and themselves through the lens of another culture and language” (p. 238). For both Byram and the MLA Ad Hoc Committee, intercultural competence includes thinking about cultural topics from a target culture perspective, recognizing diversity within the target language culture, and reflecting on their own culture and themselves through comparisons with the target culture. Since the term *intercultural competence* has gained more popularity in recent years when describing this skill set (Deardorff, 2006), this term is used for the remainder of the paper.

In the context of the foreign language classroom, students need to engage in higher order thinking processes to gain skills to foster intercultural competence. Based on definitions she synthesized from research and experts, Deardorff (2006) created a pyramid model to describe the facets of intercultural competence. In this model, higher-order thinking skills are considered part of the “Knowledge and Comprehension” facet of intercultural competence, specifically referred to as skills “To listen, observe, evaluate, analyze, interpret, and relate” (p. 256). These skills are all also vital during the *reading to learn* process in order for students to refine their understanding of the passage topic.

Reading cultural texts is considered a robust method for promoting students’ intercultural competence (Koda, 2010; Gomez, 2007) because it can expand their knowledge of the world, help them understand and communicate cross-culturally with other communities, and reduce the proliferation of prejudices, stereotypes, and racist attitudes. While it is relatively easy

for students to make connections between specific cultural products and personal experiences, it is cognitively and intellectually challenging for students to engage in abstract cultural comparisons that help them reflect on and develop complex understandings of the world. Current theoretical approaches to reading and learning suggest that by guiding students to integrate their prior cultural knowledge with information presented in cultural texts, students should be better equipped to engage in these L2 abstract thinking skills already developed in their L1 (e.g., Hulstijn, 2011; MacSwan and Rolstad, 2005).

In summary, little work has been done to investigate how we can best support adult L2 learners' use of higher order reading skills and cognitive learning skills during the L2 reading process. In order to fill this gap and advance our understanding of the field, this dissertation investigates the extent to which prior knowledge integration assists higher order thinking and learning during the reading process. The following sections describe the theoretical and pedagogical frameworks supporting the importance of prior knowledge integration in the higher order reading and thinking process. I first review Kintsch's construction-integration model of reading (1988, 1998), and then introduce ways that Koda and Yamashita's (2018) *reading to learn* framework draws heavily on theories of reading and learning to guide practice in the foreign language classroom. Based on principles from these theoretical frameworks, the research objectives and questions are presented.

Theoretical Framework

Among the most widely accepted models of reading used today, most recognize reading as an interactive process at the word, local sentence, and global passage level (e.g., Adams, 1994; Stanovich, 1980; Rumelhardt, 1994; Kintsch, 1988; 1998). Kintsch's construction-

integration model describes this interactive process as different levels of interlinked cognitive processes. At the surface level, readers come across different lexical and grammatical forms, visual and semantic memories are instantly activated, and the correct meaning is decided upon when the “perceived” meaning is integrated with the reader’s prior knowledge. Prior knowledge integration helps readers decide which elements fit together and which do not; elements that do not fit are deactivated. At the textbase level, there are multiple interlinked connections between written word forms, lexical meanings, local text meanings and readers’ prior knowledge. Readers use their linguistic knowledge (e.g., lexical and syntactic knowledge) to construct surface and text-base level understandings of a passage. As readers continue to integrate information from their prior knowledge and other areas of the passage, readers build situation-specific representations of the text, referred to by Kintsch (1988; 1998) as the situation model.

The situation model is what accounts for individuals’ different *interpretations* of texts; in other words, what theorists and educators are usually interested in when they think of reading comprehension (Kintsch, 2013). According to Kintsch, situation models are developed from readers’ mental representations, which consist of “some change in the way the mind views the world as a result of reading a text . . . some sort of trace of the text they read, including indirect effects, cognitive as well as affective ones” (p. 807). Here Kintsch emphasizes the reader’s change or refinement of knowledge about the world as a result of interaction with a text. Importantly, the process itself demands readers’ reflection on their prior knowledge or view of the world. Kintsch also claims that when readers engage in building a situation model, the process is heavily influenced by their beliefs, attitudes, and cognitive processes. Depending on a reader’s interests, purpose, background knowledge, they may form widely different situation

models. In turn, readers' beliefs, attitudes, interest, and knowledge reciprocally develop during the process of building a situation model.

What happens when readers form adequate text bases, but lack the motivation or skill to build sophisticated situation models? This may happen when readers construct adequate text bases, but fail to link them to relevant portions of prior knowledge. When this happens, it results in what Kintsch refers to as "encapsulated" knowledge, where readers are unable to apply information from the text to other situations. For example, a student may read and understand all the ideas in a passage about the conditions under which they use a given mathematic formula, but without forming a complex situation model, they may not be able to apply this information to a relevant real-life situation. In order to successfully apply information from texts, Kintsch notes that it "requires strategic action and effort on the part of the reader" (2013, p. 812).

Acknowledging the importance of reading strategies and skills, Koda and Yamashita (2018) designed the *reading to learn* framework to support students' use of strategies for building complex situation models.

Conceptual Framework

The L2 *reading to learn* framework by Koda and Yamashita (2018) was designed as a pedagogical approach for foreign language classrooms in higher education and entails three interlinked operations: text-meaning building, personal-meaning construction, and knowledge refinement. Text meaning building involves extracting linguistic information from the text, retrieving the correct meanings, and assembling these meanings at the word, sentence, paragraph, and passage level. Linguistic information from the text is assembled into meanings that correspond with learners' prior knowledge and real-life experiences, allowing learners to identify main ideas from each section, guess words from context, fill in information gaps between

sentences, identify co-referents, and integrate local text meanings into a coherent whole. Text meaning building relies heavily on linguistic knowledge and the ability to connect relevant world knowledge to make sense of the text.

Personal-meaning construction occurs when learners connect text information with stored knowledge at the local and global levels. In the context of a second or foreign language classroom, learners are reading texts about specific subjects, such as science, art, or culture. Students construct personal meanings when they connect abstract concepts presented in the text with their previously held knowledge about the topic and personal experience. This process is an integral part of the *reading to learn* process, as “*Learning during reading only occurs when learners recognize any such restructuring in their existing knowledge as a result of reading*” (Koda & Yamashita, p. 5).

The last operation, knowledge refinement, happens when learners incorporate personal text meanings into their stored knowledge bases. Learners express their knowledge refinement when they evaluate comparisons they’ve made between content and their own knowledge, select pertinent comparisons, and use those selections to support their conclusions and deeper understanding of the topic.

In this project, text-meaning construction, personal-meaning construction, and knowledge refinement are referred to as *Comprehension*, *Analysis*, and *Reflection* respectively, to describe types of pedagogical activities. The types of skills utilized in the comprehension, analysis, and reflection stages of *reading to learn* are outlined in Table 1.

Table 1. Definitions and Components of *Reading to learn* Skills

Comprehension: Constructing text meaning (linguistic comprehension) that correspond to learner's real-life experiences stored in memory
<ul style="list-style-type: none"> • Integrate individual word meanings into local text meanings • Infer the meaning of culture-specific words and phrases based on local text meanings and prior knowledge • Identify the main idea in each paragraph • Integrate the main ideas into a coherent whole • Identify the author's view on a focal topic
Analysis: Constructing personal meaning by connecting text meanings with prior knowledge
<ul style="list-style-type: none"> • Compare text information with the learner's personal experiences • Compare text information with what the learner knows about the topic • Compare the view presented or implied in the text with the learner's own view on the focal topic
Reflection: Recognizing conceptual restructuring induced by constructed text meanings
<ul style="list-style-type: none"> • Reflect on similarities between the author's view and what the learner knows about the topic • Reflect on differences between the author's view and what the learner knows about the topic • Reflect on changes, however subtle they may be, in the learner's view of the topic after reading and personalizing the input source passage

(adapted from Koda and Yamashita, 2018)

Cognitive learning theories that informed this framework include but are not limited to Blooms' taxonomy (Anderson et al., 2001), the developing expertise model (Sternberg, 1999), and inquiry-based learning (Banchi & Bell, 2008). These learning theories all describe the importance of providing guided activities for students that allow them to relate new information to prior knowledge already stored in memory.

To summarize, *reading to learn* involves extracting literal information from text, analyzing the information in relation to previously acquired knowledge, and restructuring the relationship between concepts based on one's analyses.

Research Objectives

The purpose of this dissertation project is to investigate the role of prior knowledge integration in fostering foreign language learners' higher order reading and thinking skills. Kintsch's CI model posits that prior knowledge is integrated with text information at word, sentence, and global level of the reading process. Koda and Yamashita's *reading to learn* framework outlines a theoretically-grounded approach for utilizing prior knowledge in the reading and learning process. In order to synthesize knowledge from the literature concerning the role of prior knowledge in reading and higher order thinking, a search was conducted for empirical studies addressing the following issues:

1. What skills do second language readers need to build complex situation models and show gains in higher order reading and learning processes?
2. What is the relationship between prior knowledge integration and an individual's ability to express learning due to interaction with a text?

CHAPTER 2

Review of Literature

A review of the research database revealed that few published L2 studies have investigated the role of prior knowledge integration during the L2 reading process for the purposes of content learning. However, there are four related veins of research that can inform our understanding of the relationship between prior knowledge and higher order thinking during the reading process. The first section reviews L2 studies that have investigated correlations between domain-specific topic knowledge and reading comprehension of texts. The second presents insights gained from L1 reading research that have investigated the relationship between learners' integration of prior knowledge with text material and their content learning skills. The third section discusses the limited number of studies examining standardized assessments of higher order reading and thinking skills. Finally, the last section reviews studies of pedagogical interventions that have used various forms of scaffolding to support higher order thinking skills and discuss the implications.

Domain-specific Background Knowledge and Reading Comprehension. Several studies have investigated the role of discipline specific knowledge in L2 reading comprehension. Barry & Lazarte (1998) examined domain-related knowledge, syntactic complexity, and reading topic on inference generation in a recall task. Recognizing the importance of prior knowledge integration, they identified within-text inferences and elaborative inferences within a written text recall task. Within-text inferences were defined as instances where readers summarized ideas from the text, whereas elaborative inferences were instances where the reader combined concepts from the text with their prior knowledge. Forty-eight learners of Spanish in high school were divided into high and low-knowledge groups, and asked to read three expository L2 passages with different topics and levels of syntactic complexity. High-knowledge readers were able to

generate more accurate within-text and elaborative inferences, as shown in a text recall task, despite the fact that the low knowledge group had an extra year of experience learning Spanish.

These results indicate that learners' ability to make elaborative inferences on a specific subject and build mental models of the text depend partially on prior knowledge of the subject. In addition, they demonstrate that text recall can be used as a way to observe learners' conceptual restructuring via *elaborative inferences*, despite claims that recall only measures textbase knowledge (McNamara et al., 1996; van Dijk & Kintsch, 1983).

In a related study, Uso-Juan (2006) looked at discipline-related knowledge, L2 proficiency level, and academic proficiency among 380 L1 Spanish undergraduates at various levels of L2 English proficiency. A series of multiple regression analyses were used to specify the levels at which discipline related knowledge and English proficiency could compensate for each other. English proficiency was measured using three cloze tests with lexical and grammatical word deletions. L1 discipline related knowledge and L2 reading comprehension skills were measured for three areas: psychology, marketing, and engineering. The L2 reading skills assessed included learners' ability to infer new words from context, identify the antecedents of referential expressions, summarize the text, and answer literal fact-based and inference questions. Results indicated that English proficiency accounted for 58-68% of the variance in reading comprehension and discipline-related knowledge accounted for 21-31% of the remaining variance.

These results support existing literature that L2 proficiency and prior knowledge are important contributors to reading comprehension; however, based on the description of their instruments, the reading comprehension tasks were largely limited to questions that did not require the integration of their prior knowledge at the conceptual level. In other words, reading

questions did not require learners to use their discipline knowledge when engaging with text ideas or in answering comprehension questions. As with many reading comprehension tests, learners only needed to gain surface-level knowledge of the text to do well on the comprehension test; in other words, it did not require them to link text information to other relevant portions of prior knowledge. If learners had been given a reading task that engaged them in higher order thinking skills, it's possible that Uso-Juan may have found stronger relationships between academic proficiency and reading.

Kendeou and Broek (2007) investigated the effects of prior knowledge and text structure on cognitive processes of college students' comprehension of expository texts. They measured prior knowledge of 86 U.S. college students by having them take a multiple-choice test on Newtonian mechanics. They then measured reading comprehension on a separate set of texts using both online and offline tasks. The online task was a think-aloud, in which they identified metacognitive processes readers engaged in, such as comprehension monitoring, making correct and incorrect inferences, and "conceptual changes," described as times when the reader compared text information with prior knowledge. The offline task was a written recall. Using repeated measures ANOVAs, the authors found that readers with more prior knowledge made significantly more correct inferences and used significantly more conceptual change strategies. They also found that participants with higher prior knowledge performed significantly better on the written recall. In short, the learners with more prior knowledge were better at making local inferences, expressed more "conceptual changes," and were better at remembering explicit meanings from the text. Unfortunately, we are unsure of any causal relationships, as it is not clear if the high-knowledge participants were better at comprehension, better learners, or simply better-informed.

Joh (2004) examined 157 Korean high school and college EFL learners' prior knowledge, L2 vocabulary, and L2 syntactic knowledge on L2 reading comprehension. She then measured participants' domain knowledge with two assessments. Joh first had participants answer questions about the topic in their L1 Korean, and then had them translate 10 key words from each text. To measure reading comprehension, she had participants answer questions about the main idea, explicit details found in the text, and inference questions for six expository texts. English proficiency was measured using a 30-item test with questions about syntax, vocabulary, and reading comprehension. Using correlational analysis, she found that there was a significant correlation of $r = 0.71$ ($p < .01$) between L2 English proficiency and reading comprehension. She also found a moderate correlation between topic knowledge (measured in L1 Korean) and reading comprehension ($r = 0.34$, $p < .01$) and a strong correlation between topic vocabulary and reading comprehension ($r = 0.67$, $p < .01$). While, correlational analysis cannot determine cause-effect relationships between prior knowledge, cognitive processes, and L2 linguistic knowledge, the study provides further evidence that prior knowledge is an important component of reading comprehension and that this may be mediated by knowledge of topic-specific L2 vocabulary.

Finally, Brantmeier (2005) investigated how L2 reader's domain knowledge, text type (with or without analogy), and type of test (written recall, sentence completion, and multiple choice) affects first and second language reading comprehension. Brantmeier conjectured that analogies may help students connect their prior knowledge with the text because they provide information that is more familiar to students. On the other hand, Brantmeier also hypothesized that analogies may inhibit comprehension because it requires learners to allocate more cognitive resources to decoding words and understanding syntactic structures. Fifty-three EFL university students in Costa Rica and 240 students of Spanish from two U.S. universities read passages with

analogies or without analogies, answered comprehension questions, and took a subject knowledge test in their L1. The passages were the same except that one version had an analogy added; for example, the human eye was compared to a camera lens in the analogy version. Results showed a significant main effect of subject knowledge for reading comprehension of both passages on all three comprehension tasks. Also, participants scored significantly higher on the recall task for the nonanalogy texts, with remarkably higher scores. They performed slightly better on the nonanalogy texts for the multiple choice and sentence completion comprehension tasks, but the differences were not significant.

This study also confirms the importance of prior knowledge (in this case subject knowledge) in supporting reading comprehension. In addition, Brantmeier concluded that this study also supports previous research (Hammadou, 2000) that analogies do not support reading comprehension. These findings are interesting because analogies were viewed as a type of scaffolding to help students integrate prior knowledge with text information. However, this line of thought assumes that the reader will have more familiarity of the analogy than the new information, which may not always be the case. In addition, the presence of analogy does not necessarily guarantee that readers actively engage in the process of prior knowledge integration itself, which is another variable that deserves investigation.

In summary, studies investigating the contribution of domain knowledge to reading comprehension have demonstrated that L2 linguistic knowledge plays an important role in mediating the use of domain knowledge in L2 reading, specifically towards textbase comprehension of the text. Studies also consistently demonstrate that prior knowledge aids reading comprehension, but it is not yet clear how learners use their prior knowledge to help

them with comprehension, storing text ideas in memory, or how they mentally restructure their understanding of a topic in relation to their prior knowledge.

Relationships between reading, prior knowledge integration and learning skills.

Several L1 and L2 reading studies have investigated the relationship between learners' integration of prior knowledge and learning skills. In this review, "learning skills" encompasses academic performance measured by course grades as well as acquisition of content knowledge from a text. Pretorius (2005) worked with English native speakers and English language learners (ELLs) in South Africa, examining the relationship between readers' academic performance, language proficiency, and ability to integrate prior knowledge with the text in anaphor resolution. Pretorius focused on anaphor resolution as a type of *reading to learn* skill that requires readers to link textually given information with global knowledge or previously mentioned text information through lexical and semantic cues. Students were placed into four different levels of academic knowledge based on their performance in psychology and anatomy courses (fail, at risk, pass, or distinction). English proficiency was measured using a 60-item multiple-choice test and anaphor resolution was measured using an "identification by underlining" task with 38 anaphoric ties. Results revealed a significant relationship between learners' anaphor resolution and L2 proficiency ($r = 0.737$, $p < .001$), although this difference diminished as English proficiency increased. In addition, ELLs with stronger academic skills (pass or distinction) were significantly better at resolving anaphors.

The first finding from this study indicates that anaphor resolution is highly related to L2 linguistic knowledge during reading comprehension, and the second suggests that students who do not perform well academically are students who have trouble integrating incoming text information with previously given text information. This finding is interesting because it

supports the notion that prior knowledge integration at all levels of the reading process, in this case anaphor resolution, may be an important skill for supporting academic success.

Beck, McKweon, Sinatra, and Loxterman (1991) explored relationships between prior knowledge, inferencing ability, and retention in long-term memory among L1 readers in fourth and fifth grade. Specifically, Beck et al. looked at children's ability to understand two versions of a text about the French and Indian War. The first version did not provide supportive background information to help readers make correct inferences. For example, it did not explain that many colonists were still loyal to Britain in the 1760s, but this prior knowledge was necessary to understand why there was growing tension. Without prior knowledge, it was common for readers to make the incorrect inferences; for example, that the French and Indian war was between the French and Indians. The second, revised version of the text included additional information that supplied children with relevant background knowledge to make correct inferences.

After giving the two text types to 85 fourth and fifth graders, they found that students who read the second text performed better on a reading comprehension test and retained more information in memory. By providing the relevant background information students needed to integrate information and make inferences, students were better equipped to engage with the texts. For upper elementary school children with little prior knowledge of the focal topic, they likely benefited from explanatory background knowledge because it helped them make accurate inferences based on what little prior knowledge they had about war and the parties in conflict. However, it is not clear if they were better at recalling the text because of increased reading comprehension or if increased opportunities for successful inferencing and prior knowledge integration aided storage in long-term memory.

McNamara, Kintsch, Songer, and Kintsch (1996) investigated how U.S. middle school students with high and low topic knowledge of a text integrated background knowledge while reading texts with high and low levels of coherence. Similar to Beck et al., they purposefully manipulated a text about heart disease into versions with high and low-level coherence. They predicted that students with less domain knowledge would not be able to make successful inferences when reading low coherence texts. In contrast, they predicted that students with more knowledge about heart disease would benefit from low coherence texts because they would be forced to use their prior knowledge of the topic to make inferences while reading. Using a keyword sorting task, the authors were able to show that high prior knowledge groups' "mental restructuring" significantly changed before and after reading when they read the low coherence texts. The keyword sorting task was able to show mental restructuring by asking students to rate how related different keywords were in the text before and after reading. In addition, high prior knowledge groups who read the high coherence texts displayed less "mental restructuring" during the sorting task, which was interpreted as lower learning gains.

This study looked beyond basic comprehension skills to observe gains in conceptual knowledge when learners had opportunities to integrate prior knowledge with text information. The use of a keyword sorting task allowed the researchers to see where readers made new connections between concepts and ideas expressed in the texts, suggesting that activation of prior knowledge through inferencing can lead to higher order thinking.

O'Reilly and McNamara (2007) built on McNamara et al.'s (1996) research by investigating students' reading skills in addition to their level of prior knowledge and text-inferencing skills among high and low coherent texts. They had 143 college students complete three tasks: 1) A prior knowledge test on biology, humanities and general sciences, 2) a

comprehension skills test, 3) a text-inferencing task with either a low and high cohesion passage about cell mitosis. They manipulated the cohesion of the passages by adding more noun phrases, descriptive elaborations, sentence connectives, and other cohesive devices to the high coherence passage. The text-inferencing task questions consisted of 5 open-ended bridging inference questions, which could only be answered by integrating information among more than one sentence. A 2x2x2x2 ANOVA indicated that high prior knowledge students demonstrated better inferencing skills during low cohesion texts, but only if they had poor reading skills. High prior knowledge students who had strong reading skills did not show any improvement in bridging inference skills based on text cohesion. As we would expect, students with low prior knowledge were better at making bridging inferences when reading the high coherence text. Overall, O'Reilly and McNamara's study tells us that prior knowledge, reading skill, and text coherence are important factors to consider in supporting learners' ability to integrate information across sentences. This ability is important for personal-meaning construction on a local level, but it does not inform our understanding of prior knowledge integration on a global level, where students restructure relationships in stored knowledge by reflecting on how text information fits in with their knowledge about the world.

Horiba and Fukaya (2015) looked at 145 Japanese EFL learners' ability to recall texts on health-related topics and how this related to prior knowledge integration. They tested the influence of domain knowledge of a reading passage by comparing nursing and nonnursing students, who were asked to read narrative texts about a patient's experience in a health care system. They used propositional analysis of text recalls to compare low and high topic knowledge readers on two factors: a) ability to recall causal events, and b) overall propositional recall. The authors reasoned that causal events were more likely to be remembered and recalled

because learners are more likely to integrate background knowledge and make inferences to understand the text. Findings indicated that students with higher topic knowledge of health were significantly better at recalling health-related information than students with low topic knowledge. In addition, students were also found to remember causal events more often than other propositions. These results are consistent with Beck et al. (1991) and McNamara et al. (1996), indicating that learners are more likely to remember and recall propositions of the text where they actively integrated prior knowledge to make local and global inferences.

First and second language reading research reviewed in this section suggest that academic performance or content learning are more successful when readers are better at making accurate inferences, or are forced to make inferences. Several of the studies do not provide clear insight into the exact factors that aided reading comprehension or learning, but others such as McNamara et al. (1996) demonstrate that L1 readers conceptually learn more from texts when they are able to integrate prior knowledge with text information. These results appear to support Kintsch's model of reading, but none of these studies address foreign language learners or prior knowledge integration beyond anaphor resolution and local coherence gaps between sentences.

Assessment of Higher-order Reading and Content Learning. This section reviews studies on how assessments have been used to measure students' use of higher order reading and thinking skills. While traditional reading assessments have focused on textbase reading comprehension, recent advances in computer-based tests have to some extent been able to measure critical thinking skills, content learning, or knowledge acquisition after reading. Most of the research on these assessments are published by research groups connected to standardized testing agencies such as the Educational Testing Service (ETS) and the Partnership for Assessment of Readiness for College and Careers (PARCC). These studies have explored ways

to assess higher order reading skills and content-learning among first and second language readers through short answer response or essay tasks.

Trites and McGroaty (2005) designed a standardized assessment to measure basic reading comprehension, skills for *reading to learn*, and skills for *reading to integrate* information across multiple texts or modalities (e.g., reading and listening). Their constructs of *reading to learn* and *reading to integrate* were based on the TOEFL 2000 reading construct paper by Enright et al. (2000), where *reading to learn* entails the ability to integrate and connect information presented by the author with what they already know. *Reading to integrate* entails the ability to integrate information from multiple sources on the same topic, taking into account rhetorical and contextual information. The test was taken by 105 adult English native speakers and 146 nonnative speakers. For the *reading to learn* task, students read a 1200-word passage and completed a chart which required them to recall and categorize information reflecting the macro-rhetorical structures of the passage. For the *reading to integrate* task, students read two 600 word texts and composed a written synthesis, analyzing topics on social and environmental science issues. Both tasks were scored for expressing accurate connections, including specific information, and integrating content from the readings. The authors found that learners' native language and level of education had a significant effect on their overall test performance. Native speakers (NS) of English did significantly better than nonnative English speakers (NNS) on the *reading to learn* task. In addition, NNS graduate students did significantly better than NNS undergraduate students.

These results suggest that both language proficiency and academic experience play an important role in learners' ability to demonstrate *reading to learn* skills. In addition, the authors noted that *reading to learn* and *reading to integrate* had lower correlations with basic

comprehension than with each other, and therefore postulated that they rely on a distinct set of skills.

Koda and Yamashita (2018) implemented reading to learn assessments among 48 students in four universities in Japan in EFL classrooms and the beginning and end of a course. The assessments used passages that compared cultural perspectives on educational issues in the Japan and U.S. The two versions created included the three operations, comprehension, analysis, and reflection. Test results indicated that students made significant gains in text-meaning building, personal-meaning construction, and knowledge refinement over the semester. They noted that students performed well on the analysis section of both tests, at 85% and 99% respectively, and suggested that this may be due to limitations of a multiple-choice question format, where students may not have had enough opportunity to demonstrate their capacity and involvement of personalizing local and global text meanings.

They suggest that students' gains in the reflection essay section were partially due to students' increased awareness and conscious effort to improve the *reading to learn* skills explicitly clarified during the course, citing evidence from survey responses and teacher observations. However, the authors noted that students did not make significant gains the content and reflection categories of their essays.

The authors pointed out two limitations of the reading to learn assessments. First was the limitation of multiple-choice questions in providing students with the opportunity to construct text meanings and personalize information. Second was that the cross-cultural comparison skills needed to score well on the reflection essay were not covered in the textbook, practiced in class or promoted in the curriculum. If the test items were refined and used in a course that supports

cross-cultural comparisons as part of the learning objectives, the results may have witnessed larger gains in the content and reflection categories of students' essays.

The Partnership for the Assessment of Readiness for College and Careers (PARCC) standardized assessment also uses essays as one of the tasks for measuring children's higher order reading and thinking skills. It is one of the two commonly used state-wide assessments used in U.S. public education for the Common Core State Standards (2010), which emphasizes the importance of integrating English language arts with content learning. PARCC employs the automatic scoring system, Pearson's intelligent essay assessor (IEA), to rate students' essay responses. Foltz, Streeter, Lochbaum and Landauer (2013) launched a study to look at the inter-rater reliability of IEA on the essay portion of the assessments with human scorers. They administered 75 prompts to grades 3, 5, 7, 9, and 11, collecting 648 to 10,387 responses for each prompt. The IEA was trained on two thirds of the response data and tested on the last third of responses. Using several inter-rater agreement measures, including Pearson's correlation (r) and quadratic rated Kappa, they found that the automatic scoring systems and human raters had consistently high inter-rater reliability among the two to three traits measured, which included written expression, knowledge of language and conventions, and reading comprehension of key ideas and details. The section with the least reliability was knowledge of language and conventions, which is notorious for being the most challenging to rate by both computers and humans. Lochbaum et al.'s study demonstrates that computer-based tests have made significant advances in their ability to evaluate students' conceptual learning and content knowledge through automatic scoring. While they concluded that the automatic scoring system could replace one of the human raters with similar results, the whole process required a massive amount of data collection and human resources. Such an assessment validation process may be

impractical for foreign language programs that want to monitor students' content learning skills based on their own specific program goals.

In order to automatically assess learners' content knowledge in short answer response questions, Leacock & Chodorow (2003) developed an automatic scoring system called "C-rater," that they used on the National Assessment of Educational Progress. When analyzing a short answer, it identifies the predicate argument structure of the response, including co-referents for pronouns, noun phrases and word roots, and takes into account that many words can be used to express the same meanings. Using knowledge of the syntactic relationships between content words in the text, it compares the students' response with a list of model answers.

Leacock and Chodorow based the scoring system on clear rubrics and piloted C-rater at several institutions. They consistently found average agreement rates with human raters to be 84% among all institutions. These findings seem to indicate that automated scoring of short answer questions have reasonable potential for measuring students' higher order reading and learning skills if there are clear criteria for correct and incorrect responses. However, there needs to be a clear protocol for how to design question items and well-defined scoring rubrics for this system to work.

In the assessment studies covered in this section, Trites and McGroaty (2005) looked at the influence of basic reading comprehension on *reading to learn* and *reading to integrate*, Koda and Yamashita (2018) looked at EFL students' *reading to learn* skills over one semester, and Leacock and Chodorow (2003) and Foltz et al. (2015) focused on validity of their automatic scoring instruments in scoring content learning skills. The first two studies demonstrated that higher order thinking skills are likely to depend on basic "textbase" reading comprehension, and the second two studies demonstrated that assessment and automatic scoring of content-learning

constructed response items is possible, but requires a large amount of pilot data for training and testing the system. All four studies display the importance of well-designed questions and scoring rubrics in assessing students' content learning skills. Importantly, Koda and Yamashita's study illustrate the importance of designing *reading to learn* assessments to align the content-learning skills that are prioritized and practiced in the course learning objectives.

Pedagogical Scaffolding of Higher order Reading and Thinking. Another body of research has looked at the potential of different pedagogical scaffolding activities in developing learners' higher order reading and thinking skills. Such pedagogical activities include concept mapping, guided questions, and facilitated discussion. A literature search was conducted for studies on scaffolding tasks and activities that have been used to support reading, where the focus was not only on textbase comprehension, but also engagement with higher order thinking skills. Because an initial search resulted primarily in studies that focus on textbase comprehension, terms such as "content learning" and "critical thinking" were also included. Studies were included if they looked at students' ability to apply information from the text to new situations, perform problem-solving tasks, or demonstrate other skills that require connections made between text material and prior knowledge were included as higher order thinking skills (Anderson et al., 2001).

In a philosophy course at Carnegie Mellon University, Harrell (2008) looked at the effect of argument mapping on helping college students extract logic from texts and write argumentative analyses, a type of higher order thinking skill that requires general problem-solving skills. Spread across two semesters and six sections of classes, total of 269 students were split into a treatment group, that received instruction and assignments on argument mapping, and a control group, that were not taught the skill. They administered pre and posttests that consisted

of short argumentative text followed by five questions: 1) stating the conclusion of the argument, 2) indicating how the premises are related, 3) providing a visual representation of the argument, 4) deciding whether the argument was good or bad, and 5) explaining their reasoning. Results revealed that both experimental and treatment groups made gains over the semester and there was no significant difference between these gains. However, when they further separated out the treatment group into students who made few correct arguments maps (0-2) and students who made many correct argument maps (3 or more), they found that students who made many correct arguments maps made significantly higher gains than those who only made a few correct argument maps. They used a general logistic model to predict gains based on maps created and used pretest scores as a covariate. The differences in the number of maps created significantly predicted gains on the posttest (Semester 1: $F = 28.13$, $p < .001$; Semester 2: $F = 37.78$, $p < .001$).

The results of Harrell's (2008) study indicate that argument maps may improve student's ability to analyze arguments if students make the effort to complete them and do so accurately. The study focused on a content course in English at a U.S. university and while the number of L1 and L2 English speakers were not reported, we can assume that all participants had a strong command of English to get accepted into a prestigious academic institution. For this reason, we cannot be sure if argument mapping would be effective for foreign language learners with less L2 linguistic knowledge. However, a related study on EFL learners provides insight to this question.

Eftekhari and Sotoudehnama and Marandi (2016) looked at the effect of assessment modality, (computer vs. paper pencil) and the pedagogical approach (argument mapping vs. traditional reading comprehension scaffolding) on EFL learner's critical thinking skills. They

taught students in the argument mapping groups how to construct argument maps over several classes. Before and after, they had students take the California Critical Thinking Skills Test. They found that the combination of computer-mediated scaffolding and argument mapping resulted in greater gains on the inferencing and inductive reasoning skills than groups who received traditional reading instruction or were asked to construct argument maps on paper.

The researchers speculated that the computerized argument mapping may have improved learners' reasoning by making students perform more deliberate practice than traditional approaches. They reasoned that the computer allowed presentation in an integrated, hierarchical, organized manner, while the paper and pencil mapping was time-consuming and tiresome because they were not able to quickly modify maps and the process required careful printing. If computers can improve the efficiency and ease of constructing argument maps, then it may reduce the cognitive burden on learners and increase opportunities for L2 learners to engage in higher order reading and thinking skills. In addition, it may be important to help learners develop “correct” and accurate concept maps if they are to benefit from the activity.

Chularut and DeBacker (2004) investigated the influence of concept mapping on ESL learners' achievement, self-regulation, and self-efficacy as they read passages. Seventy-nine students were divided into control and treatment groups. The treatment group read passages and received instruction on how to create concept maps over five classroom sessions, receiving feedback on their concept maps from instructors during each class session. The control group read the same passages, studied individually and engaged in group discussion during each class. Before and after the classes, students took an achievement test. The achievement test was used to measure the students understanding of the reading passages that were studied during the experiment. The test included information from each of the five reading passages used in the

study sessions, and consisted of 52 multiple choice questions design to test students' knowledge, comprehension, and application skills (Blooms, 1956). Test results indicated that both groups made significant gains over the 5 classes, but that the concept mapping group made significantly more gains than the individual study group.

The authors speculate that through concept mapping, students may have come to understand not only the ideas in the passage, but the relationships among those ideas, leading to a more complete understanding of the passages. In addition, construction of concept maps may have spurred students to make more explicit links to prior knowledge compared to students in the individual study plus discussion group, which may account for their greater ability to recall information from the passages.

Other common classroom scaffolding techniques include the use of guided questions and discussion of reading materials. While this format is common in L1 English classrooms in the U.S., it is much less common in foreign language classrooms. To this end, Gomez's (2012) study is notable because it looked at the effectiveness of four pedagogical approaches aimed at developing EFL learners' intercultural competence through the study of American literature. Each pedagogical approach implemented different forms of scaffolding, mainly through guided questions and discussion. The approaches included an inquiry-based, dialogical, transactional, and a content-based learning approaches. Each approach was used once for each class session, where the 23 EFL students discussed the short, nonfiction narratives by Americans from diverse backgrounds.

In the inquiry-based approach, students were given a study guide containing conceptual questions to direct their reading processes. After answering these questions at home, they came to class to speak about and compare their personal responses. In the dialogical approach, students

engaged in dialogue in small groups and as a whole class instead of answering questions. In the transactional approach, learners related their personal experiences to the main character's experiences, tried to identify with the character, expressed their opinions about the topic, talked about their own experiences, and referred to related events outside the text. Finally, in the content-based approach, learners discussed literary topics such as characters, conflicts, ideas, symbols, points of view, and themes. Each of the five multicultural literary texts were read outside of class and discussed over the period of one to two weeks. Data was collected in the form of observations and field notes, student journal entries, and student interviews.

Gomez found that all four pedagogical approaches supported learners' intercultural competence by giving them opportunities to think, manipulate information, express personal ideas, compare and contrast information, find and investigate historical events and literary topics, defend a point of view, and address conclusions from the literary works they read. Students highly favored the inquiry-based approach, remarking that the guided questions were a useful means for them to focus their attention, provided them time to think, and allowed them to prepare for class discussion. One student claimed that the dialogic approach allowed her to share her thoughts, complement ideas, and extend her perspective. The researchers found that after the transactional approach, students reflected in their journals on intercultural attitudes, including the ability to respect others, the importance of being tolerant, and the need to become open-minded to other views and beliefs. Finally, the content-based approach learners identified important information about traditions, beliefs, and values reflected in the texts, and talk about how this was reflected in the characters' actions.

There are several notable factors that may have contributed to the success of these pedagogical approaches. One is that students noted on several occasions how comfortable they

felt in the classroom discussing topics and relating personal experiences without being judged. This sense of rapport among classmates and teachers is not always present in classrooms, but likely made a difference in the effectiveness of the discussions. In addition, the students appeared highly motivated. Before research started, learners had been given a presentation explaining the constructs of intercultural competence, authentic literary texts, and American multicultural literature. After this presentation, learners indicated that they were interested in intercultural competence and wanted to improve upon it. Also, despite stating that the readings were difficult, they reported using more reading strategies and using the dictionary more often than usual because they enjoyed the content and thought the pedagogical support helped. It is not clear if learners had received this type of pedagogical approaches to reading literature before, but if they had been socialized into these types of classroom discussions from other classes, then this would also have improved the effectiveness and students' reception to the approaches.

Gomez's (2012) study provides implications for foreign language classrooms with integrated language and culture learning goals. In addition, it demonstrates how learners develop and refine their understandings of culture through discussion and interaction with literary texts. The students actively discussed abstract cultural concepts represented in the text, incorporated relevant prior knowledge and experiences to the main characters and situations, reflected on their own perspectives, and refined their understanding of their own cultures in the process.

Studies reviewed in this section suggest that various types of scaffolding can assist students' development of higher order thinking skills during the reading process. There are still too few studies on scaffolding of higher order thinking skills for us to draw conclusions about the effectiveness of certain types of scaffolding (e.g., argument maps, graphic organizers) over others, or about the effectiveness of modality (e.g., computer vs. paper and pencil). However, all

activities used within these studies required students to engage in “personal-meaning construction” by linking text information with prior knowledge.

Summary. The review of literature provides several insights to the role of prior knowledge integration with texts in higher order thinking. Studies investigating the contribution of domain knowledge to reading comprehension suggest that L2 linguistic knowledge plays an important role in mediating the use of domain knowledge in L2 reading, specifically for gaining a basic, textbase comprehension of the text. Studies on prior knowledge activation and academic learning suggest that academic performance is often more successful when readers make more inferences, a skill that by definition requires prior knowledge integration with text ideas. Studies on assessment of higher order reading skills describe the importance of well-designed rubrics and pilot data for scoring student essays. Finally, studies on pedagogical scaffolding techniques for higher order reading to learn skills indicate that most types of scaffolding have been successful when students are willing to engage with it.

We have yet to see studies that address the influence of topic familiarity and L2 linguistic knowledge on what exactly participants “learn” from texts, or how they mentally restructure their understanding of a topic in relation to their prior knowledge. In addition, none of the studies address foreign language learners of languages other than English, nor do they address prior knowledge integration beyond anaphor resolution and local coherence gaps between sentences. While most studies on pedagogical scaffolding of higher order thinking appear effective, it is unclear if this will apply to foreign language learners with lower levels of language proficiency in higher education contexts. In response to this gap in the field, this dissertation investigates the effectiveness of prior knowledge scaffolding on students’ ability to express higher order thinking skills. The phrase, “prior knowledge scaffolding” is used to describe activities that focus on

helping students integrate their prior conceptual knowledge with text information. To guide this investigation, the following research questions were formed:

Research Questions

1. During the *reading to learn* process, can scaffolding enhance learners' ability to activate prior knowledge for personal-meaning construction?
2. Does prior knowledge activation enhance the learners' ability to express knowledge refinement?
- 3a. Does language proficiency affect how much the learner activates prior culture knowledge?
- 3b. Does language proficiency affect learners' expression of knowledge refinement?

CHAPTER 3

Methodology

Setting and Participants

Sixty-six Japanese as a foreign language learners were recruited from four different universities in the Northeastern United States. Learners were in their third and fourth years of Japanese study and were enrolled in Japanese programs that all emphasized language skills such as vocabulary growth and grammar structures. However, eight participants were recruited from a program that emphasized listening and speaking in the first two years of study, so third year students were in the beginning stages of learning to read and write. One program also emphasized the importance of culture-learning skills as one of its main program objectives in addition to reading, writing, listening, and speaking. In total, 12 participants were recruited from this university. The other two programs placed equal emphasis on the four skills, but did not explicitly list culture-related learning objectives in the syllabi of their courses.

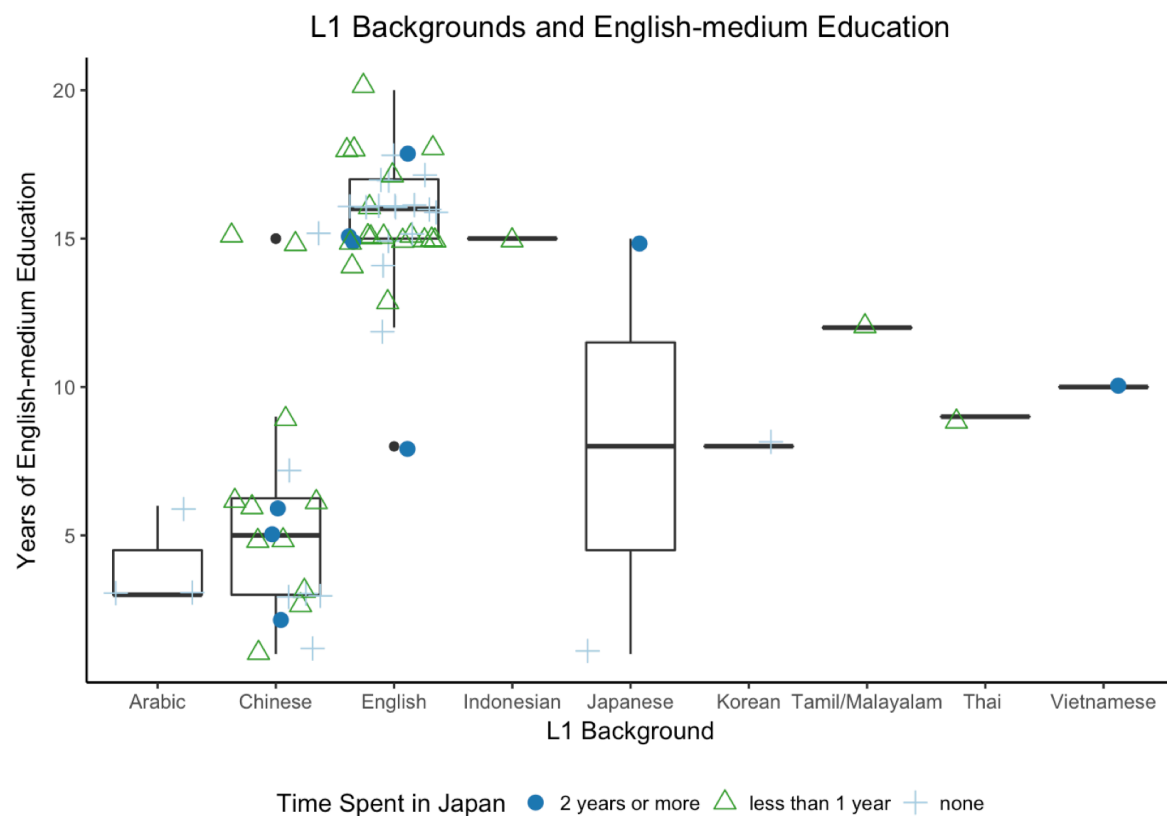
Students enrolled in their fourth to eighth semesters of Japanese (intermediate and advanced learners) were chosen for the study because they had a large enough linguistic repertoire in Japanese to extract meanings from text and express their understanding with help from a dictionary. These students consisted mainly of undergraduates, although some graduate students also enrolled. Most students who take these courses are interested in learning Japanese as a second language and often have some interest in Japanese culture.

Participants came from a variety of L1 and L2 backgrounds and experiences. Thirty-seven participants were L1 English speakers and 23 were L1 Chinese speakers. The rest of the participants had a variety of L1s, including 3 L1 Arabic, 2 L1 Korean, 2 heritage Japanese speakers, 1 L1 Vietnamese, 1 L1 Thai, 1 L1 Tamil/Malayalam, 1 L1 Hindi, and 1 L1 Bahasa Indonesia (Figure 1). Participants also had a variety of L2 experiences. Twenty-three

participants reported knowing English and Japanese, but the 43 other participants reported being fluent in a third language (usually their native language) or had studied other foreign languages, including French, German, Icelandic, Italian, Spanish, and Welsh.

While 47 participants received all of their education in the U.S., 7 stated they received education in both the U.S. and China or Taiwan. Another 9 stated that they received education in other countries, including Thailand, Vietnam, Saudi Arabia, the United Arab Emirates, Indonesia, and the Philippines. Two participants were heritage speakers of Japanese, with one who attended schools in the U.S., and the other attending schools in China before coming to the U.S. for university.

Figure 1. L1 Backgrounds and Years of English-medium Education



Note: Time spent in Japan refers to either years lived in Japan or the amount of time students studied abroad in Japan.

Measures and Instruments

Japanese Proficiency

Learners' L2 linguistic knowledge was measured using vocabulary questions from the Japanese Language Proficiency Test (JLPT; Japan Foundation, 2012), a test distributed by the Japanese Ministry of Education, Culture, Sports, Science, and Technology (MEXT) often used in job listings and résumés to indicate Japanese proficiency. There are 5 levels, where N5 is the easiest and N1 the most difficult. Questions from the vocabulary sections of the N2, N3, and N4 tests were combined in random order to create a 21-item vocabulary knowledge measure (Appendix B). The JLPT vocabulary questions heavily rely on knowledge of Japanese syntax, collocation, word usage, and inferencing ability, and were therefore used as a proxy for Japanese language proficiency. Students were awarded full points if they completed the task accurately. They were provided feedback with the number of questions they answered correctly at the end of the assessment, but this score does not impact their grade and is not used for the study's analysis.

Reading to Learn Assessments

Two versions of an integrated reading task (hereafter referred to as *reading to learn* assessments) were created with two linguistically and structurally comparable passages each describing a distinct topic, called "Global" and "Overwork" tests. Both passages were taken from a famous editorial column in the *Asahi Newspaper* called "Vox Populi" (*Tenseijingo* in Japanese) and adjusted to be of similar length and difficulty. The Global Text and Overwork Text are approximately 500 characters in length and rated as "upper-intermediate" texts, scoring 3.38 and 3.46 respectively on Lee and Hasebe's (2016) readability scale, (<http://jreadability.net/>). In the Global test passage, a Japanese writer laments the way Japan overemphasizes the

importance of becoming a “globalized citizen.” The Overwork test passage describes the tendency of Japanese people to spend long hours at work.

The first goal of the task was to have students identify Japanese views towards the focal content of the passage they read. The next goal was to have students compare their own culture’s practices and views, and reflect on what cultural insights they have gained through reading and analyzing the passage (e.g., how the dominant views on the topic relate to each country’s history, values, and societal behaviors). Each test has three parts: comprehension, analysis (incorporated as scaffolding), and reflection. The comprehension, analysis, and reflection sections are completed during class. A summary of each section and its goals are provided in Table 2.

Table 2. Description of *Reading to Learn* Tasks for Global and Overwork Tests

	Task Description	Goal
Comprehension	<p><i>Textbase comprehension</i></p> <ul style="list-style-type: none"> • Short answer questions on main ideas in each paragraph • Summarize the main points of the reading passage in English based on their answers to short answer questions <p><i>Technology-Enhanced Features</i></p> <ul style="list-style-type: none"> • Hyperlink dictionary glosses provide immediate English translations • Online bilingual dictionary tool of students’ choice 	<ul style="list-style-type: none"> • Scaffolds learners’ attention towards and comprehension of focal ideas expressed in the text. • English Summary checks learners’ comprehension of focal ideas from the text without demanding productive L2 linguistic knowledge.
Analysis (Scaffolding)	<p><i>Prior Knowledge Integration</i></p> <p>Compare own experiences, culture’s values and practices with Japanese culture, or relate prior knowledge of Japanese culture to passage</p> <ul style="list-style-type: none"> • Comparison charts • Short answer questions 	<ul style="list-style-type: none"> • Scores are based on completion, and indicate if scaffolding succeeds in increasing learners’ prior knowledge integration (RQ1)
Reflection	<p><i>Perspective-taking on main ideas</i></p> <p>Explaining how passage reading and analysis affect the learner’s views on the target culture and own culture.</p> <ul style="list-style-type: none"> • Long answer questions 	<ul style="list-style-type: none"> • Students’ responses are used to indicate knowledge refinement: reflecting on what they learned, how their understanding of the target culture and their own culture changed (RQ2).

Comprehension Section

Purpose. The comprehension section was designed to ensure that all students, regardless of variations in linguistic proficiency, were able to grasp the main ideas of the reading passage. Therefore, linguistic resources were provided (e.g., hyperlink dictionary glosses and bilingual dictionaries) as needed to help students extract locally coherent meanings from the reading passage. This decision was made because a pilot study indicated that students who did not achieve adequate understanding of text main ideas could not conceptually engage with the content of the text.

Task. Before students were given the passage, they were provided with an overview of the *reading to learn* tasks and reminded of the goals of the “assessment module,” which were to monitor and foster students’ skills for transcultural competence (Appendix C). Students were also reminded that they could use an online bilingual dictionary of their choice while taking the tests. After the short introduction, students were presented with the Global or Overwork passage on a computer screen. As they read, student answered open-ended short answer questions about the main ideas and perspectives expressed in the passage. There were three types of comprehension questions: (a) gist detection, (b) significant details, and (c) text-based inference. Although lexical inferences and co-reference identification were also considered important comprehension skills, due to time restrictions, the number of comprehension questions was limited to six for each test (Appendix C). The first five questions required short phrases in Japanese, while the last question for both tests asked students to summarize the passage in English. This task allowed students to express what they understood without relying on their L2 productive knowledge of Japanese. If students provided accurate answers to all questions, they received full points on the comprehension section of the test. Students were not given a strict

time limit on how to divide their time among the sections, but instructions suggested them to spend no more than 20 minutes on the *Comprehension* section of the test.

Analysis Section (Prior Knowledge Scaffolding)

Purpose. Conceptual scaffolding was provided by instructing students to compare their prior experiences and knowledge of their own culture with information about Japanese culture expressed in the text passage. Students began with conceptually easier comparisons between personal experiences and Japanese experiences expressed in the text. They then progressed to comparisons between cultural practices (e.g., learning English, working overtime without complaint) and finally, to comparisons between underlying cultural values in Japan and their own culture(s) that explain the phenomenon in question. For example, questions began by asking how many hours of work a week was typical in Japan and their own culture(s), but progress to questions about what cultural values influence the practice of overwork in each culture. In doing so, students were able to progress from more concrete comparisons to abstract cultural comparisons in attempt to help them refine previously held understandings of both cultures through personal-meaning construction. In the reading to learn framework, this process of personal-meaning construction is the critical point where mental restructuring and learning itself occurs.

Cultural Comparison Charts. Due to time restrictions, students were not required to fill out the comparison charts, but they were encouraged to at least consider answers to the questions presented in the chart. In addition, students were told they could answer in English or Japanese to emphasize conceptual engagement with the material over linguistic knowledge. Students completed graphic organizers that explicitly asked them to connect relevant prior experiences and cultural knowledge on one side of the table with cultural concepts from the text on the other

side of the table (Appendix D). This format was intended to help students compare Japanese cultural behaviors and values with their own cultural behaviors and values. For example, students were asked to compare their own personal experiences and beliefs about learning a foreign language with that of the passage author. This format was chosen because it overtly prompts students to connect prior knowledge with information from the passage. In addition, the ability to transfer one representation of information into another is considered conducive towards building a situation model (Kintsch, 1988, 1998; Zwaan & Radvansky, 1998).

Open-ended Cultural Analysis Questions. Short-answer questions in this section also prompted students to compare focal points and key ideas from the text with their own experiences and home culture(s). These questions were more specific than the graphic organizer questions because pilot tests revealed that for some students, graphic organizers were not specific enough to help them integrate prior knowledge with text information. For example, students were asked about what qualities a “global citizen” would have in Japan versus in their own culture (Appendix D). They were asked if they felt that speaking a foreign language supports “global citizenship.” Students receive points for this section if they showed an ability to integrate prior knowledge with focal ideas from the text, regardless of what type of prior knowledge or experience they introduced. Students were usually able to get full marks on this section if they followed instructions and completed the tasks.

Reflection Section

Purpose. The main purpose of the reflection section was to have students synthesize and express their refined understanding of the focal topic through long answer constructed responses (approximately 150 characters) in L2 Japanese. For pedagogical purposes, the tasks guide students to connect Japanese cultural values and behaviors expressed in the text with their own

cultural experiences to express their new understanding of a cultural phenomenon, in accordance with ACTFL's *Communication* goal (Standards 1.2, 1.3) (Appendix A). For research purposes, the task allows us to measure learners' L2 knowledge refinement, or higher-order thinking skills expressed in Japanese.

Reflection Rubric. The reflection rubric awarded a small percentage of points for productive language ability, but the majority of the rubric was dedicated to students' expression of knowledge refinement (Appendix E). For productive language ability, students received full points on the *Language* section of the rubric as long as small grammar or word-choice mistakes did not interfere with the coherence of their ideas. For knowledge refinement, students received points when they expressed higher-order thinking skills. These sections of the rubric were carefully designed to align with cognitive learning processes within Blooms' Taxonomy (Anderson et al., 2001) and the first 4 C's of ACTFL National Standards: Communication, Cultures, Connections, Comparisons, and Communities. Since the tests could not assess how students used language beyond the school setting, the reflection task could not assess this objective. However, the tables in Appendix A summarize how different sections of the *reading to learn* tests and reflection rubric aligned with Blooms' Cognitive learning processes and ACTFL National Standards. Since the ACTFL Standards were designed to support integrated language and culture learning, the following paragraphs focus on describing the reflection rubric's alignment with these standards.

The reflection rubric contained five sections to assess learners' knowledge refinement: *Prior Knowledge, Learn, Diversity, Compare, and Relationships* (Appendix E). The four reflection questions in each test had *Prior Knowledge, Learn* and *Relationships* sections within the rubric, but the *Diversity* was only included for the first two reflection questions, while

Compare was included in the third and fourth reflection questions. This was due to the nature of the questions, as the first two questions focused on Japan, while the latter two focused on learners' own culture. The *Prior Knowledge* section of the rubric was designed to support the Communication objective of ACTFL National Standard 1.3, where students "present information, concepts, and ideas to an audience." By having students communicate their previous viewpoints, the task is designed to raise students' awareness of their own culture and cultural perspectives by having them state their previous views towards the cultural issue. The *Learn* section of the rubric also aligns with the Communication objective of ACTFL's National Standards (Standards 1.2 and 1.3), where students present their understanding of the text and what they have learned to an audience. *Relationships* corresponds with the *Cultures* objective of ACTFL's National Standard 2.1, where students "demonstrate an understanding of relationships between cultural perspectives and practices."

For the first two reflection questions, students were awarded points for the *Diversity* if they addressed the diversity of views held within Japan. This partially supported ACTFL's Connections Standard 3.2, where "students acquire information and recognize distinctive viewpoints." However, the ACTFL Standards do not explicitly describe the importance of acknowledging diversity of viewpoints within one's own culture and the target culture. However, this was considered an important learning outcome, as both reading passages were written by Japanese authors with distinctively different viewpoints from "mainstream" Japanese society. For the second two reflection questions, students were awarded points for *Compare* if they used a comparison between Japan and their own culture to support their conclusions. This learning outcome aligned with ACTFL's Comparisons, where "students demonstrate

understanding of the concept of culture through comparisons of the cultures studied and their own.”

Reflection Questions. Students were shown the reflection rubric before they were given the reflection questions. The first question asked students to reflect on and state what they learned about Japanese culture since reading the passage, while the second question asked them how they would apply what they learned when communicating with Japanese people (Appendix E). The third question asked students to reflect on how their own views changed about the societal issue, while the fourth question asked students to reflect on how the passage influenced understanding of their own culture’s views towards the issue. Students received more points when they explained the influences on their understanding (e.g., cultural values, beliefs, attitudes, ideas) rather than just stating their point of view. Due to limitations in the computer-mediated platform, students were not able to look back at their responses in the *Comprehension* and *Analysis* sections as they wrote answers to the reflection questions.

Scoring Procedures. The principal investigator met with two Japanese instructors at one of the universities to discuss appropriate scoring procedures based on the rubric made for the reflection responses (Appendix E). Working with a subset of participants’ tests within the two instructors’ classes, details of the rubric were discussed to determine the appropriate scores to award and clarify what the main differences were between responses that deserved one, two, or three points on each section of the rubric. The principal investigator and Japanese instructors went through several rounds of scoring, and met approximately six times over 1.5 hour sessions to discuss our interpretations of the rubric, compare scores, and reach a consensus on how to clarify the rubric with each round. After refining the scoring process, a graduate student researcher was hired to score 30% of the reflection responses. This researcher was a highly advanced Japanese speaker

and had just started teaching Japanese at the same university as the principal investigator. She received training based on the protocols developed with the previous two Japanese instructors before scoring the reflection responses, resulting in an inter-rater reliability of 85%.

Technology-Enhanced Assessment Features

The *reading to learn* tests were provided online through a technological platform developed specifically for this project. The platform afforded different benefits to the participants, the teachers involved in scoring, and the test scorers. For students, the technology-enhanced assessment provided hyperlink dictionary glosses that offered quick English translations of less frequent words in the passages. In addition, students were encouraged to use an online Japanese dictionary to aid with comprehension or writing their responses in Japanese. For teachers and test scorers, the technology highlighted rhetorical patterns within students' reflection responses that indicated areas where they stated prior knowledge, made comparisons, text references, and other rhetorical moves. This feature helped make the scoring of student responses more efficient (e.g., by highlighting key words and phrases that signal prior knowledge integration). The format allowed them to refer back to the passage while answering comprehension questions.


Figure 2. Screenshot of Technology-Enhanced Reading-to-Learn Test (Overwork)

Comprehension

Instructions: The following passage describes a Japanese perspective about work culture in Japan. Think about how this perspective compares with the culture you're most familiar with.

働き過ぎの日本

米国の会社に転職した日本人ビジネスマンがいた。社員を猛烈に働かせることで有名な会社で、上司はこう述べた。「明日から週6日、1日に12時間ずつ働いてもらいたい。それでいいかな?」。驚いた日本人は「ちょっと待ってください」と言って、続けた。「私ははるばる日本から来たんですよ。それなのにそんなに働かせるなんてあんまりです」。長時間労働に日本人が慣れているわけではなさそうだ。



日本より短めに働き、休みも多めに取る欧州に転職したら、どうなるか。そんな調査が行われた。この調査から、さまざまなことがわかった。たとえば、日本で週60時間働いていた人の多くが、欧州では10時間近く労働時間を減らしたという。また、欧州に長くいればいるほど、日本人以外の友人が多ければ多いほど、日本人は休養を多く取るようになる傾向もあった。朱に変われば赤くなるというわけか。やはり、長時間労働に日本人が慣れているわけではないようだ。この二つの例は、働き方を改めるのは可能だと教えてくれる。

Instructions: Please answer the following questions in **JAPANESE**.

最近の日本人は長時間働くことをどう思っていますか。それはなぜですか。(1 phrase or sentence) English Translation

筆者は日本人の働き方を変えることができると言っていますか。それとも無理だと言っていますか。それはなぜですか。(1 phrase or sentence) English Translation

日本では、働きすぎの影響で、どんな社会問題が起きていますか。(1 phrase or sentence) English Translation

「そんな当たり前のこと」とは、どんなことですか。(1 phrase or sentence) English Translation

「振り返る時間」の意味は何ですか。筆者は、なぜ「振り返る時間」を持ちたいと言っていますか。(2 phrases or sentences) English Translation

English Summary Task
Please summarize passage in **ENGLISH**, including the following contents:

- Theme of the passage
- Perspectives of the author
- Japanese mainstream perspectives (3-5 sentences)

Training Task

Before students took the first *reading to learn* test, they were provided with a “training session” to help familiarize them with the technology-enhanced features of the test and the test format.

The students were provided with a few practice questions to ensure their familiarity with the test features and how to switch between typing in English and Japanese. It also had students fill out a background questionnaire (Appendix F) in order to get a better understanding of their language and educational experiences.

Student Feedback

A feedback survey was designed to collect information about the difficulty and usefulness of the reading to learn tests (Appendix F). In addition, the survey was designed to find out about students' familiarity with integrated reading and culture-learning activities. In addition, students were given the chance to provide short, optional feedback at the end of each *reading to learn* test

by providing an answer box under the question, “We would appreciate any comments or suggestions you have about the activity” on the last page. Since there was not enough time for all participants to fill out the full feedback survey after they took the *reading to learn tests*, the full feedback survey was only sent to students within one of the universities with which the principal investigator was affiliated a few days after they took the second test.

Data Collection Procedure

Data collection took place during the beginning and end of the Fall 2017 semester. During the third and fourth week of classes, the principal investigator attended sections of the intermediate and advanced Japanese courses at the four universities in order to recruit participants and explain the overall goals of the *reading to learn* research tasks. Then, during the second or third week of the semester, students were asked to complete the training session from their own computers 1-4 days before taking the first *reading to learn* test. The training task took an average of 30 minutes. Participants later met the researcher in a computer lab during both *reading to learn* assessments. To adapt to university students’ busy schedules, the second *reading to learn* test was administered 8 weeks after the first *reading to learn* test. Both tests took an average of 1.5 hours for students to complete. To reduce possible influences of instruction between the first and second administration of the tests, the test versions were counterbalanced for test topic (Global and Overwork) and treatment (scaffolding or no scaffolding), as shown in Table 3. Students were randomly assigned to one of four “test packages” of the *reading to learn* tasks (Table 3). Students who took the control versions of the test in the first administration took the treatment version during the second administration and

vice versa. Likewise, students who received the Global test during the first administration received the Overwork test during the second administration.

Table 3. Data Collection Procedure within Target Program

	Test Package			
	1	2	3	4
First Admin	Global <i>No scaffolding</i>	Overwork <i>Scaffolding</i>	Global <i>Scaffolding</i>	Overwork <i>No scaffolding</i>
Second Admin	Overwork <i>Scaffolding</i>	Global <i>No scaffolding</i>	Overwork <i>No scaffolding</i>	Global <i>Scaffolding</i>

Data Analysis

To answer the first research question, “Can scaffolding enhance learners’ ability to activate prior knowledge for personal-meaning construction?” students’ constructed responses in the *Reflection* section were analyzed for prior knowledge activation among each test condition. Prior knowledge activation was operationalized as any instance where students referred to relevant prior knowledge in their reflection responses. Prior knowledge references were coded by clauses in student responses reflecting prior knowledge of students’ own culture or personal experiences. A coding scheme was developed to deal with clauses that were harder to categorize as prior cultural knowledge versus evaluation (Appendix H). Also, a second bilingual speaker of English and Japanese was hired as a second coder for prior knowledge references. After 1-2 training and discussion sessions, inter-rater reliability was 99% for the coding of prior knowledge references. The number of prior knowledge references was then compared in the scaffolding and no scaffolding conditions. Table 4 displays each construct measured, the corresponding task, and their method for scoring.

Table 4. Constructs and Tasks

Construct	Task	Measurement	Scoring
Language Proficiency	Japanese Language Proficiency Test	Multiple Choice Score	# of correct responses
L2 Higher-order Thinking Skills	<i>Reading to learn</i> Test	Reflection Responses (<i>Total Score</i>)	Rubric-based rating scores
Prior Knowledge Activation	<i>Reading to learn</i> Test	Number of Prior Knowledge References	Human coding (frequency)

To answer the second research question, “Does prior knowledge activation enhance the learners’ ability to express knowledge refinement?” students’ scores on the reflection sections of the test were examined. A second rater was hired to score students’ performance on the reflection section of the test and demonstrated 85% inter-rater reliability with the principal investigator. Next, the Global test and Overwork versions of the tests were compared to make sure that one passage was not significantly more difficult than the other one to score well on. Multiple pilot tests, item analysis, and assessment revisions were conducted to ensure that the two versions induced the focal skills similarly before the final data collection. Due to careful test design and multiple piloting attempts, it was designed so that the Global test and Overwork passages would elicit similar score averages and variation.

It was hypothesized that a strong relationship would exist between prior knowledge integration and knowledge refinement, but that language proficiency would moderate this effect. After confirming that the two test passages were of equal difficulty, the correlations between students’ integration of prior knowledge and reflection scores were examined. To determine the influence of each variable, a hierarchical regression was run.

Related to the second question, the third research question investigates, “Does language proficiency affect the extent and way in which the learner incorporates conceptual scaffolding in

the L2 reading processes?” To investigate this, bivariate correlations and hierarchical regression from question 2 were used to determine the relationship between linguistic proficiency and the reflection scores on the *reading to learn* test. Based on a pilot study, it was hypothesized that language proficiency would be the strongest predictor of students’ reflection scores, since text-based comprehension and productive language ability relies heavily on linguistic knowledge for meaning extraction and communication.

CHAPTER 4

Results and Discussion

Descriptive Statistics

The sixty-six participants who completed both *reading to learn* assessments demonstrated a wide distribution of scores on all measurements. After data collection was completed, it became clear that some learners wrote longer reflection responses than others, despite the fact that the assessment was not timed and instructions indicated that students should write 4-6 sentences for each response. Since some students were more verbose than others in their reflection responses, it was considered important to include this factor in the analysis. Descriptive statistics for the comprehension section, reflection section, number of prior knowledge (PK) references, Japanese Language Proficiency Test (JLPT), and total response length of students' reflection responses are shown in Table 5.

Table 5. Descriptive Statistics based on Condition

Condition	Comprehension Score		Reflection Score		PK References		JLPT		Response length (characters)	
	M	SD	M	SD	M	SD	M	SD	M	SD
+ Scaffolding	5.78	1.31	22.22	6.87	5.00	2.63	NA	NA	545.53	183.2
- Scaffolding	5.66	1.45	21.97	6.24	5.74	3.26	24.44	8.01	559.33	170.0

Note: PK = prior knowledge

Table 6. Reflection Scores Based on Time and Condition

Condition	Time 1		Time 2	
	M	SD	M	SD
+ Scaffolding	21.33	7.55	23.06	6.15
- Scaffolding	21.90	6.25	22.05	6.34

Interestingly, learners showed a difference in prior knowledge activation during the first time of administration, but less so during the second time of administration, which may be due to practice effects (Table 7).

Table 7. Prior Knowledge References Based on Time and Condition

Condition	Time 1		Time 2	
	M	SD	M	SD
+ Scaffolding	6.15	3.46	5.31	3.03
- Scaffolding	4.88	2.61	5.12	2.67

Correlations were also examined between each measurement. As expected, there were strong correlations between comprehension scores, reflection scores, and the JLPT. Prior knowledge references had no correlation with the comprehension scores or JLPT, but they exhibited a medium correlation with response length (Table 8). In addition, response length showed a strong correlation with reflection scores and a medium correlation with comprehension scores.

Table 8. Correlation Matrix

	Reflection	JLPT	PK References	Length
Comprehension	0.42*	0.56*	0.02	0.30*
Reflection	-	0.39*	0.45*	0.79*
JLPT		-	0.04	0.34*
PK References			-	0.46*
Response Length				-

Note: * indicates significance at $p < 0.001$

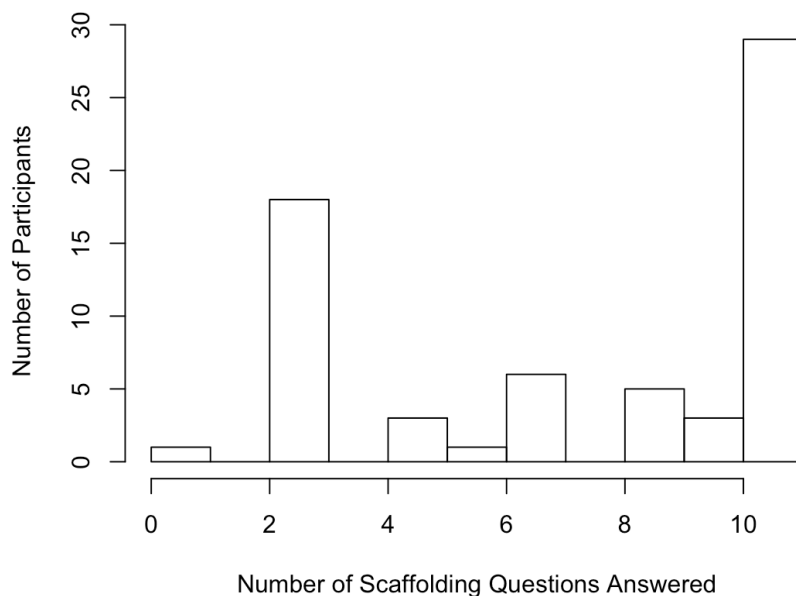
Students spent approximately the same amount of time on the analysis section of the scaffolding condition and the vocabulary section of the non-scaffolding condition, although there was wide variation among learners, as indicated by the standard deviations (Table 9). A Welsh's paired *t*-test indicated that students did not spend significantly more time on one section than another. During the second time of administration, participants spent a bit less time on both sections.

Table 9. Time Participants Spent on the Analysis and JLPT Sections

	Time 1		Time 2	
	M	SD	M	SD
Analysis Section (+ Scaffolding)	20.99 min	8.57 min	15.86 min	8.83 min
JLPT Vocabulary Section (- Scaffolding)	20.79 min	10.09 min	17.45 min	7.65 min

About one third of participants completed the entire scaffolding section during the treatment condition of the *reading to learn* test. However, another third only completed the open-ended cultural analysis questions and another 20% partially filled out the comparison chart to varying degrees of completion as shown in Figure 3. This information was important to consider when analyzing the effect of the scaffolding condition on learners' prior knowledge activation.

Figure 3. Amount of Scaffolding Completed in Treatment Condition



Note: students only received scaffolding for one of the tests. For the other test, they received vocabulary questions. $K = 11$.

In order to confirm that passage features did not have any notable impact on students' performance, Welsh two sample paired t -tests were conducted between students' scores on the Overwork and Global passages. The paired t -test confirmed that students gained similar reflection scores on both passage topics t -test ($t(130) = -0.48, p = 0.63$), and made approximately the same amount of prior knowledge references on the overwork and global passages ($t(130) = 0.49, p = 0.62$). These results justified removing passage topic from subsequent analyses as a possible factor influencing *reading to learn* scores.

Table 10. Descriptive Statistics based on Passage Topic

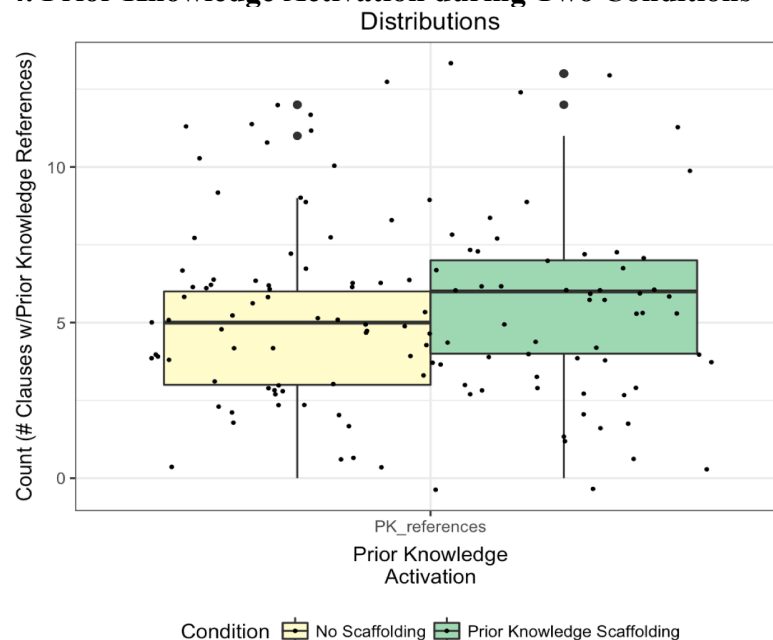
Passage	Reflection Score		Prior Knowledge References	
	M	SD	M	SD
Global	21.82	6.46	5.50	3.37
Overwork	22.37	6.65	5.24	2.53

Research Question 1

During the *reading to learn* process, can scaffolding enhance learners' ability to activate prior knowledge for personal-meaning construction?

Contrary to the hypothesis, descriptive statistics did not indicate any noticeable differences between scaffolding and non-scaffolding conditions on the reflection scores. This remained true, even when compared across time of administration, as shown in Table 6. However, learners averaged slightly more prior knowledge references in the scaffolding condition during both time administrations, especially during Time 1 (Table 7). These differences were taken as justification to further examine differences on the data based on Condition using inferential statistics. Figure 4 displays each participants' number of prior knowledge references during each condition, and displays a wide distribution of prior knowledge activation in both conditions.

Figure 4. Prior Knowledge Activation during Two Conditions



Note: The center line within the boxplot represents the median, while the edges of the box represent the upper and lower quartiles. The bold dots towards the top of the chart indicate outliers.

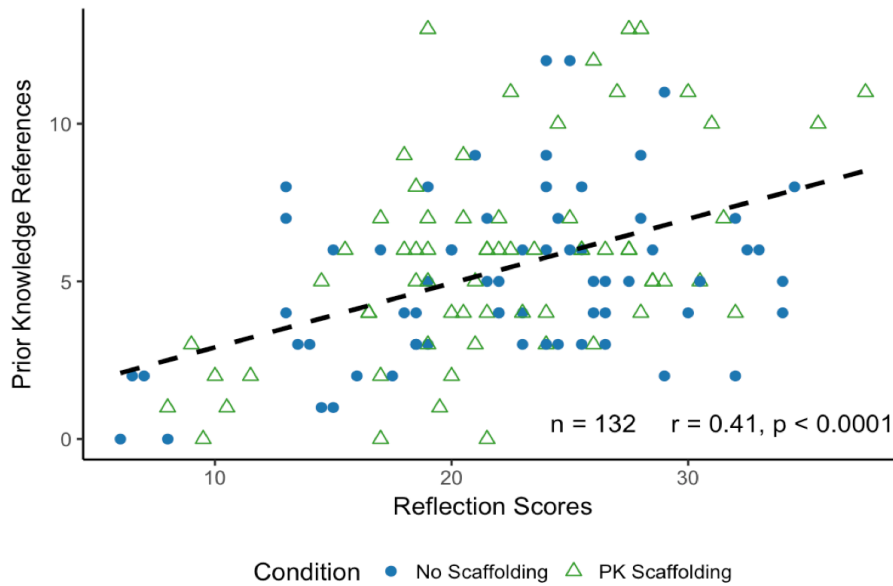
A paired Wilcoxon Signed-Rank test indicated that the difference between the medians was statistically significant ($W = 810$, $Z = 5.53$, $p < 0.001$, $d = 0.68$, $p < 0.001$). However, Figure 4 clearly shows that even though it is statistically significant, the difference between the median of the non-scaffolding Condition (Med = 5) and the scaffolding Condition (Med = 6) is small. More notable is that fact that within the non-scaffolding condition, learners showed a wide distribution of prior knowledge activation. This seems to indicate that for some learners, prior knowledge scaffolding is not necessary, as they are able activate prior knowledge on their own.

Research Question 2

Does prior knowledge activation enhance the learners' ability to express knowledge refinement?

While reflection scores were not significantly different between the control and treatment conditions, a Spearman's Rho correlation indicated a medium-size relationship between the number of prior knowledge references and reflection scores on all tests, regardless of condition ($r(130) = 0.41$, $p < 0.0001$). The relationship between the two constructs can also be seen in Figure 5.

Figure 5. Reading-to-Learn Test Scores and Prior Knowledge Activation Correlation Plot



To investigate the ability of prior knowledge activation to predict reflection scores when response length and language proficiency was controlled for, a hierarchical regression was performed. Because the number of prior knowledge references was treated as ordinal data (e.g., akin to a Likert Scale), these data were first categorized into a smaller number of rankings using cluster analysis. A cluster analysis revealed four rankings of “prior knowledge activation,” which was assigned to each test score.

Length of students' reflection responses were entered first since bivariate correlations indicated a strong correlation between the two (Table 8). This was followed by language proficiency and the number of prior knowledge references. Condition was not included in either model since it had no statistical influence on reflection scores. Before running the regression, various assumptions were checked: all variables showed normal distributions and homoscedasticity, and three outliers were identified and removed from the data. In addition, all variables were checked for collinearity using a variance inflation factors test, which indicated that no variables were collinear.

Table 11. Predicting Knowledge Refinement Scores with Hierarchical Regression

Step	Variable	Adjusted R ²	R ² change
1	Response length	0.666*	
2	JLPT	0.692*	0.026*
3	Prior Knowledge References (all clusters)	0.738*	0.046*

Note: * indicates significance at $p < 0.001$

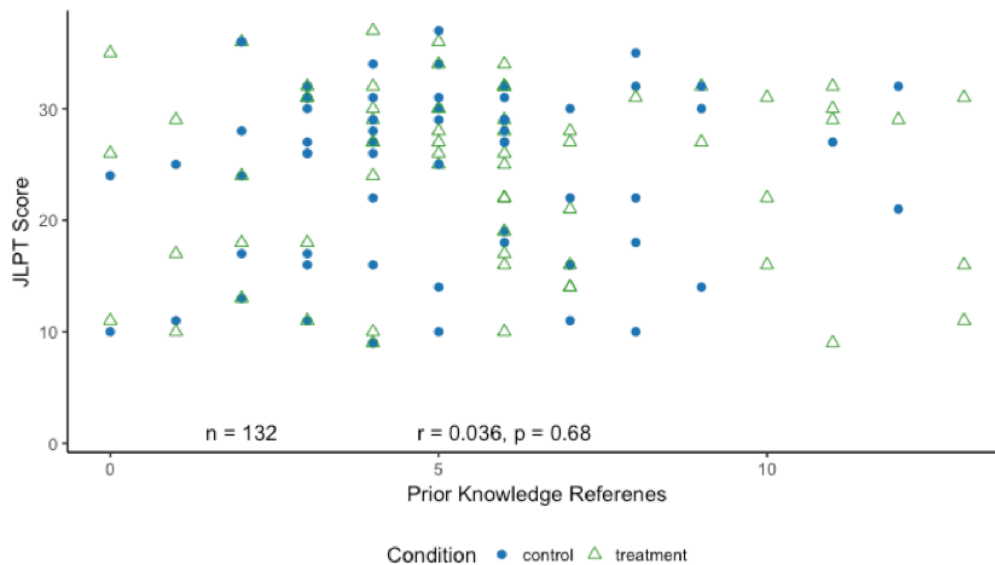
The hierarchical regression indicated that all three variables, response length, language proficiency, and prior knowledge references significantly predicted 73.8% of the variance in response scores ($F(123) = 69.8$, $p < 0.0001$) (Table 11). Response length accounted for 66.6% ($t(123) = 12.26$, $p < 0.001$) of reflection scores, language proficiency explained 2.6% ($t(123) = 3.52$, $p < 0.001$), and all prior knowledge clusters together explained an additional 4.6% of the variance in reflection scores (cluster2: $t(123) = 3.08$, $p < 0.003$; cluster3: $t(123) = 4.27$, $p < 0.001$; cluster3: $t(123) = 2.80$, $p < 0.001$).

Research Question 3

a. Does language proficiency affect how much the learner activates prior culture knowledge?

b. Does language proficiency affect learners' ability to express knowledge refinement?

To investigate the impact of language proficiency on prior knowledge activation, another correlation test was run. Notably, a Spearman's Rho test revealed no significant correlation between students' JLPT scores and the number of prior knowledge references made in their reflection responses ($r(132) = 0.036$, $p = 0.68$), as seen in Figure 6.

Figure 6. Language Proficiency and Prior Knowledge Activation

However, as indicated in the hierarchical regression, language proficiency was a significant predictor of students' reflection scores ($t(125) = 3.95, p < 0.001$), explaining 2.6% of uniquely explaining the variance. An important question to consider is the role of language proficiency in response length. Response length may be a partial indicator of writing fluency, but it may also be an indicator of individual differences in motivation, since the test was not timed. Since response length predicted most of the variance in students' reflection scores ($t(125) = 11.94, p < 0.001$), this is an important question to examine, which is attempted in the following section.

Qualitative Examination of Four Learner Responses

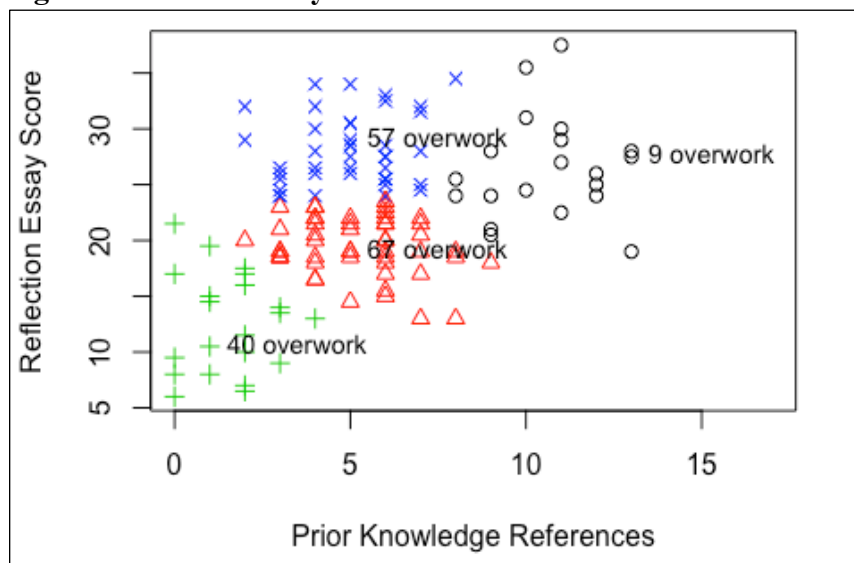
To help understand results of the quantitative analyses, this section examines four learners' responses for how they interacted with the prior knowledge scaffolding, activated prior knowledge, and expressed knowledge refinement within the overwork version of the test. It begins by describing how the four representative learners were selected from the participant pool

and the extent to which they represent the data. It then examines their interaction with the scaffolding itself, followed by an analysis of their responses to the reflection questions, where they express their knowledge refinement.

Cluster Analysis

To select participants who represent different scoring patterns within the data, a cluster analysis was performed using the Hartigan and Wong (1979) method. The analysis revealed four clusters, representing four different ways students tended to perform on the reflection section (Figure 7). Descriptive statistics for each cluster are shown in Table 12.

Figure 7. Cluster Analysis Plot



Note: Labels are located to the right of the observed value.

Table 12. Descriptive Statistics of Clusters

Cluster	Reflection Score		Prior Knowledge References		JLPT	
	M	SD	M	SD	M	SD
1	12.60	4.49	1.52	1.17	19.05	8.52
2	19.46	2.57	5.22	1.61	24.66	7.42
3	26.48	4.65	10.60	1.60	24.30	8.52

4	28.04	3.13	4.98	1.49	27.00	6.95
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The first cluster represents learners who scored low on the reflection section and made the fewest references to prior knowledge. The second cluster scored slightly higher on reflection while incorporating more prior knowledge references. The third and fourth clusters were the highest scorers on the reflections, but the fourth cluster integrated more prior knowledge references on their reflection responses than the third cluster.

One learner was selected from each of these clusters (as shown in Table 13 and Figure 7) based on their representativeness of their cluster. The only exception is Participant 9, who made more prior knowledge references than others in Cluster 3.

Table 13. Case Participants

Cluster	Participant	Reflection (Total Score)	Prior Knowledge References (Total)	JLPT Score
1	40	10.5	1	10
2	67	19.0	5	34
3	9	27.5	13	11
4	57	29.0	5	30

The next section examines each of the four learners' responses to the scaffolding condition of the test. In doing so, we can better understand where the scaffolding successfully (or unsuccessfully) prompted students to activate their prior knowledge, which may help explain why the differences between the scaffolding and nonscaffolding conditions were so small.

Analysis Section: Learners' Interaction with Scaffolding Task

The Comparison Chart. While learners activated significantly more prior knowledge in the scaffolding condition, the difference was small, amounting to approximately 1 more reference in the treatment condition on average. One possible reason the scaffolding was not as effective as anticipated was because half of the activities within the scaffolding were optional. Namely, the comparison chart was made optional because of time constraints, as the test took an average of 1.5 hours for students to complete. Consequently, 20 of the 66 participants did not fill out the chart at all, while 16 wrote answers to 10-50% of the questions (Figure 3). This is also reflected among the four case learners, as Participant 40 and 57 did not fill out any parts of the comparison chart (Table 14).

Table 14. Analysis Scaffolding: Optional Comparison Chart

Q1a. 長時間労働と心のゆとりとどんな関係がありますか。

“What type of relationship exists between overwork and time for reflection?”

Participant	Japanese Culture	Own Culture
40	(No answer)	(No answer)
67	心のゆとりがなくなってもいい。 It is okay not to have time to reflect.	心のゆとりがなくなっても、体が できたら大丈夫。 Even if there is no time to reflect, it's okay if your healthy.
9	While working long hours is difficult for one's social life, it fulfills their business life. <i>(Answered in English)</i>	Working overtime isn't necessary unless it involves extra pay and/or a deadline is close. <i>(Answered in English)</i>
57	(No answer)	(No answer)

Q1b. 社会にとって長時間労働の良い影響は何ですか。

“What are the positive influences of overwork on society?”

Participant	Japanese Culture	Own Culture
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40	(No answer)	(No answer)
67	会社をよくして、自己価値を実現する。 You improve your company and make yourself valuable.	お金を稼いで、家族の生活をよくする。 You earn money and make a better living for your family.
9	Satisfaction when business goes well, impressing superiors. <i>(Answered in English)</i>	Finishing work, extra pay. <i>(Answered in English)</i>
57	(No answer)	(No answer)

Q1c. 長時間労働には、どんな社会問題が関連していますか。
“What societal problems are related to overwork?”

Participant	Japanese Culture	Own Culture
40	(No answer)	(No answer)
67	過労や違法な長時間労働が関連している。 It is related to extreme overwork and illegal long work hours.	同じ、さらに違法な会社も関連している。 Similar, and related even more to illegal companies.
9	Overtime work is hard on the health of an employee. <i>(Answered in English)</i>	People are unable to have relationships with others, and take much needed breaks/vacations. <i>(Answered in English)</i>
57	(No answer)	(No answer)

Among those who did fill out the comparison chart, it is interesting to note what types of prior knowledge participants activated. As intended, Questions 1a, 1b, and 1c prompted P40 and P57 to make generalizations about Japanese culture and their own culture, rather than to talk about specific personal experiences. Notably, these types of generalizations were also prolific in their reflection responses, which was problematic if the students reproduced negative stereotypes

about Japanese people. This is discussed later during the analysis of students' reflection responses.

Open-ended Cultural Analysis Questions. The open-ended section elicited different amounts of prior knowledge activation depending on the question. Question 1 in particular appears to have elicited more prior knowledge activation than other questions.

Table 15. Analysis Scaffolding: Open-ended Question 2

Participant	Response
Q2.あなたの国では、長時間働くことが大切だと思われていますか。(はい・いいえ) 例 を使って説明してください。(1-3 sentences) “In your country, is it considered important to work long hours? Please explain using an example.”	
40	<p>まあ、人や場合によって違うでしょう。いいとおもっている人といやだとおもっている人がいると思います。社員は長時間働くことがいやだとおもってて上司はいいとおもっているだろうと思います。</p> <p>Well, people are different depending on the situation. I think there are people who think it is good and people who think it's bad. The employee thought overwork was bad and the boss thought it was good.</p>
67	<p>いいえ、私の国では、たぶん給料がもらえば、長時間働きたくありません。自分の責任の限界でサボります。</p> <p>No, in my country if we receive a salary, then probably we don't work long hours. When we reach our limit of responsibilities, we loaf off.</p>
9	<p>アメリカでたくさん働くのはあまり重要じゃないです。時々人々は残業をしますが、いつももっと高い賃金のをもらえますから。アメリカの文化の一人のことは一番重要なことですから、会社のために何かをしません。</p> <p>In America, working overtime isn't very necessary. Sometimes people overwork, but that's because they always receive higher pay. In American culture, people place importance on themselves as individuals, so they don't do anything for the company.</p>

- 57 いいえ、アメリカでは長時間働くことが大切だと思われていませんだと思います。例えば、ある夫は働き過ぎたら、自分の妻が怒ると思います。なぜなら、多くの妻が家族のみんなと時間を過ごしたいからです。
No, I don't think overwork is considered important in the U.S. For example, if a husband works too long, I think his wife will get mad. This is because many wives want to spend time with their whole family.

P40 attributes need for change to differences between each person without acknowledging any influence from culture or personal experiences. Meanwhile, P67, P9, and P57 all answer the question about their own culture and support their answers with prior knowledge of their own culture. However, P9 and P57 provide more elaboration in their responses. It is also interesting to note that among all prior knowledge scaffolding questions, Question 1 was the most effective at activating learners' prior knowledge about their own culture. Although a portion of responses were similar to P40, it appears that not only directing students' attention to their own country, but also requesting an example can be an effective way to guide students to activate knowledge of their own culture's values, and possibly if they have any personal experiences that reflect those values.

Table 16. Analysis Scaffolding: Open-ended Question 3

Q3. あなたの国・社会も働き方を改めることが可能だと思いますか。それはなぜですか。(1-3 sentences) : Does your country have the potential to change its views toward overwork? Why or why not?	
Participant	Response
40	<p>米国では働き方を改める必要はないだろうと思います。仕事をしている時間はたいてい一種間で40-50時間しかないからです。 In the U.S., I don't think we need to reform our way of working. This is because normal work hours are usually only 40-50 hours a week.</p>

- 67 はい、今の社会は、人々の責任感は足りないと思います。教育をよくしたら、改めるかもしれません。
Yes, in today's society I think people lack a sense of responsibility. If we improve education, then we can change.
- 9 時間が経つとアメリカはもっともってアジアの働くの傾向は同じになれると思います。アジアが一番大きいライバルだから、同じペースにならなくて行けません。As time passes, I think U.S. work practices may more and more resemble Asia. Asia is the largest rival, so the U.S. has to keep up pace.
- 57 アメリカで働き方を改めることが可能だと思います。なぜなら、ほとんどのアメリカ人は不当なことを気付ければ、変わるまでずっと文句を言ったら頑張ったりすると思います。
I think in the U.S. it is possible to reform the practice of overwork. This is because if Americans notice something unjust, almost everyone will keep complaining and doing their best until it changes.

P40 displays prior knowledge activation when they state that there is no need for change because Americans usually only work 40-50 hours a week. P67 seems to activate prior cultural knowledge about their own society lacking responsibility, although may be slightly overgeneralized. P9 did not directly answer the question, but implies that the US will change in the direction of Asia, activating prior knowledge of U.S.'s desire to compete with Asia. P57 also activates prior cultural knowledge by referring to how American's will complain if they see something unjust.

Overall, it appears that Question 2 activated a small amount of prior cultural knowledge from each learner, but responses lack elaboration on their reasoning (replying to "Why" statements). In addition, P40 and P67's statements are slightly overgeneralized. While P40 has an acceptable response, it appears less reflective since they did not recognize situations where overwork *does* exist in their own country; for example, within their own life as a university

student. P67 states that people in their culture lack responsibility, but it is not clear what they lack responsibility towards. P9 implies reflection on the U.S. as a global economic power, but does not mention this explicitly. Overall, P40, 67, and P9 answers all show some activation of students' prior knowledge about their own culture, but with little elaboration or explanation of their reasoning. If we want prior knowledge scaffolding to be more effective, questions may need to be more explicit in asking students to elaborate in their responses. Question 1 appears to have elicited more elaboration because it asked for a specific example. However, students who have trouble thinking of a relevant example might need extra scaffolding, such as a list of companies, recent events, or community subcultures related to the topic, to help activate existing schemata within students' memory.

Table 17. Analysis Scaffolding: Open-ended Question 4

Q4. あなたは、労働環境を「振り返る時間」は大切だと思いますか。なぜですか。(1-3 sentences)

“Do you think that people working in your country value having time to reflect? Why or why not?”

Participant	Response
40	<p>人によって違うでしょう。私は大切だと思いますけどほま¹の人はどう思っているか分かりません。</p> <p>Depending on the person it's probably different. I think it's important, I don't know how others¹ think.</p>
67	<p>はい、労働環境が悪くなったら、社員は楽しくないしい²、仕事の効率が悪いしい。悪性事件になるかもしれません。</p> <p>Yes, if working conditions get bad, then the employees won't have fun and their efficiency will be poor. It will become a bad event.</p>

- 労働環境を「振り返る時間」は大切だと思います。日本は特にこの問題についてどうすればいいかを考えないと何も変わらないと思います。日本人は過労死しないように頑張らないといけないと思います。
- 9 I think it's important to have time to reflect in the work environment. Especially for Japan, if they don't think about what to do about this problem then nothing will change. Japanese people have to do their best so they don't commit suicide due to overwork.
- 私は大切だと思いますから、たぶんアメリカ人のみんなは振り返る時間がないのはダメだと思います。
- 57 I think it's important, so probably all Americans think it is bad if they don't have time to reflect.

Note: ¹「ほま」 is a typo made by the student of 「ほか」 ('other'), ²「楽しくないしい」 is a typo made by the student. The correct form is 「楽しくないし」 ('not fun')

Although Question 4 asks students to express a personal opinion about their own country, students tended to use logical reasoning to support their opinion, rather than prior knowledge of their own culture or personal experiences. It is a positive sign that P40 recognizes diversity within cultures, but does not reflect on what personal experiences, cultural values or practices might have influenced their perspective. P65 gives a logical reason that can be applied to any culture, while P9 guesses that most Americans feel the same way as they do. P9 comes the closest to activating knowledge about her own country's values and practices, but does not go the extra step to explain what may influence those cultural values.

In response to Question 4, the majority of participants used logical explanations to support their opinions instead of reflecting on personal experiences or cultural knowledge. This is important to note, since it may have influenced the types of responses they gave in the reflection section.

It is interesting to note that in the four case examples, we see little overlap in the ideas expressed in the scaffolding section and reflection responses, presented in the next section. It is possible that students felt that they should have different answers to each section of the task.

Phrases such as 「前もう言いましたけど、…」 (‘I already said this but . . .’), were present in some of the reflection responses, and several of the student feedback responses stated that the questions seemed to overlap with each other, suggesting learners felt awkward repeating themselves. It is also possible that students simply did not remember what they wrote in the scaffolding section. While administering the assessment, several participants asked if it was possible to look back at their answers to the scaffolding section. Unfortunately, limitations in the current version of the technology-enhanced assessment made it impossible for them to do so in the current version of the assessment.

Reflection Responses: Learners’ Expression of Knowledge Refinement

Students expressed more knowledge refinement on their reflection responses when they displayed higher-order thinking skills (HOTS), as these were the highest-weighted skill areas in the scoring rubric (Appendix E). In the following sections, learners’ answers to two questions are examined in order to understand how response length, language proficiency and prior knowledge integration played a role in learners’ reflection scores.

Japanese Culture

The first two reflection questions asked students to reflect on what they learned about Japanese culture. Their scores were heavily weighted on the *Learn*, *Relationship*, and *Diversity* sections of the rubric (Appendix E). The *Learn* section of the rubric aligns with the Communication objective of ACTFL’s National Standards (Standards 1.2 and 1.3), where students present their understanding of the text and what they have learned to an audience. In this section, students were awarded more points when they gave evidence or explanations to support their statements about what they learned. However, if participants lacked a clear focal

point about ‘what they learned’ or accompanying information had lacked a clear connection to their focal point, then they were not awarded full points. In Table 18, P40 only received 1 point for the *Learn* score because they answered that they did not explain which Japanese views they learned “a little bit” about, and did not elaborate by explaining what they already knew. P67 received 3 points (a full score) for the learn section of the rubric, as they explained a focal point (Japanese people are not used to overwork) and two ideas that support this statement (It is hard for Japanese people to object to overwork and Japanese people who moved to the West reduced their work hours). P9 and P57 only received 2 points on the learn section of their responses because they only mentioned one fact from the text to elaborate on what they learned. The other information they mentioned was not considered relevant to the *Learn* score because it was not related to their focal point, and consisted of information they did not receive from the text, and considered more relevant to other parts of the scoring rubric. Overall, participants’ *Learn* score was impacted by their ability to construct personal-meanings from the text and elaborate on them with clear explanations or examples.

Table 18. Reflection Question 1

Q1. 本文をもとに日本人の長時間労働の考え方についてどんなことが分かりましたか。例を使って説明してください。(4-6 sentences) From the passage, what new insights have you gained about Japanese people’s attitudes towards overwork? Please explain using an example.		
Participant	Response	Total Pts

-
- 40 これを読む前に日本人の長時間労働の考え方はよく分かりませんでした。今少ししか分からないけどちょっとだけ覚えしました。日本人には仕事する時間が多いそうだったがそんな¹にひどくなって知りませんでした。 4
- Before reading, I didn't really understand Japanese people's view towards overwork. I only know a little, but I learned only a bit. It seems that Japanese people have a lot of work hours, but I didn't know it was that¹ bad.
- 67 日本人も長時間労働に慣れていないことがわかりました。ただ働かせすぎた時、驚いても、抗議しないことにしています。そして日本人の働き方は改めるます²。欧州に転勤した日本人は労働時間を減らしましたから。 4.5
- I learned that Japanese people are also not used to overwork. It's simply that when they do have to overwork they don't object. Also, overwork can be reformed². Because Japanese people who transferred to jobs in the West reduced their work hours.
- 9 私はいつも「日本人は残業をしなくてはいけませんと思う」と思いました。でも、やっぱり違うな日本人がいます。日本で振り返る時間はも大切だから、もっともっとアメリカみたいになりました。まだ上司のためにいつかのものをしなくてはいけませんですが、そんなことはアメリカにもあります。でも、日本はもっと自分のことは重要になりました。それでよかったと思います。 8.5
- I always thought 'Japanese people think they have to do overwork.' But apparently there are other types of Japanese people. In Japan, time for reflection is important, so they became more and more like the U.S. They still have to do things for their boss, but that kind of thing also exists in the U.S. But Japan came to value themselves as individuals more. I think that is good.
- 57 本文をもとに日本人の長時間労働の考え方について多くの日本人は我慢して、休暇を多く取るように長時間で働きます。例えば、会社員と仲が良くなるように長時間で会社にいることにします。しないと、会社員はすぐに判断するかもしれません。朱に交われば赤くなるということのようです³。 7.5
- Based on the text, many Japanese people do their best to work long hours so they can take a vacation. For example, to get along better with co-workers they overwork and stay at their company. If they don't, their co-workers might judge them. It seems that 'those that keep company with the wolf learn to howl.'³
-

*Note: ¹ typo of [そんな] ('that'), ² type of 「改めます」 ('reform'), ³ The literal meaning of this idiom is 'Those who mix with cinnamon turn red,' meaning that people tend to imitate those around them.

The *Relationship* section of the rubric aligns with the *Cultures* objective of ACTFL's National Standards (2.1), where students display their understanding of relationships between cultural perspectives and practices. They received one point for noting a relationship already stated within the text, another point for describing a relationship beyond the text, and a final point for elaborating on this relationship. P40 received 0 points for this section, P67 received 1 point, and P57 and P9 received 2 points. P9 received 2 points because they described a relationship between the practice of overwork and the value of having time for reflection, described within the text. In addition, P9 also noted the relationship between overwork and the cultural value of respecting hierarchical relationships. P57 also implied relationships between practices of overwork and values of group harmony with some extra detail. However, both P9 and P57 were not rewarded a third point because they did not explain the relationship in adequate detail. P9 stated that the individual is more important, but did not explain how or provide an example from the text. The extra information they provided related to their overall their last sentence was related to group harmony or overwork. P57 stated that a person might be judged by their co-workers if they do not work overtime, but also failed to go the extra step to explain by providing detail or with an example. In both cases of P9 and P57, it seems that learners' ability to earn full points on the *Relationship* section was also limited by their ability to elaborate on their points with a clear explanation or example. This may explain why response length was such a strong predictor of learners' scores.

For the first two reflection questions, students were also scored on their ability to recognize a *diversity* of views within Japan. They received 1 point if they mentioned diversity

among Japanese views on the issue, 2 points if they used an example to explain it, and 3 points if they had more than one example to explain the diversity of views. Most students received 0 or 1 points for this section, as most students could only talk about differences between mainstream Japanese views and the Japanese authors' views, which contrasted in both the overwork and global passages. Admittedly, this question was probably too difficult, as we could not expect students to know about other Japanese viewpoints about the topic and be able to give examples. However, it was important for students to support their understanding with examples from the text, as we did not want students making unqualified generalizations about Japanese culture. Future rubrics might clarify the importance of qualifying statements made about different cultures, particularly when the culture is not your own.

Own Culture

For the second two reflection questions, students were asked to reflect on their own culture and views towards the societal issue presented. Table 18 displays learners' answers to Reflection Question 3.

Table 19. Reflection Question 3

Q3. 本文の情報はあなたの長時間労働に対する考え方にどのように影響しましたか。 例を使って説明してください。(4-6 sentences) How has information from the passage influenced your attitudes and thoughts towards overwork? Please explain using an example.		
Participant	Response	Score
40	私は前からいやだと思います。これを読む後でそれはかえらな い。かえるはずがないでしょう。だれがこれを読む後でいいとお もってうかでしょうか。 I thought it was bad from before. After reading this that doesn't change. There is no reason it should change. Who would think it is good after reading that?	2.0

- 長時間労働が好きな人はやはりいないと思います。できれば、労働時間を短くしたいです。日本人は働きすぎることでも有名ですが、欧州に転勤して、労働時間を減らしました。
- 67 In the end, I don't think there is anyone who likes overwork. If possible, I want to shorten my work hours. Japanese people are famous for working too much, but if they move to the West, they decreased their working hours. 2.5
- 今から私は残業はいつも悪いだと思います。本当に友人を作るし、休みを取るのは大切です。そして、60時間働くのはもちろん無理です。私の姉は弁護士で、いつも会社や家にも働いています。私はそれがきらいです。姉はいつも働くのせいでたくさん圧力があります。日本の会社員はたぶん同じだと思います。それはダメです。
- 9 From now on I will only think that overwork is wrong. It's really important to make friends and take breaks. Also, working 60 hours is of course impossible. My sister is a lawyer and is always working at her company and at home. I hate that. Because of work, my sister always has a lot of pressure. Japanese employees are probably the same. That is bad. 5.0
- 本文の情報のせいで長時間労働は決して必要なことだとは思いません。お金を作ったら、会社員と仲良くなったりするのは大事だと思いますけど働き過ぎて、自殺する人は本当にかわいそうだと思います。例えば、本文に日本で週60時間働いていた人の多いと書いてあって、私には多くの日本人は無理してると 생각합니다。家族と時間を過ごしたり、趣味もしたりする時間があることも大事だと思います。
- 57 Because of the information in the passage, I don't think overwork is absolutely necessary. I think it's important to make money and have good relationships with your co-workers, but I feel sorry for people who work too much and commit suicide. For example, the text mentioned that there are many people who work 60 hours a week, to me Japanese people are ignoring it (unclear meaning). Spending time with family and having time to pursue hobbies is also important. 8.0
-

P40 does not use any text information or references to their own culture to support their answer, which is why they were only awarded points for stating what they learned and the

comprehensibility of their answer. P67 did not directly answer the question, but implied that no one in their own culture likes overwork. However, there was no support for this statement and it was not clear how Japanese people changing their work hours in the West related to this conclusion.

For the second two reflection questions, students were awarded points for the *Compare* section of the rubric if they used a comparison between Japan and their own culture to support their conclusions. Students were awarded 1 point for introducing relevant information from their own culture or personal experiences and 2 points if they directly compared it with relevant information from Japanese culture (Appendix E). They were awarded 3 points if they elaborated on the comparison with further explanations or examples. Many students introduced prior knowledge into their responses, but few directly compared the information with Japanese culture, as shown with P9. P9 uses personal experiences about their sister to explain their negative view of overwork, which helped them gain 1 point for *Compare*. However, P9 did not receive more points for *Compare* because they did not introduce information from the text or Japanese culture to directly compare their sister's overwork experiences with a Japanese person. They note that "Japanese employees are probably the same," but does not explicitly support this with evidence from the text. P57 did not receive any points for comparing their own culture to Japan, but did receive full points for *Learn* and *Relationships*. This is because P57 supported the belief that overwork is not absolutely necessary with several qualifications, expressing a more nuanced understanding of the issue. P57 also express understanding of relationships between cultural values of supporting the group and family, freedom to pursue personal interests, and the practice of overwork. While not covered in the scope of this dissertation, P57 also express signs of

empathy for people who suffer from overwork and a capacity to understand Japanese culture through a Japanese cultural lens. This is a strong indicator of intercultural competence.

In summary, students who scored well on the reflection responses tended to provide more evidence or explanations to support their answers, which came in the form of text references, prior knowledge references, or logical reasoning. Meanwhile, students in the same cluster as P9 tended to use of prior knowledge references to support their conclusions, students in the same cluster as P57 were more likely to use text references or logical reasoning to support their conclusions. On the other hand, students in the two clusters who scored lower on the reflection questions were less likely to back up their claims/conclusions with explanations or examples.

Integrated Culture and Language Learning

Students' lack of explanatory clauses and transition phrases was a general theme among low scoring responses. This phenomenon was particularly noticeable when students made overgeneralizations about Japan or their own culture without stating where they obtained the information. This sometimes made it difficult to know whether students were stating 'facts' about their understanding of the world, or 'guesses' about Japanese culture. Participant 74 exemplified this when reflecting on the passage about globalization:

Participant 74: Overgeneralization about Japanese Culture

日本人の英語は大抵悪いでしょう。そして、英語を教えることもまだ上手ません “Japanese people's English is overall bad. Also, they're still bad at teaching English.”

Extreme generalizations about Japanese culture were coded as prior knowledge when they qualified the remark with phrases such as "When I was in Japan" or "My Japanese friend

said . . ." However, P74's statement was not counted as prior knowledge, as it only expressed unwarranted opinions and stereotypes about Japan (Appendix H).

Students made generalizations not only about culture, but other beliefs as well. During these instances, they did not express where their ideas came from, making it unclear if they were referring to prior knowledge, or simply stating their opinion. Participant 22 exemplifies this in their response to the passage on globalization:

Participant 22: Stating an Opinion Without Prior Knowledge Integration

若いうちに学ばきつとこの新世代の子の中に「グローバル人材」がきつと増えるだろう。"If [we] learn [foreign languages] from a young age, then we'll surely have a new generation of global citizens"

P22 did not explain why they think learning a FL from a young age is important or how they came to hold this opinion. We might guess that the first clause is based on prior knowledge, but the student did not reflect on where this assumption came from, whether it be a research paper or their own experience learning a foreign language.

In contrast, some students were skilled at distinguishing "fact" from "opinion" within their responses.

Participant 23: Integrating Prior Knowledge

例えば、筆者さんは外国語を習う前に、母国語を充実させたほうがいいとおもっているが、研究によると、子供の時から外国語を習ったら言語の能力が増えます。"For example, the author states that before we learn a second language it's better to fully develop our first language, but according to research, if we learn a foreign language from the time we are children, our proficiency will increase."

While the Participant 23 may be misinformed about what second language research has concluded about the critical period hypothesis, they use appropriate language to explain where they received the information. As a result, their statement does not sound like an opinion and can be used to support any opinions or conclusions within the same section.

Student Feedback

Because the test was longer and more challenging for students than anticipated, there was not enough time to ask all participants to fill out the feedback survey. Instead, a subset of participants were asked to fill out the feedback survey from the target program, since teachers from this program were willing to send it to their students. In addition, all participants were asked for short, optional feedback at the end of each *reading to learn* test. Each test ended with the statement, “We would appreciate any comments or suggestions you have about the activity.” In response, 34 participants provided short comments on one or both of the *reading to learn* tests (Table 19), for a total of 48 comments. This section first presents the short feedback from the 34 participants, followed by more detailed feedback from the target program survey.

Participants’ responses were categorized based on what type of comment they provided. Eight comments provided suggestions about the test format, such as improving the clarity of the questions, making the test font larger, or providing “I don’t know” options on the vocabulary questions. Four comments were related to technological aspects, as two learners were not very comfortable typing in Japanese and the other two enjoyed being able to use hyperlink glosses or see English translations of the questions. Nine participants comments focused primarily on how difficult the tasks were for them linguistically, some enjoying the challenge while others feeling it was too hard. Finally, twelve comments focused on the content of the test. Seven of them stated how the test challenged their language skills, but that the content and tasks were very

thought provoking. Three of them mentioned that they found the content of the passages very interesting. Two participants mentioned that they did not feel like they could really answer the reflection questions because they had no background knowledge about Japanese culture. It appears that the tests did not successfully orient these learners towards using prior knowledge of their own culture to answer the questions, leaving them feeling inadequate in their knowledge about Japanese culture. Overall, it appears that participants found the *reading to learn* tests linguistically challenging, and at least a subset of the participants found the content engaging.

Table 20. Students Open-ended Feedback on Reading to Learn Tests

ID	Response	Passage
10	This isn't really anything to do with the activity in particular, but it's pretty hard to type in Japanese when you're used to English, so it really does take a long time.	overwork
11	It would be better if there are explanations of the concepts asked on the first page of the research questions.	overwork
15	In some of the quiz portion (testing vocabulary), it was hard to read some of the questions that were all in hiragana, though I'm sure that was part of the examination. Also I noticed some mistakes in the use of some kanji (same <i>yomikata</i> but wrong kanji). I'm sorry that I can't remember the mistake right now.	overwork
18	I did horribly. Please excuse the poor responses	overwork
18	I did horrible, すみません But, I think it would be good for on the multiple choice questions to have a 5th answer that says 'I don't know' or something like that so that your results are not misconstrued because of guessing. There were many problems that I would have just chosen that because I had no idea and I just hoped I did not guess correctly as to throw off my score.	global
21	I felt as though I didn't know how much work was still left to be done, so I didn't know how to appropriately budget my time. Perhaps including a menu on the bottom of the page, telling users how far along they are in the lesson, would be helpful.	overwork
22	I thought that the questions asked were very insightful and forced me to reflect on thoughts I previously were not aware of.	global

- 22 I thought the questions at the beginning were very interesting. I hope that my input will prove useful to this study. overwork
- 24 参考させていただいてありがとうございました！ [Thank you for letting me participate] overwork
- 26 it was an interesting activity but it was really hard in my opinion but that is probably because my Japanese level isn't that good or any good to be honest. global
- 27 この読みものやっぱり難しですね！ [In the end I guess this passage was difficult!] overwork
- 28 Good overwork
- 28 Good global
- 29 Compared to the last survey, this one had a different tone. I don't feel as bad about this one, because I tried my best in spite of my lack of interest in these topics. If my language skills were better, I could have gone more in-depth and probably give better answers than the ones I did give. As per usual, I hope my answers are somewhat easy to understand and helpful. If not, I am sorry. global
- 29 Some of these questions I don't believe I was qualified to answer. Mainly because I never really thought too much about it and could not offer any valuable insight into the study you are conducting. However, my view through and through is that overwork is a bad idea and it will always be a bad idea because people do not know how to regulate it. It is not something you regulate, and when people force other people to overwork, you get horrible results like death. That's what I think and what I'll more than likely think and not expand upon that any longer. overwork
- 30 It is an interesting study. overwork
- 30 Some questions are similar. global
- 34 There were some times where I understood the question but was unclear what direction in which I was being asked to think about. In these cases, the English translations were very helpful. global
- 35 I appreciate being allowed to participate in your study. The questions are hard but they are very important questions to be thinking about in this current age of globalization. It made me think about my own views on this matter for the first time. global

- 35 Thank you for letting me participate in your study. This test took me much longer to finish so for next time, I would increase the predicted time it would take people to complete the study so that they may plan accordingly. overwork
- 37 深い質問がたくさんあってちょっと難しかったです。とても考えなければならなかったのです。でも、これでいい情報が取れると思いますからいい事です。 [There were many deep questions so it was difficult. I had to think a lot. But I think I was able to obtain good information this way.] global
- 37 I think it was straightforward to complete and well put together. But I had some trouble telling which pages had new content on the left panel and for which ones it was just repeated. I am worried I skipped something since all the questions seemed to be about one article. overwork
- 39 The activity was certainly very challenging. I've only had to use my Japanese language skills to this extent on a very few number of occasions. I don't necessarily think I got every question completely right, but I think that at a basic level I was understand the basic meaning of both what I was reading and writing. This was a valuable way to evaluate how much I have already learned in regards to the Japanese language, as well as how much I still have to learn. Thank you. global
- 39 As was with the first article I had to read in my first session, I found a very high level of Japanese in this activity. I can honestly say that I didnt know most of the vocab, but I was still somewhat pleased with the level of comprehension that I think I came out with. All in all, I found it a good way to understand both my own skills, as well as learn a bit about an awful problem that is still being dealt with in Japan today. My hope is that I can actually apply this knowledge to my own work habits, now, and when looking for a full time, post graduate career. overwork
- 40 There seems to be a misconception that the participants in this study have any knowledge about how their culture as a whole feels about a particular topic, despite the obvious absurdities involved in such assumptions. Further, it assumes that we can get any appreciable knowledge of a foreign culture's views from a 2-paragraph excerpt. This presents a natural barrier to getting any useful information about foreign language ability since one cannot in general make intelligible comments on a topic in which he or she is not knowledgeable about in their native language let alone a foreign language. global
- 40 This was an interesting read and I thoroughly enjoyed it, but the last two questions really should have been saved for a later date in my opinion. Those kinds of things require time to ponder. overwork
- 42 All good overwork

- 44 I appreciate the ability to participate in this study. It was a fun experience and I have learned many things along the way, especially from this particular module today. どもありがとうございます！ global
- 46 長い [long] overwork
- 48 A little too hard for our level. Would be reasonable were the test shorter, but over time one's attention span would drain to the point that questions may not be answered adequately. If the test cannot be made easier, perhaps split this portion of the test into two parts, one containing the first two 15-minute sections, and the other containing the final 30-minute section. Additionally, it may be good to time participants and create an accurate average amount of time it takes to complete the test so that participants can come prepared. I look forward to the next session of this study. Keep up the good work! Thank you for your time. global
- 50 Very thought provoking and difficult. overwork
- 51 I'm glad reading that Japanese people are actually not happy about their working culture. What I always hear from them is 'shouganai' or it cannot be helped to work long hours. It is a problem that should be addressed more and hopefully companies will change their policies about that. overwork
- 53 日本語 4 0 1 を取っているけど、本文はちょっと難しいと思います。でも、中国人だから、まあ大丈夫です。 [I'm taking 4th year Japanese, but the passage was a bit difficult] global
- 53 I think the questions are somehow difficult to answer in Japanese. overwork
- 55 I am happy to say that I was extremely challenged, and you will probably see that within my own responses to your questions. Thank you for the resources that you have given us to complete this, I wouldn't have been able to do as much as I did without them. Again, I apologize for how awful my Japanese probably is. global
- 55 The content was easier to understand than the last round, however that may be because we have studied more Japanese since then. This exercise has shown me that there is a lot of Japanese that I still don't know. overwork
- 57 I thought that the format of the activity was good. I liked how the English translation would pop up when you clicked on certain kanji. global
- 57 Thank you! overwork
- 59 Typing in Japanese is monumentally more time consuming than just allowing participants to write on a piece of paper. overwork

64	I like that the whole activity focused on one passage, as opposed to having many. My main complaint is that the font was slightly difficult to read, both in English and in Japanese.	overwork
66	Nice activity	overwork
67	答えるのが少し難しいげと、いい質問でした。色々な考えができて、新しい知識を勉強しました。ありがとうございました。 [Answering was difficult, but there were good questions. I got to think about various things and gained new knowledge. Thank you.]	overwork
7	I think the last question was too repetitive and unnecessary. I would have just written the same thing I wrote in the other questions so I just skipped half of it.	global
71	問題が重ねるところがありますから、もっとクリエイティブで面白い問題が出ると思います。 [There were questions that overlapped, so I think it would be better to ask more creative interesting questions.]	overwork
72	The text font of the English translation of each question can be bigger.	overwork
72	It is nice and hopefully the passage can be more interesting in the future.	global
73	When asking to conduct my personal understanding to connect the animations to Japanese culture, it was a bit scary and frustration.	overwork

By coincidence, three of the four case learners in the qualitative analysis provided feedback. Interestingly, the participant from the lowest scoring cluster (P40) seemed to hold a different ideology towards ‘learning’ than the two participants from the high-scoring clusters (P67 and P57). P40 provided negative feedback in one of their responses, claiming that it is impossible to ‘learn’ very much from a short article, and that they did not have enough prior knowledge of the topic and their own culture to adequately answer the reflection questions. On the other hand, P57 and P67 provided positive feedback, finding the topics interesting and the activity engaging. Given these findings, it seems that learner disposition and attitude towards the *reading to learn* tasks is also important to consider in their performance.

In addition to the open-ended comments, the investigator was able to ask teachers from the intermediate classes (3rd year) in “target program” to send out the more detailed feedback survey to students in their classes. Seven of the twenty-six students responded, as summarized in Table 20. Since these students were enrolled in a Japanese program that emphasized integrated language and culture-learning skills in the course goals and activities, most were able to recognize alignment between the *reading to learn* tests and activities they performed within their class. However, it is also clear from their responses that intermediate Japanese learners felt the test was very challenging linguistically.

Table 21. Summary of Student Survey Feedback

Clarity	Number of Responses (Count)		
	<i>Very clear</i>	<i>Somewhat clear</i>	<i>Not very clear</i>
How clear were the learning objectives?	1	5	1
How clear were the instructions?	5	2	0

**What is your understanding of the purpose of the reading and culture-learning tests?
(please answer honestly)**

- 1 I understood that it was to assess our level of comprehension and cultural understanding.
- 2 I think reading and writing about these articles pushed me to compare Japanese and American culture and I think it was helpful because it introduced topics that were new but have similarities to phenomena I already know about.
- 3 to gauge reading comprehension and understanding of Japanese culture
- 5 To understand how our language courses fair in teaching students necessary skills and cultural aspects.
- 4 To test our ability to understand native Japanese articles related to topics we learn in class.
- 6 It seemed to be trying to teach us the nuances of Japanese culture in the native language, hoping to make that clearer by doing so

- 7 I see no purpose in these tests. They were long and tedious and in general discourages learning. Culture should be learned in more engaging and interactive ways, instead of via tests.

Usefulness	Number of Responses (Count)		
	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>
The technology-enhanced features of the test were useful. (e.g., hyperlink dictionary definitions, bilingual dictionary, feedback)	4	3	0
I found the topics in the reading passages interesting.	4	2	1

Difficulty	Number of Responses (Count)			
	<i>Easy</i>	<i>Somewhat easy</i>	<i>A little difficult</i>	<i>Very difficult</i>
How difficult were the reading passages?	0	0	6	1
How difficult was it to answer the comprehension questions?	0	0	7	0
How difficult was it to draw connections between the reading passage and your own cultural knowledge/experiences?	1	1	2	3

Classroom

Were the activities in reading and culture learning tasks similar to any of activities in your Japanese class? If so, which ones?

- 1 Similar to comprehension exercises we did.
- 2 The passage-reading and comprehension tasks were similar to activities for class, but the passages were much more specific and modern than those I have encountered in IJ-II. For example, while we might read about holidays in Japan for class, these readings are not as particular as the passage on the phenomenon of death by overwork.
- 3 thinking/answering questions about how the Japanese culture relates back to my culture.
- 4 Long essays completed in each unit.
- 5 Unit test

- 6 I've done readings about Japanese culture before in Introduction to Japanese Language and Culture, but this was different in the sense that I had to do it in Japanese and not my native language.
 - 7 Some questions asking for comparisons between my culture and Japanese culture appeared both in class and on this test.
-

What was the most challenging part of the reading and culture learning tests?

- 1 Both understanding and thinking of how to answer in Japanese.
 - 2 The most challenging part to me was trying to convey my thoughts in a way not exceeding my abilities in Japanese; I had to be sure to think in Japanese first so that I would not get frustrated by not being able to express myself using my limited knowledge of Japanese vocabulary and grammar.
 - 3 Understanding all the vocab/phrasing.
 - 4 There was some kanji that I was not that familiar with.
 - 5 Unknown phrases
 - 6 I had a hard time translating some of the sentences in the reading and when I did get the vocabulary, I wasn't sure if I got its use in context.
 - 7 Doing the comparisons in Japanese.
-

Overall, feedback on the *reading to learn* tests indicate that many students felt linguistically challenged and a subset of participants felt the task was very thought-provoking and interesting, it appears that many learners were more concerned about expressing their language skills and reading proficiency than expressing their knowledge refinement about the societal issues within the text. Interestingly, participants' comments about the linguistic challenge do not match their performance, since the majority of students gained adequate comprehension of the text and wrote coherent responses in their reflections. However, it was probably very cognitively taxing and required a fair amount of time for them to feel satisfied with their comprehension of the passages and answers to the reflection responses.

Summary

Prior Knowledge Scaffolding

This study did not show a large difference between prior knowledge scaffolding and non-scaffolding conditions on students' knowledge refinement. There are several possible explanations for this result. As shown in the results section (Figure 3), many students chose not to complete the entire scaffolding section because half of it was optional. Similar to Harrell's (2008) study, it is possible that only students who made full use of the scaffolding were able to fully benefit from the scaffolding condition. Another possibility is that students did not want to repeat what they wrote about during the scaffolding section in their reflection responses. Finally, it is also possible that prior knowledge scaffolding does not work when it is not implemented within a pedagogical context where students recognize the purpose of the scaffolding task. Refinements to the test instructions and the design of the scaffolding section may help us improve our understanding of prior knowledge integration and knowledge refinement in future studies.

It was also notable that learners demonstrated a wide distribution of prior knowledge activation in both the scaffolding and non-scaffolding condition. This seems to indicate that many students are already capable of activating prior knowledge, even without prior knowledge scaffolding. Among learners who did not activate prior knowledge, it would be helpful to know if they recognized the purpose of the task, if they used strategies or not, and if the linguistic and cognitive demands of the task simply made it hard for them to focus on anything beyond text-based comprehension. Interestingly, however, linguistic demands did not appear to hinder learners' prior knowledge activation.

Language Proficiency

Language Proficiency did not affect learners' ability to activate prior knowledge, as there was no relationship between JLPT scores and prior knowledge references ($r(132) = 0.34$, $p < 0.001$). Since responses averaged 95.8% on the comprehensibility of their responses, learners' productive writing skills were more than adequate at conveying prior knowledge. These results support the notion that adult foreign language learners can integrate prior knowledge with concepts from the text on specialized topics regardless of their proficiency level (Hulstijn, 2011). However, it would also be helpful to know if participants already developed higher-order reading skills and have practiced integrating their prior knowledge with texts in their first language.

While language proficiency did not affect learners' activation of prior knowledge, it did influence their reflection scores. Together, response length and JLPT scores predicted 68.9% of the variance in students' scores. Response length appears to be a partial indicator of learners' language proficiency, because students who were more fluent in reading and writing could write longer reflections. The qualitative examination of learner responses helped explain why response length was the strongest predictor of their scores.

Response length was probably influenced by numerous factors, including language proficiency, higher-order thinking skills, and orientation to the task. While there was a correlation between response length and language proficiency ($r(132) = 0.37$, $p < 0.001$), students' productive writing skills were more than adequate for the task, evidenced by their close to perfect scores on language comprehensibility (92% of answers received full marks). Students' feedback suggests that some felt the test was challenging and long, which may be related to their reading and writing fluency. Less fluent students took about 2 hours, whereas students who were more fluent at reading and writing were able to finish the assessment within an hour. On average, the majority of students took approximately 1.5 hours to complete. It is notable that

several students mentioned that they wanted more time to think about the issues before writing their reflections (Table 20).

Based on the quantitative and qualitative analyses, language proficiency may have influenced students' reflection scores if students were unable to communicate clear connections between their main points and supporting information using cause-effect transition phrases. In many responses, students stated information without relating it previously mentioned ideas. This was exemplified in P67's response to Reflection Question 3, where they made a text reference in their last sentence without using any explanatory clauses or transition phrases to explain how this information related to other ideas. Students often stated information without relating it to previously mentioned ideas, or lacked explanatory clauses all together. Other times, students were not able to differentiate between fact and opinion, particularly when stating notions about Japanese culture or their own culture. This was particularly prevalent when students failed to state where they obtained certain notions about each culture, whether it be a friend or personal experience. Without doing so, it is impossible for us to know the extent of their cultural awareness on a metacognitive level. Since learners are in their third and fourth years of Japanese language study, it is likely that they have studied the language structures needed to form explanatory clauses and connective phrases; however, it is also possible that students did not have much practice or fluency with using them to express culture-learning skills beyond *Communication*, which is what is currently most emphasized in U.S. foreign language classrooms (Cox, Malone, Winke, 2018; Sercu, 2006).

Participants' feedback indicated that many learners felt the *reading to learn* task was linguistically challenging, but at the same time felt the content and activities were thought-

provoking. This feedback is encouraging, since it suggests that learners generally have positive attitudes towards *reading to learn* tasks as long as the linguistic level is appropriate.

In summary, the findings of this study indicate that students can activate prior knowledge regardless of proficiency level. However, students may need a certain amount of reading and writing fluency to engage in higher order thinking tasks within a short amount of time. In addition, some students may benefit from instruction on how to distinguish fact from personal opinion, or from instruction on how to explicitly explain where their prior knowledge and beliefs come from in writing. These skills require both L2 proficiency and higher-order thinking skills, which must be taught together if we want to improve students reading skills for the purposes of learning in the L2 classroom.

CHAPTER 5

Conclusions & Implications

Summary of Findings

This study revealed several important findings about the role of prior knowledge in supporting learners' L2 higher order thinking skills. While prior knowledge scaffolding slightly enhanced learner's activation of prior knowledge, the difference was small. Among both the scaffolding and nonscaffolding conditions, students who expressed more prior knowledge activation within their reflection questions also achieved higher scores, but the influence of prior knowledge was small in comparison to the contribution of response length. Language proficiency did not influence students' ability to activate prior knowledge or the coherence-level of their reflection responses. However, a qualitative analysis of learners' responses suggests that students who demonstrated higher levels of knowledge refinement were better at elaborating on their conclusions about Japanese culture and their own culture. Survey results also indicated that many students were more concerned about vocabulary, text-based reading comprehension, and other language-based challenges of the task more so than conceptual engagement within the cultural comparison and reflection tasks. It appears that a students' reading and writing fluency, along with their orientation to the task made the strongest impact on their expression of knowledge refinement in the reflection section.

Limitations

This study was not able to examine learners' activation of prior knowledge beyond what they expressed in their responses. In addition, this study did not look at how specific instances of prior knowledge activation influenced learners' evaluations, opinions, and conclusions about

the passage topics. While the number of prior knowledge references for each learner was coded and tallied, it was not possible to categorize the statements into “stronger” or “weaker” types of prior knowledge. Doing so would have been difficult, since as noted, learners were not always clear, explicit, or even aware of how prior knowledge and experiences influenced their conclusions.

This study also did not examine how learners’ text meaning construction contributed to their knowledge refinement. In other words, the study did not investigate how learners used their interpretations of the text to inform their reflections. This limitation is largely due to time restrictions. Future studies could investigate how students balanced text references and their prior knowledge to inform their reflections and refine their understanding of the topics presented in the texts. For example, students in clusters 3 and 4 both scored well on the reflection responses, but cluster 4 made less prior knowledge references. It is possible that learners in cluster 3 simply used more text references to support their conclusions.

By coding students’ use of text references, it would also help us determine how students balanced the use of text references and prior knowledge references to justify their refined understandings of Japan and their own culture. While coding data for prior knowledge references, it was observed that students integrated the most prior knowledge when asked to reflect on their own culture, in the third and fourth reflection questions. Did students who integrated less prior knowledge in their responses to these orient to the task differently? Based on student responses and feedback, the author suspects that students were less socialized into the practice of integrating prior knowledge during language learning tasks, and were more inclined to summarize the text, particularly for Reflection Question 1, where they were asked to describe what they learned about Japanese culture.

Improving Test Design & Procedures

There were clear limits involved with the design of the *reading to learn* assessment. Most obvious is the design of the prior knowledge scaffolding section, as it had a significant but small effect on learners' activation of prior knowledge. It is possible the prior knowledge scaffolding would have had a stronger effect 1) if all sections had been required, 2) if students had more time to complete the test, or 3) if students had been more explicitly encouraged to use their answers in the scaffolding section within their reflection responses. The first two limitations are difficult to resolve without increasing learners' test fatigue, but future implementations might consider administering the assessment in 2-3 installments. The third limitation can be resolved simply by adjusting the technological platform to display students' answers to the scaffolding section alongside the reflection questions, or by allowing students to switch easily between different parts of the test. We can also provide more explicit instructions, encouraging students to reuse concepts they activated in the scaffolding section within the reflection responses.

Another limitation of this study was the unclear role of response length on students' reflection scores. Response length appears to be a partial result of reading and writing fluency. However, since the test was not timed, it may also be a result of learners' motivation to elaborate on their conclusions. Besides administering the test in multiple installments, future implementations could consider setting a maximum word count on how much students write.

It is also possible to break reflection questions up into a series of shorter questions; for example, by asking students to present a conclusion in the first question, followed by questions that prompt students to reflect on what information from the text or their personal experiences

influenced their beliefs about the issue. However, we would have to consider if breaking down reflection questions this way would simply be another form of scaffolding.

Future Directions

Technology-Enhanced Learning

The technology-enhanced features of the *reading to learn* assessment were vital for creating a student-centered test. By allowing students to write short-answer responses, students could engage in personal-meaning construction during all sections of the test. Many reading and assessment scholars have noted the importance of open-ended questions in assessing students' personal-meaning construction during the reading process (Kintsch, 1988; 1998), because multiple-choice questions force readers to select one interpretation of the text predetermined by the test developers. In doing so, students are denied the chance for personal-meaning construction and building a situation model (McNamara et al., 1996). If students are constantly told how to think about a text, then we deny them the chance to develop their own agency, voice, and critical thinking skills for interpreting the text information and understanding the topic through their knowledge of the world. While the technology-enhanced features of the assessment were designed to promote these skills, future studies could address how effective these features were, and if other features could do more to promote these skills.

To promote students' personal-meaning construction, the technology in this study afforded a number of advantages over a paper-based test. During the comprehension section, hyperlink glosses allowed students to extract meanings from the text, while the bilingual dictionary also allowed students to communicate their personalized meaning construction. While most students were able to gain adequate comprehension of the text, it is possible that other

technological features could have provided more support in this area, as some students took much longer to finish the comprehension section of the test. For example, many computer-mediated tests are able to provide automatic feedback (e.g., Graesser & McNamara, 2012, Leacock & Chodorow, 2003) for short answer responses. While we do not want to tell students how to interpret the text, automatic feedback could inform students if they are missing key words or ideas important for answering a given comprehension question.

To aid the scoring process, technology in this study also provided several advantages. Students' responses could be fed into a program that highlighted rhetorical patterns in students' writing, where they engaged in comparisons, contrasts, transitions, references to text information, references to prior knowledge, and other rhetorical moves. In doing so, the program assisted teachers and researchers in scoring student responses, while also providing a way to compare scores, and discuss their approaches to scoring after several training sessions. However, even with assistance from technology, the scoring process still required time and careful consideration of each student response. Future studies could investigate teacher experiences with using technology-enhanced scoring, and how the process could help train scorers, aid scoring efficiency, and improve inter-rater reliability.

Integrated Intercultural Competence and Literacy Skills

The research questions in this study focused on higher-order thinking skills, but in the context of FL education, where intercultural competence is one of the primary desired outcomes. Intercultural competence has been defined by many scholars, but in her synthesis of studies and survey of experts, Deardorff (2006) created a pyramid model of intercultural competence to describe its different facets. In this model, higher-order thinking skills were considered part of

the “Knowledge & Comprehension” facet of intercultural competence, specifically referred to as skills “To listen, observe, evaluate, analyze, interpret, and relate” (p. 256). This study focused on students’ ability to observe, interpret, analyze, relate, and evaluate as they engaged in personal-meaning construction, integrated prior knowledge with the text, relate cultural values and practices, and use these skills to inform their evaluations about the issues presented in the passages. However, future studies can also explore the “Attitudes” facet of intercultural competence described in Deardorff’s model and other descriptions of intercultural competence (e.g., Byram, 1997). In particular, this type of research provides opportunities to explore students’ openness (willingness to suspend judgement), respect (valuing of other cultures), and empathy (ability to view issues through the lens of the target culture). However, the study did not examine students’ disposition, or how it did or did not change depending on the condition or time of administration (first or second). Future studies could investigate whether promoting students’ higher-order thinking skills during the *reading to learn* process can develop more empathy and open-mindedness towards the target culture.

In addition to students’ disposition and openness to the target culture, future studies could also consider ways to raise students’ cultural awareness. In this study, the researcher and second rater observed that students were generally skilled at talking about themselves and their personal interests, but markedly less skilled at making cultural comparisons, recognizing diversity within their own culture, or expressing awareness of their own culture and its influences on their personal experiences and perspectives. In other words, many students did not express awareness of themselves “as cultural beings” or show the awareness of the ways their own culture has influenced their perspectives (Byram, 2000). This may be partially due to limitations in the test design, as a section on the reflection rubric asked students to reflect on how their *personal* views

changed, rather than asking them to reflect on how their understanding of their own culture changed. Future assessments may benefit from prompting students to reflect on the influence of culture on their own values; for example, by considering ways that mass media, historical events, and educational practices in their culture has influenced their current perspectives. These areas deserve future research if we want to continue exploring ways to support and assess students' intercultural competence.

Pedagogical Implications

Promoting Students' Use of Prior Knowledge

This study found that students are able to activate their prior knowledge at large range of L2 proficiency levels. However, some students were less willing to activate prior knowledge than others, which has several implications for teaching *reading to learn* skills in the foreign language classroom. When promoting students' *reading to learn* skills, foreign language learners can be encouraged to talk about their prior knowledge and experiences when they engage in L2 comprehension tasks.

For beginning level language courses, it would be important to design that tasks with ample linguistic scaffolding or minimize the amount of complex language needed for the tasks. For example, teachers could use information gap activities, graphic organizers, and supplemental vocabulary lists to help students personalize meanings and communicate them to others. As students gain more language proficiency, they can engage in comparison activities that allow them to integrate prior knowledge of their own language and culture. For example, students often compare foreign languages to their native language during the learning process. Teachers may be able to use this as an opportunity to have students reflect on the relationship between

culture and language. What Japanese cultural values and history may have influenced the way the language contains so many honorific forms, with countless ways of expressing one's apology, gratitude, or respect to interlocutors? In contrast, what American values and history might account for the lack of such structures? Students can be encouraged to use their prior knowledge and experiences to reflect on culture in highly intellectual discussions.

Unfortunately, the most popular Japanese textbooks currently available tend to treat culture as a supplementary topic, often through a "culture notes" section. This is common among many popular Japanese foreign language textbooks, such as *Genki* (Banno, Ikeda, Ohno, Shinagawa, & Tokashiki, 2011), *Situational Functional Japanese* (Hatasa, 2014), and *Nakama* (Otsubo & Tsukuba-Rangejigurupu, 1997). By treating culture as "supplemental," we miss opportunities for engaging students in meaningful reflection and discussion of their own culture and experiences. Teachers can encourage adult foreign language learners to make use of their cognitive maturity to critically reflect on how their home cultures' values influence language use and communication practices.

Supporting Integrated Language and Literacy Skills

The results of this study indicated that many students either lacked language skills to distinguish personal opinions from prior cultural knowledge, or lacked the cultural awareness and literacy skills to explain how their own culture's values and practices influenced their conclusions. Most participants in this study were in their third and fourth years of language study and have already gained the linguistic structures needed to indicate hearsay, cite references, denote past experiences, and explain their analyses and evaluations. However, most

learners had little practice applying this linguistic knowledge to communicate abstract, intellectual ideas and reflections.

Based on the findings of this study, it appears that students may benefit from increased awareness of language devices used to differentiate between their experiences, prior knowledge, and opinions. For example, teachers might ask students to clarify what information in their writing is "fact" versus "opinion" in the reading passage, and what phrases within their own writing can be used to indicate one or the other. In addition, it appears that some students may need extra prompting to ensure that they explain or elaborate on their points. Some students may simply need more time to think about and write explanations, but other students may not recognize the need to reflect on the circumstances that influenced their perceptions and to explain this to an audience. To facilitate this, it is important for teachers to support grammar and vocabulary based on the communicative needs and context of a content learning task.

Developing a Pedagogical Ecosystem

Foreign language programs that are committed to promoting students' intercultural competence need to develop a system of materials, curriculums, classroom activities, and assessments that socialize students into the importance of integrated language and culture-learning skills. The study originally intended to focus on Japanese learners within a program with an established ecosystem of support for these skills; however, due to the small number of participants in this program, the study was expanded to include learners from several university programs. Although this study did not investigate the program-level objectives of these programs, a student from one of the larger programs noted how the assessment was "different from anything we've ever done in class" (Participant 34, Personal Communication). Student

responses on the assessment also suggested that many were not used to the practice of integrating prior knowledge with text ideas for the purpose of knowledge expansion and or refined cultural understanding, as many students treated every question as a summarization task. These observations align with surveys of current FL practices, where FL programs and teachers were found to embrace positive attitudes towards ACTFL's standards and promotion of the 5 C's, but in practice tend to focus primarily on communication (Cox, Malone, Winke, 2018; Sercu, 2006).

Even within a program that has a well-established system for supporting integrated language and culture-learning skills, program coordinators and teachers are still developing awareness and understanding on how to best support these skills. The author realized this during the process of developing the integrated reading and culture-learning assessment with other Japanese teachers in the program. Test development required extensive involvement from three other Japanese instructors, as they aided in adjusting language in the passages and provided input in developing the questions and assessment scoring rubrics. In addition, the instructors and author worked together over many sessions to discuss appropriate scoring procedures for students' open-ended responses. During this process, we repeatedly discussed what parts of students' responses expressed their higher-order thinking and *reading to learn* skills. In doing so, our own understanding of how to assess and support *reading to learn* skills became clearer. As our understanding of how to assess the construct became clearer, one of the teachers suggested that he should assign a similar reflection task in his course so that students could become more familiar with the practice. While anecdotal, it appears that foreign language programs that wish to support integrated language and culture skills can benefit from teacher involvement and collaboration, along with assessments that promote positive washback on teaching practices.

This dissertation investigated the complex relationships between L2 proficiency, reading comprehension, and L2 higher-order thinking skills. Findings revealed strong relationships between these skills, but also raised the question of students' orientations towards *reading to learn* practices, due to the strong variation in the length and content of students' responses. Some students may not have recognized L2 knowledge refinement as a desirable learning outcome if they did not receive L2 *reading to learn* instruction or practice within the FL classroom. It appears that the field of FL research and teaching must continue working together to communicate its importance and support these skills among L2 learners.

REFERENCES

- Adams, M. J. (1994). *Beginning to Read: Thinking and Learning about Print* (Reprint edition). Cambridge, Mass.: A Bradford Book.
- American Council on the Teaching of Foreign Languages (ACTFL). (2012). ACTFL Proficiency Guidelines. Retrieved from <http://www.actfl.org/publications/guidelines-and-manuals/actfl-proficiency-guidelines-2012>
- Anderson, L. W., Krathwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., ... Wittrock, M. C. (2000). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Blooms' Taxonomy of Educational Objectives, Abridged Edition* (1 edition). New York: Pearson.
- Banchi, H., & Bell, R. (2008). The many levels of inquiry. *Science and Children*, 46(2), 26.
- Banno, E., Ikeda, Y., Ohno, Y., Shinagawa, C., & Tokashiki, K. (2011). *An integrated course in elementary Japanese. 1: ...* (Second edition). Tōkyō: The Japan Times.
- Barry, S., & Lazarte, A. A. (1998). Evidence for Mental Models: How Do Prior Knowledge, Syntactic Complexity, and Reading Topic Affect Inference Generation in a Recall Task for Nonnative Readers of Spanish? *The Modern Language Journal*, 82(2), 176.
<https://doi.org/10.2307/329207>
- Beck, I. L., McKeown, M. G., Sinatra, G. M., & Loxterman, J. A. (1991). Revising social studies text from a text-processing perspective: Evidence of improved comprehensibility. *Reading Research Quarterly*, 251–276.
- Bernhardt, E. (2005). Progress and procrastination in second language reading. *Annual Review of Applied Linguistics*, 25, 133–150.
- Blooms, B. S. (1956). Taxonomy of educational objectives. *David McKay*, New York.

- Brantmeier, C. (2005). Effects of reader's knowledge, text type, and test type on L1 and L2 reading comprehension in Spanish. *The Modern Language Journal*, 89(1), 37–53.
- Britton, B. K., & Gülgöz, S. (1991). Using Kintsch's computational model to improve instructional text: Effects of repairing inference calls on recall and cognitive structures. *Journal of Educational Psychology*, 83(3), 329–345.
- Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Multilingual Matters.
- Byram, M. (2000). *Assessing intercultural competence in language teaching*. Sprogforum.
- Carrell, P. L. (1983). Some issues in studying the role of schemata, or background knowledge, in second language comprehension. *Reading in a Foreign Language*, 1(2), 81–92.
- Carrell, P. L. (1989). Metacognitive Awareness and Second Language Reading. *The Modern Language Journal*, 73(2), 121–134. <https://doi.org/10.2307/326568>
- Chall, J. (1983). *Stages of Reading Development*. Harcourt Brace College Publishers.
- Chularut, P., & DeBacker, T. K. (2004). The influence of concept mapping on achievement, self-regulation, and self-efficacy in students of English as a second language. *Contemporary Educational Psychology*, 29(3), 248-263.
- Common Core State Standards, & others. (2010). *Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects*. Retrieved from <http://www.corestandards.org/ELA-Literacy/>
- Council of Europe. (2001). *Common European Framework of Reference for Languages: Learning, Teaching, Assessment*. Cambridge etc.: Cambridge University Press.
- Cox, T. L., Malone, M. E., & Winke, P. (2018). Future directions in assessment: Influences of standards and implications for language learning. *Foreign Language Annals*.

- Cummins, J. (1979). Linguistic Interdependence and the Educational Development of Bilingual Children. *Review of Educational Research*, 49(2), 222–251.
- Cummins, J. (1980). Psychological assessment of immigrant children: Logic or intuition? *Journal of Multilingual and Multicultural Development*, 1(2), 97–111.
- Deardorff, D. K. (2006). Identification and assessment of intercultural competence as a student outcome of internationalization. *Journal of Studies in International Education*, 10(3), 241–266.
- Droop, M., & Verhoeven, L. (1998). Background knowledge, linguistic complexity, and second-language reading comprehension. *Journal of Literacy Research*, 30(2), 253–271.
- Droop, M., & Verhoeven, L. (2003). Language proficiency and reading ability in first-and second-language learners. *Reading Research Quarterly*, 38(1), 78–103.
- Eftekhari, M., Sotoudehnama, E., & Marandi, S. S. (2016). Computer-aided argument mapping in an EFL setting: does technology precede traditional paper and pencil approach in developing critical thinking? *Educational Technology Research and Development*, 64(2), 339–357. <https://doi.org/10.1007/s11423-016-9431-z>
- Enright, M., Grabe, W., Koda, K., Mosenthal, P., Mulcahy-Ernt, P., & Schedl, M. (2000). *TOEFL 2000 reading framework*. Educational Testing Service Princeton, NJ. Retrieved from <http://www.ets.org/Media/Research/pdf/RM-00-04-Enright.pdf>
- Europe, C. of. (2001). *Common European Framework of Reference for Languages: Learning, Teaching, Assessment*. Cambridge etc.: Cambridge University Press.
- Foltz, P. W., Streeter, L. A., Lochbaum, K. E., & Landauer, T. K. (2013). Implementation and applications of the intelligent essay assessor. *Handbook of Automated Essay Evaluation*, 68–88.

- Gómez, R., (2012). Fostering intercultural communicative competence through reading authentic literary texts in an advanced Colombian EFL classroom: A constructivist perspective. *Profile Issues in Teachers Professional Development*, 14(1), 49–66.
- Grabe, W., & Jiang, X. (2013). Assessing Reading. In *The Companion to Language Assessment*. John Wiley & Sons, Inc.
- Graesser, A. C., & McNamara, D. S. (2012). Automated analysis of essays and open-ended verbal responses. *APA Handbook of Research Methods in Psychology*, 1, 307–325.
- Hammadou, J. (2000). The impact of analogy and content knowledge on reading comprehension: What helps, what hurts. *The Modern Language Journal*, 84(1), 38–50.
- Harrell, M. (2008). No computer program required: Even pencil-and-paper argument mapping improves critical-thinking skills. *Teaching Philosophy*, 31(4), 351–374.
- Hartigan, J. A. and Wong, M. A. (1979). A K-means clustering algorithm. *Applied Statistics* 28, 100–108.
- Hatasa, Y. A. (2014). *Nakama 1: introductory Japanese: communication, culture, context* (3rd Ed). Stamford, CT: Cengage Learning.
- Horiba, Y., & Fukaya, K. (2015). Reading and learning from L2 text: Effects of reading goal, topic familiarity, and language proficiency. *Reading in a Foreign Language*, 27(1), 22.
- Hulstijn, J. H. (2011). Language Proficiency in Native and Nonnative Speakers: An Agenda for Research and Suggestions for Second-Language Assessment. *Language Assessment Quarterly*, 8(3), 229–249.
- Japan Foundation, & Japan Educational Services and Exchanges. (2012). Japanese-Language Proficiency Test. Retrieved December 14, 2015, from <http://www.jlpt.jp/e/>

- Jiang, X., & Grabe, W. (2007). Graphic organizers in reading instruction: Research findings and issues. *Reading in a Foreign Language*, 19(1), 34.
- Joh, J. (2004). Which prior knowledge? Relative contribution of prior knowledge components to EFL reading comprehension. *Language Research*, 40(4), 1035–1057.
- Katkin, W. (2003). The Boyer Commission Report and its Impact on Undergraduate Research. *New Directions for Teaching and Learning*, 2003(93), 19–38.
- Kendeou, P., & van den Broek, P. (2007). The effects of prior knowledge and text structure on comprehension processes during reading of scientific texts. *Memory & Cognition*, 35(7), 1567–1577.
- Kintsch, W. (1988). The role of knowledge in discourse comprehension: a construction-integration model. *Psychological Review*, 95(2), 163.
- Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge university press.
- Kintsch, W. (2013). Revisiting the construction–integration model of text comprehension and its implications for instruction. In D. Alvermann, N. Unrau, & R. Ruddell (Eds.), *Theoretical models and Processes of Reading* (6th ed., pp. 807–839). International Reading Association.
- Koda, K. (2010). The role of reading in fostering transcultural competence. *Reading in a Foreign Language*, 22, 5.
- Koda, K. & Yamashita, J. (2018). An Integrated Approach to FL Interaction and Assessment. Georgetown University Round B Proceedings.
- Leacock, C., & Chodorow, M. (2003). C-rater: Automated scoring of short-answer questions. *Computers and the Humanities*, 37(4), 389–405.

- Lee, J. H., & Hasebe, Y. (2016). Readability measurement for Japanese text based on leveled corpora. *Papers on Japanese Language from an Empirical Perspective, Ljubljana: Academic Publishing Division of the Faculty of Arts, Univ. of Ljubljana*.
- MacSwan, J., & Rolstad, K. (2005). Modularity and the facilitation effect: Psychological mechanisms of transfer in bilingual students. *Hispanic Journal of Behavioral Sciences*, 27(2), 224–243.
- McNamara, D. S., Kintsch, E., Songer, N. B., & Kintsch, W. (1996). Are good texts always better? Interactions of text coherence, background knowledge, and levels of understanding in learning from text. *Cognition and Instruction*, 14(1), 1–43.
- MLA Ad Hoc Committee on Foreign Languages. (2007). Foreign Languages and Higher Education: New Structures for a Changed World: MLA Ad Hoc Committee on Foreign Languages. *Profession*, 234–245.
- O'Reilly, T., & McNamara, D. S. (2007). Reversing the reverse cohesion effect: Good texts can be better for strategic, high-knowledge readers. *Discourse Processes*, 43(2), 121–152.
- Otsubo, K., & Tsukuba-Rangējigurūpu (Eds.). (1997). *Situational functional Japanese: Notes* (2. ed., [3. Dr.]). Tokyo: Bonjinsha.
- Pretorius, E. J. (2005). English as a second language learner differences in anaphoric resolution: *Reading to learn* in the academic context. *Applied Psycholinguistics*, 26(4), 521–539.
- Reynolds, R. E., Taylor, M. A., Steffensen, M. S., Shirey, L. L., & Anderson, R. C. (1982). Cultural Schemata and Reading Comprehension. *Reading Research Quarterly*, 17(3), 353–366.
- Sercu, L. (2006). The foreign language and intercultural competence teacher: The acquisition of a new professional identity. *Intercultural Education*, 17(1), 55–72.

- Shanahan, C., Shanahan, T., & Cartright, K. B. (2008). Content-area reading/learning. *Literacy Processes: Cognitive Flexibility in Learning and Teaching*, 208–233.
- Steffensen, M. S., Joag-Dev, C., & Anderson, R. C. (1979). A Cross-Cultural Perspective on Reading Comprehension. *Reading Research Quarterly*, 15(1), 10–29.
- Sternberg, R. J. (1999). Intelligence as developing expertise. *Contemporary Educational Psychology*, 24(4), 359–375.
- The National Standards Collaborative Board. (2015). *World-readiness standards for learning languages* (4th ed.). Alexandria, VA: Author.
- Trites, L., & McGroarty, M. (2005). Reading to learn and reading to integrate: new tasks for reading comprehension tests? *Language Testing*, 22(2), 174–210.
- Uso-Juan, E. (2006). The Compensatory Nature of Discipline-Related Knowledge and English-Language Proficiency in Reading English for Academic Purposes. *The Modern Language Journal*, 90(2), 210–227.
- Zwaan, R. A., & Radvansky, G. A. (1998). Situation models in language comprehension and memory. *Psychological Bulletin*, 123(2), 162.

APPENDIX A

Alignment between Reading-to-Learn Assessment, ACTFL, and Blooms' Taxonomy

ACTFL Standards (5 Cs)		Blooms' Taxonomy	<i>Reading to learn Rubric</i>
Communication	<p>Standard 1.2: Students understand and interpret written and spoken language on a variety of topics.</p> <p>Standard 1.3: Students present information, concepts, and ideas to an audience of listeners or readers on a variety of topics.</p>	<p>Understand (Q1,2)</p> <p>Evaluate (Q3,4)</p> <p>Apply (Q3,4)</p> <p>Create</p>	<p>Comprehension</p> <p>Reflection: Prior Knowledge, Learn</p>
Cultures	<p>Standard 2.1: Students demonstrate an understanding of the relationship between the practices and perspectives of the culture studied.</p>	<p>Analyze</p> <p>Apply</p>	<p>Reflection: Relationships</p>
Connections	<p>Standard 3.1: Students reinforce and further their knowledge of other disciplines through the foreign language.</p> <p>Standard 3.2: Students acquire information and recognize the distinctive viewpoints that are only available through the foreign language and its cultures.</p>	<p>Analyze</p> <p>Evaluate</p>	<p>Reflection: Learn, Diversity</p>
Comparisons	<p>Standard 4.2: Students demonstrate understanding of the concept of culture through comparisons of the cultures studied and their own.</p>	<p>Analyze</p> <p>Apply</p>	<p>Reflection: Compare</p>
Communities	<p>Standard 5.1: Students use the language both within and beyond the school setting.</p> <p>Standard 5.2: Students show evidence of becoming life-long learners by using the language for personal enjoyment and enrichment.</p>	N/A	N/A

Summary of Cognitive Processes in Blooms' Taxonomy

Category	Cognitive Process
Remember	Retrieve relevant knowledge from long-term memory RECOGNIZING (identifying) RECALLING (retrieving)
Understand	Construct meaning from instructional messages, including oral, written, and graphic communication INTERPRETING (clarifying, paraphrasing, representing, translating) EXEMPLIFYING (illustrating, instantiating) CLASSIFYING (categorizing, subsuming) SUMMARIZING (abstracting, generalizing) INFERRING (concluding, extrapolating, interpolating, predicting) COMPARING (contrasting, mapping, matching) EXPLAINING (constructing models)
Apply	Carry out or use a procedure in a given situation EXECUTING (carrying out) IMPLEMENTING (using)
Analyze	Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose DIFFERENTIATING (discriminating, distinguishing, focusing, selecting) ORGANIZING (finding coherence, integrating, outlining, parsing, structuring) ATTRIBUTING (deconstructing)
Evaluate	Make judgments based on criteria and standards CHECKING (coordinating, detecting, monitoring, testing) CRITIQUING (judging)
Create	Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure GENERATING (hypothesizing) PLANNING (designing) PRODUCING (constructing)

Chart adapted from Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001). *A taxonomy for Learning, teaching, and assessing: A revision of Blooms' taxonomy of educational objectives*. New York: Addison Wesley Longman.

APPENDIX A

Background Language Experience Questions

1. Your Age:
2. Gender: Male/Female/Nonbinary
3. What is your native language?
4. What is your strongest language? (may be the same as question 1)
5. Please list all the other languages you speak from most fluent to least fluent:

1	2	3	4
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6. What language(s) do your parents speak?
7. Please select your highest education level.
 - ☐ Less than High School
 - ☐ High School
 - ☐ Professional Training
 - ☐ Some College
 - ☐ College
 - ☐ Masters
 - ☐ Ph.D./M.D./J.D.
 - ☐ Other:
8. In what country(s) did you receive this education?
9. How many years have you been attending an English-medium school?
10. At what age did you start learning (or using) Japanese?
11. How long have you studied Japanese?
 Years: _____ Months: _____
12. How many semesters of Japanese have you taken in college?
13. How many semesters of Japanese have you taken in high school?
14. Are you currently taking Japanese at university?
 Yes No
15. Have you ever visited a Japanese speaking country?
 Yes No
16. If so, how long were you there? Years: _____ Months: _____
17. If you have spent time in Japan, how often did you use Japanese and for what purposes?
18. On average, how many hours a day do you currently study or use Japanese?
 Hours a day: _____
19. What percentage of this time do you spend reading, writing, listening, and speaking Japanese? (the numbers should add up to 100)

reading	writing	speaking	listening

20. What types of materials do you read in **English**? Check all that apply.

- ☐ magazines
- ☐ newspaper articles (including online)
- ☐ novels textbooks
- ☐ research papers
- ☐ poems
- ☐ essays
- ☐ short stories
- ☐ Twitter
- ☐ Facebook
- ☐ other:

12. What types of materials do you read in **Japanese**? Check all that apply.

- ☐ magazines
- ☐ newspaper articles (including online)
- ☐ novels textbooks
- ☐ research papers
- ☐ poems
- ☐ essays
- ☐ short stories
- ☐ Twitter
- ☐ Facebook
- ☐ other:

APPENDIX B

Japanese Language Proficiency Test (JLPT)

Example Questions (- Scaffolding Condition)

1. Vocabulary Fill-in-the-blank

次の文の____に入る最もよいものを、1・2・3・4から一つ選びなさい。

[‘Instructions: Select the most appropriate item, 1 2 3 or 4 to fill in the ____.’]

1. この携帯（けいたい）電話はボタンが押（お）しにくいという（ ）を持つ利用者もいる。

[There are users who have the () that the button on this cell phone is hard to press.]

- a. 不満 [dissatisfaction]
- b. 関心 [interest]
- c. 目標 [goal]
- d. 我慢 [patience]

2. 街を（ ）していたら、山本さんに会った。

[After () the town, we met Mr. Yamamoto.]

- a. ぶらぶら [wandering]
- b. ぐらぐら [trembling]
- c. がらがら [rattling]
- d. ばらばら [separating]

2. Select Vocabulary Definitions

____の言葉に意味が最も近いものを、1・2・3・4から一つを選びなさい。

Instructions: Select the answer a, b, c, or d that most closely matches the meaning of the underlined phrase.

1. 私は妻と一緒に通勤しています。

[My wife and I commute to work together.]

- a. 仕事に行って [go to work]
- b. 勉強に行って [go to study]
- c. 買い物に行って [go to shop]
- d. 散歩（さんぽ）に行って [to on a walk]

2. とてもおそろしい経験をした。

[I had a very terrifying experience.]

- a. こわい [scary]
- b. たのしい [fun]
- c. うれしい [happy]

d. はずかしい [embarrassing]

3. Vocabulary Depth (Contextual Usage)

次の言葉の使い方として最もよいものを 1・2・3・4 から一つ選びなさい。

Instructions: Please select the sentence a, b, c, or d that is most appropriate for each word.

1. ころぶ

[to fall]

- a. 階段（かいだん）でころんでけがをした。
[I fell down the stairs and injured myself.]
- b. 今日は疲（つか）れたので、早めにベッドにころんだ。
[Today he was tired, so he fell into bed early.]
- c. 仕事が入ったので、旅行の計画がころんでしまった。
[I received work, so my plans for travel fell.]
- d. 台風で庭（にわ）の木がころんだ。
[During the typhoon the trees fell.]

2. 指示（しじ）

[instruction]

- a. 「この書類（しよるい）、30倍コピーしておいて」と秘書（ひしょ）に指示した。
[To the secretary he instructed, "Make thirty copies of this document."]
- b. 「この作文を見ていただけませんか」と先生に指示した。
[The teacher instructed, "Could you look at this essay?"]
- c. 「あした映画を見に行こうよ」と友達（ともだち）に指示した。
[My friend instructed, "Let's go to see a movie tomorrow."]
- d. 「トイレはどこにありますか」と店員に指示した。
[The store clerk instructed, "Where is the bathroom?"]

APPENDIX C

Reading-to-Learn *Assessment*

Comprehension Section: Global Test

Introduction

In the current political and economic climate, many countries are attempting to prepare their citizens with the knowledge and skills necessary for working and communicating in a global environment.



In this activity, we will explore a Japanese author's perspective about Japan's goals for globalization. Afterwards, you will reflect on how it compares with your own cultures' goals for globalization.

Overview of Activity

In this activity, you will complete the following sections:

- Comprehension (20-30 minutes)
- Cultural Comparison **or** Language Practice (30 minutes)
- Reflective Responses (30 minutes)

Please manage your time accordingly.

[Open the "Aruku" bilingual dictionary in a new tab](#)

Comprehension

Instructions: Read the following passage and think about the relationship between globalization and foreign language skills.

ある商社の社長が商談で米国に行った。英語ができないので日本語でスピーチし、部下が訳した。締めくくりくらいは英語で、と思い、「ワン・プリーズ (One please)」と言って終えた。意味がわからなかった部下が後で社長に聞くと、得意げに「分かんのか。『ひとつ、よろしく』だよ」。ロシア語の同時通訳として知られた作家の故米原万里（よねはらまり）さんが、デビュー作で紹介している。実話だという。耳にした方もおられるかもしれない。



いま「グローバル人材」の育成がしきりと叫ばれているが、この社長は当てはまりそうにない。英語を自在に操る。それは今日、有為な人材と見なされるための必須の条件であるかのようだ。政府の教育再生実行会議は、先日「世界に打って出る人材」をつくることを提言した。そのために英語を小学校の正式な教科にすることなどを唱えている。

ただ、米原さんは、語学学習で最も重要なのは実は母国語だと書いている。日本語が下手な日本人はその下手な日本語よりもさらに下手にしか外国語が身につかない。とすれば、グローバルな人材を育てるためには、外国語教育以前に母国語教育を充実させるということしかないのだろうか。

出典: 2013 年 6 月 1 日 朝日新聞 天声人語 (一部改変)

Short Answer Questions

1. 本文によると、社長はグローバル人材の脳力がありますか。なぜですか。("はい" or "いいえ" + 1 phrase or sentence) According to the passage, does the company president have the skills of a globalized citizen? Why?
2. 本文によると、グローバル化にとって「有為な人材」になるためにはどんな能力が必要ですか。(1 phrase or sentence) According to the passage, what does the average Japanese person consider a required skill among "Ui na Jinzai"?
3. 日本の政府は、グローバル人材を増やすために、どのような教育を目指しているでしょうか。(1 phrase or sentence) In order to increase the number of "global citizens," what type of educational policies is the Japanese government aiming for?

4. 筆者の意見では、外国語が上手になるために必要なことは何ですか。また、その理由は何ですか。 (1 phrase or sentence) In the author's opinion, what is needed to become skilled at a foreign language? Why is this so?

English Summary Task

Please summarize passage, including the following contents:

- What is the theme of this passage
 - What are the perspectives of the author about globalization?
 - What are Japanese mainstream perspectives about globalization?
 - What is the main point of this passage?
- (100 – 150 characters).

Note: Students are able to read the passage while answering questions

Comprehension Section: Overwork Test

Introduction

In developed countries such as Japan and the U.S., many people are having trouble finding an appropriate work-life balance. Why is this? Let's figure out why this is the case.



In order to explore this societal problem, let's compare our own cultural views about overwork with Japan.

Overview of Activity

In this activity, you will complete the following sections:

- Comprehension (20-30 minutes)
- Cultural Comparison **or** Language Practice (30 minutes)
- Reflective Responses (30 minutes)

Please manage your time accordingly.

Open a bilingual dictionary in a new tab

Comprehension

Instructions: The following passage describes a Japanese perspective about work culture in Japan. Think about how this perspective compares with the culture you're most familiar with.

働き過ぎの日本

米国の会社に転職した日本人ビジネスマンがいた。社員を猛烈に働かせることで有名な会社で、上司はこう述べた。「明日から週6日、1日に12時間ずっと働いてもらいたい。それでいいかな?」。驚いた日本人は「ちょっと待ってください」と言って、続けた。「私ははるばる日本から来たんですよ。それなのにそんなに働かせるなんてあんまりです」。 長時間労働に日本人が慣れているわけではなさそうだ。



日本より短めに働き、休みも多めに取る欧州に転勤したら、どうなるか。そんな調査が行われた。この調査から、さまざまなことがわかった。たとえば、日本で週60時間働いていた人の多くが、欧州では10時間近く労働時間を減らしたという。また、欧州に長くいればいるほど、日本人以外の友人が多ければ多いほど、日本人は休暇を多く取るようになる傾向もあった。朱に交われれば赤くなるというわけか。やはり、長時間労働に日本人が慣れているわけではないようだ。この二つの例は、働き方を改めるのは可能だと教えてくれる。



最近ようやく、政界や経済界で残業を減らそうという声が大きくなってきた。痛ましい過労自殺があった会社では、違法な長時間労働をさせることになった責任を取って社長が辞任した。おとといの記者会見では反省を込めて「人の時間は無限ではない」との言葉が出た。そんな当たり前のことを確認しなくてすむ社会であってほしい。心のゆとりがなくなってきたのに働いて来た日本人も多いのではないだろうか。日本人の労働環境を改善するために振り返る時間も持ちたい。

出典: 2016年12月30日 朝日新聞 天声人語 (一部改変)

Short Answer Questions

1. 米原万里さんはどのような話を紹介していますか。(1 phrase or sentence)
米原(よねはら)万里(まり)さんはどのような話(はなし)を紹介(しょうかい)していますか。What type of story is being introduced by Yonehara Marisan?
2. 本文によると、社長はグローバル人材の能力がありますか。なぜですか。("はい" or "いいえ" + 1 phrase or sentence)

本文（ほんぶん）によると、社長（しゃちょう）はグローバル人材（じんざい）の能力（のうりょく）がありますか。なぜですか。 According to the passage, does the company president have the skills/ability of a global citizen? Why or why not?

3. 本文によると、グローバル化にとって「有為な人材」になるためにはどんな能力が必要ですか。（1 phrase or sentence）

本文（ほんぶん）によると、グローバル化（ぐローばるか）にとって「有為（うい）な人材（じんざい）」になるためにはどんな能力（のうりょく）が必要（ひつよう）ですか。 According to the passage, what type of ability(s) is needed to become a "Ui na jinzai"?

4. 日本の政府は、グローバル人材を増やすために、どのような教育を目指しているでしょうか。（1 phrase or sentence）

日本の政府（せいふ）は、グローバル人材（じんざい）を増（ふ）やすために、どのような教育（きょういく）を目指（めざ）しているのでしょうか。 In order to increase the number of "global citizens," what types of education is the Japanese government aiming for?

5. 筆者の意見では、外国語が上手になるために必要なことは何ですか。また、その理由は何ですか。（1 phrase or sentence）

筆者（ひっしゃ）の意見（いけん）では、外国語（がいこくご）が上手（じょうず）になるために必要（ひつよう）なことは何（なん）ですか。また、その理由（りゆう）は何ですか。 In the author's opinion, what is necessary to become skilled at foreign languages? Why?

English Summary Task

Please summarize passage, including the following contents:

- What is the theme of this passage
 - What are the perspectives of the author about globalization?
 - What are Japanese mainstream perspectives about globalization?
 - What is the main point of this passage?
- (100 – 150 characters).

Note: Students are able to read the passage while answering questions

APPENDIX D

Reading to Learn Assessment

Analysis (+ Scaffolding Condition): Globalization

Comparison Chart

1. *Instructions: This comparison chart is OPTIONAL, but may help you reflect on differences and similarities between your own culture and Japanese culture as depicted in the text. All answers can be in **ENGLISH or JAPANESE**.*

	日本文化 Japanese culture (based on passage information)	自国文化 Your own culture
週に何時間ぐらい働きますか？ How many hours a week?		
長時間労働と心のゆとりとどんな関係がありますか。What is the relationship between working long hours and having “room to breathe?” Your culture's views		
社会にとって長時間労働の良い影響は何ですか。On a societal level, what positive influences are there from working long hours?		
長時間労働には、どんな社会問題が関連していますか。What societal problems have arisen from overwork?		

Open-ended Questions

2. あなたの国では、長時間働くことが大切だと思われていますか。(はい・いいえ) 例を使って説明してください。(1-3 sentences) *In your country, is it considered important to work long hours? Please explain using an example.*

3. あなたの国・社会も働き方を改めることが可能だと思いますか。それはなぜですか。(1-3 sentences) *Does your country have the potential to change its views toward overwork? Why or why not?*
4. あなたは、労働環境を「振り返る時間」は大切だと思いますか。なぜですか。(1-3 sentences) *Do you think that people working in your country value having time to reflect? Why or why not?*

Analysis (+ Scaffolding Condition): Overwork

Comparison Chart

2. *Instructions: This comparison chart is OPTIONAL, but may help you reflect on differences and similarities between your own culture and Japanese culture as depicted in the text. All answers can be in **ENGLISH or JAPANESE**.*

	日本文化 Japanese culture (based on passage information)	自国文化 Your own culture
週に何時間ぐらい働きますか？ How many hours a week?		
長時間労働と心のゆとりとどんな関係がありますか。What is the relationship between working long hours and having “room to breathe?” Your culture's views		
社会にとって長時間労働の良い影響は何ですか。On a societal level, what positive influences are there from working long hours?		

APPENDIX E

Reflection Tasks

Target Culture Perspective

*Instructions: In this section, express what you have learned about **Japanese culture** and in what way(s) your understanding has changed. Your answers will be scored based on the following rubric:*

Category	Description	Scoring Guide
Prior Knowledge	States previous understanding of Japanese views towards globalization/English education or overwork, including any misconceptions	0- none 0.5- implies what they thought/knew before 1- <u>explicitly</u> states (e.g., 読む前に...)
Learn	States what was learned about Japanese views toward global citizenship or overwork * indicates they learned something, thought about something, or have a new opinion	0- none 1- present but not explicitly stated or explained 2- <u>explicitly</u> states & explains one factor (from text or prior cultural knowledge) that influenced their conclusion 3- <u>explicitly</u> states & explains two+ factors that influenced their conclusion
Diversity	Addresses the diversity of views held within Japan	0- none 1- implied 2- present with an <u>example</u> 3- present with two+ <u>examples</u>
Relationship	Explains a relationship between Japanese cultural values or beliefs and a societal behavior	0- none 1- restates a <u>relationship</u> mentioned <u>within the text</u> 2- states a <u>relationship beyond what was mentioned in the text</u> , but no explanation OR implies another relationship, but not explicit 3- explicitly states a <u>relationship beyond the text</u> AND <u>explains in detail or with example</u>
Text Reference	Makes at least one reference to information from the passage, citing relevant text information	0- none 0.5- implied restating key ideas from the text 1- <u>explicit</u> , using phrases like 'According to...' or by using exact phrasing as text
Language	Sentence-level coherence: Each sentence is not difficult to understand (small errors okay)	0- incoherent 0.5- understandable, but requires effort 1- understandable

1. 本文をもとに日本人の長時間労働の考え方についてどんなことが分かりましたか。例を使って説明してください。(4-6 sentences) From the passage, what new insights have you gained about Japanese people's attitudes towards overwork? Please explain using an example.

2. 「働きすぎ」に対しての日本文化と自国文化の考え方を比較しました。この経験はあなたのこれから先の日本人とのコミュニケーションにどのように影響しますか。(4-6 sentences)
You compared attitudes towards overwork between Japanese culture and your own culture. How might this experience affect the way you interact with people from Japan?

Reflection on Own Culture

*Instructions: In this section, express what you have learned about **your own** culture, and in what way(s) your understanding has changed. Your answers will be scored based on the following rubric:*

Category	Description	Scoring Guide
Prior Knowledge	States previous views towards globalization/English education or overwork, including any misconceptions	0- none 0.5- implies what they thought/knew before 1- <u>explicitly</u> states (e.g., 読む前に...)
Learn	States change in own view toward global citizenship or overwork * indicates they learned something, thought about something, or have a new opinion	0- none 1- present but not explicitly stated or explained 2- <u>explicitly</u> states & explains one factor (from text or prior cultural knowledge) that influenced their conclusion 3- <u>explicitly</u> states & explains two+ factors that influenced their conclusion
Compare	Compares text information with relevant personal experiences, or other background knowledge about own culture	0- none 1- implied 2- present with an <u>example</u> 3- present with two+ <u>examples</u>
Relationship	Explains a relationship between each culture's values or beliefs and their societal behaviors	0- none 1- restates a <u>relationship</u> mentioned <u>within the text</u> 2- states a <u>relationship beyond what was mentioned in the text</u> , but no explanation OR implies another relationship, but not explicit 3- explicitly states a <u>relationship beyond the text</u> AND <u>explains in detail or with example</u>
Text Reference	Makes at least one reference to information from the passage, citing relevant text information	0- none 0.5- implied restating key ideas from the text 1- <u>explicit</u> , using phrases like 'According to...' or by using exact phrasing as text

Language	Sentence-level coherence: Each sentence is not difficult to understand (small errors okay)	<i>0- incoherent</i> <i>0.5- understandable, but requires effort</i> <i>1- understandable</i>
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3. 本文の情報はあなたの長時間労働に対する考え方にどのように影響しましたか。例を使って説明してください。(4-6 sentences) How has information from the passage influenced your attitudes and thoughts towards overwork? Please explain using an example.

4. 本文を読んで自国文化の長時間労働の考え方についてどう思いましたか。日本と自国の考え方を比較して説明してください。(4-6 sentences) Since reading the passage, what have you reflected on about your own culture? Please compare views towards overwork among people in Japan and your country.

APPENDIX F

Student Questionnaire and Interview Questions

Purpose:

1. To collect feedback from students about the difficulty and usefulness of each part of the culture-learning module
2. To see how familiar students are with integrated reading and culture-learning activities

The following ratings concern all sections and tasks in the culture learning module:

Clarity	
How clear were the learning objectives?	Likert Scale
How clear were the instructions?	Likert Scale
What is your understanding of the purpose of the reading and culture-learning tests? (feel free to answer honestly)	Open-ended
Usefulness	
The technology-enhanced features of the learning modules (e.g., hyperlink dictionary definitions, bilingual dictionary, feedback)	Likert Scale
I found the topics in the reading passages interesting.	Likert Scale
Difficulty	
How difficult were the reading passages?	Likert Scale
How difficult was it to answer the comprehension questions?	Likert Scale
How difficult was it to draw connections between the reading passage and your own cultural knowledge/experiences?	Likert Scale
Classroom	
Were the activities in reading and culture learning tasks similar to any of activities in your Japanese class? If so, which ones?	Open-ended
What was the most challenging part of the reading and culture learning tests?	Open-ended
Any other comments?	Open-ended

APPENDIX H

Protocol for Coding Prior Knowledge References

Concepts Coded as Prior Knowledge of Culture or Personal Experiences:

1. **Own Culture's Values/Practices:** concepts related to US culture or students' home culture's values and practices
 - **Example:** 中国人はたいてい外国のほうが強いから、自分にも強くなるために、私たちは英語を勉強しなければならないと思います “Chinese people [think] foreign countries are strong, so to make ourselves strong, we [think] we have to study English.”
2. **Japanese Values/Practices*:** concepts related to collectivist cultural values, helping the group, hierarchical relationships, or other mainstream Japanese values.
 - **Example 1:** 自分を考えずに会社のために仕事を頑張っている。 “Without thinking of oneself (Japanese people) do their best for their company.”
 - **Example 2:** 私のためだけでなく、会社で働いているのみんなのためにこの大問題について話さなければ、全員の顔を潰したり、自殺する人はもっと多くなる “Talking about the huge problem of working not for yourself, but for everyone in the company, everyone will be embarrassed and the number of suicides will increase even more.”
3. **Personal Experiences:** information connected to a prior experience or clear source in the students' past:
 - **Example:** 私は小さい時から日本に行って、いつも日本人が私に英語を話したいそうです。みんな英語を習いたいそうです。日本人は外国人にすごくやさしいです。 “From the time I was young I went to Japan, and Japanese people always spoke to me in English. It seemed that everyone wanted to learn English. Japanese people are very kind to foreigners.”
4. **Simple Comparisons:** statements indicating that students have activated knowledge of their own culture by stating if they are similar or different, usually without elaboration.
 - **Example:** アメリカに、それはとても大切な問題なんですけど、日本より、大切じゃないとおもいます “In the US it's a great problem, but not as bad as Japan.”

*Note: Since students' remarks about Japan were sometimes inaccurate or overgeneralized, raters discussed unclear cases.

The following expressions were not counted as Prior Knowledge:

1. Stating what their country or nationality is without elaboration

- **Example:** 私の国は中国です “My country is China”

2. Evaluative Comments or Predictions

- **Example 1:** ...よくないです “... isn’t good”)
- **Example 2:** 改めると思います “I think it can reform.”

3. Hypothetical situations or Desires

- **Example:** いつか母国語ほど日本語を自在に操るようになりたい “One day I’d like to speak Japanese as well as I do my native language.”

4. Logic or Common Sense (that did not include any reflection on culture)

- **Example 1:** 働き過ぎたら酷い目に会う “If you work too hard, you will have a bitter experience.”
- **Example 2:** 労働文化が様々な場合で見えてもそれに反対する声がないというわけではありません “Even when looking at overwork culture in different situations, it doesn’t mean that there are no people complaining against it.”

5. (Over)generalizations and Guesses About Japan

- **Example 1:** 日本人はとってもまじめなようだ。そして、もちろん気力が強いだ。 “Japanese people seem very disciplined. And of course, their resolve is strong.”
- **Example 2:** 日本人と違いのは、中国人は残業が嫌いですから、毎週残業をするのは絶対だめです “The difference with Japanese people is that Chinese people hate overwork and doing overwork everyday is definitely bad.”
- **Example 3:** 日本人の英語は大抵悪いでしょう。そして、英語を教えることもまだ上手ません “Japanese people’s English is overall bad. Also, they’re still bad at teaching English.”

6. Personal Interests/Goals not related to own culture

- **Example:** 実は日本の文化に興味がなくアメリカの文化にも興味がないです。そして、日本とアメリカの文化に興味がないことはなくても民さんは尊敬してもらいます。 “Actually, I don’t have any interest in Japanese culture or American culture. And even without interest in Japanese and US culture, everyone respects me.”