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## Language Learning and Metacognition: An Intervention to Improve Language Classrooms


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**LANGUAGE LEARNING AND METACOGNITION: AN INTERVENTION  
TO IMPROVE LANGUAGE CLASSROOMS**

A Masters Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Psychology

By

Rebecca Elise Knoph

August 2017

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Psychology

Missouri State University, August 2017

Master of Science

Rebecca Elise Knoph

**ABSTRACT**

In the USA, the trend of increase in foreign language enrollments at the college level has suddenly begun to decline since 2009, despite the notion that learning multiple languages is becoming essential for effectively communicating with others from diverse native language backgrounds. This new decline may be due in part to inefficient and outdated foreign language courses. The current study examined the effect of how we assess our current knowledge and learning techniques (metacognition) on educational outcomes in hopes to improve the effectiveness of the university classrooms. College students were exposed to new metacognitive strategies that could benefit their language learning throughout the fall 2016 semester. Specifically, students were presented with new information every other week to improve their vocabulary building, listening skills, and writing skills. Hierarchical multiple linear regression provided evidence that teaching students about metacognition and effective metacognitive strategies could benefit university language learners.

**KEYWORDS:** language learning, metacognition, motivation, academic achievement, structured learning

This abstract is approved as to form and content

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Erin M. Buchanan, PhD  
Chairperson, Advisory Committee  
Missouri State University

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August 2017

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In the interest of academic freedom and the principle of free speech, approval of this thesis indicates the format is acceptable and meets the academic criteria for the discipline as determined by the faculty that constitute the thesis committee. The content and views expressed in this thesis are those of the student-scholar and are not endorsed by Missouri State University, its Graduate College, or its employees.

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## INTRODUCTION

Although the value of learning multiple languages affects many Americans, the current USA school system does not generally require nor support multilingual learning from an early age. Instead, the learning of foreign languages occurs later in adult life in structured classrooms, which may not be efficient in facilitating long-term learning. The current study aimed to evaluate the possibility of increasing the effectiveness of learning in university classrooms by combining language learning and metacognitive awareness for native speakers of English learning different target languages.

### **Metacognition**

Commonly, metacognition is known as "thinking about thinking", although John Flavell coined the term as "cognition about cognitive phenomena" (Flavell, 1979, p. 906). Since this time, researchers have debated what metacognition is comprised of and what terms should be synonymous, such as "self-management, metamentation, meta-learning... [and] metacomponents" (Pintrich, Wolters, & Baxter, 2000; Raoofi, Heng Chan, Mukundan, & Rashid, 2014; Veenman, Van Hout-Wolters, & Afflerbach, 2005). Educational and linguistic researchers have expanded the original definition of metacognition to encompass how it is used in the current study: "Awareness and management of one's own thought" (Kuhn & Dean, 2004); "The monitoring and control of thought" (Martinez, 2006); and especially "Thinking about the learning process, planning for learning, monitoring... while [learning] is taking place, and self-evaluation after... learning" (O'Malley & Chamot, 1990, p. 8). Many researchers have come to

similar conclusions about a definition comprising of planning, monitoring, and evaluating (Schraw, Krippen, & Hartley, 2006; Raoofi et al., 2014; Pintrich et al., 2000).

**Components of Metacognition.** The exact components of metacognition are still widely debated (Oxford, 1990; Hsiao & Oxford, 2002; Pintrich et al., 2000), but the current study incorporated the three-part definition given by Cross and Paris (1988). Specifically, the current study considered the definition within the language-learning modality defined by O'Malley and Chamot (1990), and later by Schraw et al. (2006): declarative knowledge, procedural knowledge, and conditional knowledge. Declarative knowledge, in essence, is knowledge that can be declared or expressed, such as the rules of spelling: "*i* before *e* except after *c*". Declarative knowledge is the awareness of certain cognitive factors that may affect the ability to complete a cognitive task, such as finding a book that is at an acceptable reading level based on the Lexile Level (Cross & Paris, 1988; Schraw et al., 2006; Kuhn & Dean, 2004; O'Malley & Chamot, 1990). Procedural knowledge is the knowledge of cognitive strategies or skills to improve task completion, such as efficient reading strategies or knowing how to generalize specific spelling rules to novel utterances (I know "*i* before *e* except after *c*", and being presented with the new word, *relieve*, I know that *i* needs to come first). Procedural knowledge requires extensive practice and is acquired very gradually, particularly in the linguistic modality (O'Malley & Chamot, 1990; Kuhn & Dean, 2004; Schraw et al., 2006). Consequently, declarative knowledge tends to be explicitly taught in the classroom while only some procedural instruction takes place. Then, a "passing of the baton" of responsibility from teacher to learner occurs for conditional knowledge, which is rarely taught in the classroom. Conditional knowledge is the understanding of when (in what conditions) to

use certain skills and strategies, and why (Schraw et al., 2006; Cross & Paris, 1988).

Conditional knowledge can follow an “if-then” statement: “*If* the goal is to comprehend a written text and I do not know a word’s meaning; *then* I will try to infer the meaning from context” (O’Malley & Chamot, 1990).

Cross and Paris (1988) then suggested defining metacognition that is self-managed, or implicit (understanding that is not plainly, explicitly expressed but instead inferred). Implicit metacognition, they proposed, should be categorized as planning, regulating, or evaluating. Cognitive planning refers to selecting which of the strategies available to learner will be best suited for the task, similar to conditional knowledge. Regulating (or monitoring) refers to being aware of task performance during the task and tracking the progress you make as you make it. Evaluating involves assessing task performance at the conclusion and considering how to complete similar future tasks based on the performance. The theories and definitions by Cross and Paris (1988) have continued to be found in subsequent published works (O’Malley & Chamot, 1990; Pishghadam & Khajavy, 2013; Chamot, 2005; Veenman et al., 2006; Schraw et al., 2006; Schraw & Moshman, 1995). Although implicit metacognition, by definition, cannot be assessed explicitly through the current study, participants were presented with new strategies and asked to practice monitoring and evaluating the effectiveness of the strategies, and then report on perceptions of usefulness later.

Other researchers have suggested anywhere from two to six components for metacognition—many broken down into subcomponents (Oxford, 1990; O’Malley & Chamot, 1990; Chamot, 2005; Pintrich et al., 2000). Thus, most of the teachings in the current study did not focus on the concrete categorizations of different types of

metacognition, but rather focused on metacognition as a whole within the context of language learning domains, such as how to apply all types of metacognition to listening strategies or vocabulary strategies.

**Metacognition Development and Instruction.** Originally, it was theorized that young children did not have the ability to use metacognition, as they are neither capable of abstract thinking nor systematic planning (Flavell, 1979). However, recent studies have begun to discover that children are able to regulate their thinking at a rudimentary level around the age of four (Goh, 2008; Schraw & Moshman, 1995; Veenman et al., 2006; Brown, 1978). Children as young as six can begin to accurately reflect on their cognitive abilities, and by pre-adolescence, most have significantly improved cognition through planning due to maturity, higher-order thinking, and the development of the pre-frontal cortex (Goh, 2008; Schraw & Moshman, 1995). Conversely, cognitive monitoring and regulation can be late to develop and may never fully develop for all adults (Schraw & Moshman, 1995; Goh, 2008). Generally, some strategies may be learned explicitly (and thus taught through interventions) but most of metacognition requires implicit and informal strategies through practice (Schraw et al., 2006).

Fortunately, researchers *have* found metacognition to be teachable. For example, Cross and Paris (1988) discussed an intervention for 171 elementary students to improve reading comprehension. Students were instructed on novel reading strategies (i.e. strategies not used by these students before), specifically those focusing on the explicit form of metacognition: declarative knowledge (“*what* factors influence reading”), procedural knowledge (“*how* skills operate and are applied”), and some cognitive planning/conditional knowledge (“understanding *when* particular strategies should be

applied, and *why* they affect reading”; Cross & Paris, 1988). Students receiving strategy instruction performed significantly better than the control group, especially in the areas of task difficulty evaluation, goal planning, and goal monitoring (Cross & Paris, 1988).

Moreover, a meta-analysis comprised of 20 studies and over 1,500 students completed by Haller, Child, and Walberg (1988) proposed that metacognitive instruction—especially implicit metacognition—can have immense effect on reading comprehension for children of varying ages (mean effect size  $d = 0.71$ ). They suggested techniques such as: teaching awareness of inconsistency in reading (the textual-dissonance approach); using self-questioning to monitor comprehension; and using self-reflection to regulate speed of reading (Haller et al., 1988). Likewise, Dignath, Buettner, and Langfeldt (2008) completed a meta-analysis comparing metacognition and learning outcomes in all disciplines for children in first through sixth grade. The mean effect size for the 48 studies was  $d = 0.73$ ; again, a sizable effect that showed that metacognitive strategies for children can be learned and can have a positive impact on a variety of learning outcomes simultaneously. A more recent meta-analysis conducted by Raoofi et al. (2014) came to similar conclusions, but was unable to calculate effect sizes due to the qualitative research analyzed in their study. Instead, most studies focused on interviewing young students and their opinions of using metacognition, or asking students to think aloud while researchers recorded their thoughts. Similar to the quantitative results of previous researchers, Raoofi et al. (2014) found that children enjoyed using metacognitive strategies and found their learning to be more efficient and long lasting in most educational areas than when they did not use metacognitive strategies.

Moreover, Kramarski and Mevarech (2003) discussed the effects of metacognitive instruction of over 380 teenage students, specifically in their mathematical skills and reasoning. Students receiving metacognitive instruction significantly outperformed their peers in a multitude of ways, such as interpreting graphs, using logic to support arguments, and transferring mathematical logic from one concept to another ( $p < .05$ ; Kramarski & Mevarech, 2003). Similarly, Wolters (2004) found that, for seventh and eighth grade students enrolled in a variety of mathematics courses, practicing study strategies was correlated more strongly with final grade than using cognitive strategies ( $r = .21$  and  $r = .11$ , respectively;  $p < .05$ ). When assessing structural equation modelling for 800 undergraduates, Vrugt and Oort (2008) also found a moderate relationship between use of general metacognitive strategies and introductory psychology exam scores ( $\beta = .20$ ).

While empirical evidence suggests that metacognitive instruction can provide benefit to learners in most areas, it appears that teachers are relatively unaware of metacognition as a concept (Veenman et al., 2006). Further, the majority of teachers who *were* aware of the concept of metacognition did not feel confident to instruct students on how to develop and use metacognitive strategies (Veenman et al., 2006). However, most researchers agree that explicit instruction in metacognitive strategies is not only possible, but also *preferred* for metacognitive instruction. Schraw et al. (2006) suggested that cognitive and metacognitive strategies should be presented in explicit form to students. A number of researchers also recommended that giving an explanation as to *why* a strategy is preferred or beneficial could increase motivation to use said strategy. Providing an explanation may increase practice with the strategy independently of the

instructor (Kramarski & Mevarech, 2003; Cross & Paris, 1988). Therefore, most exposure to interventions in the current study focused on the explicit strategies that can be learned and improved upon by participants, along with benefits for using the novel strategies. Cross and Paris (1988) indicated that at least some portion of metacognitive training should involve implicit and self-managed learning, such as how to monitor and evaluate cognitive tasks. Because implicit learning could not occur during the small windows for interventions, one-week breaks between intervention exposure allowed for participants to practice putting strategies into effect in the most efficient way for each participant's individual learning preferences, target language, and course level.

Limited research has focused on the use of metacognitive strategies specifically within the language-learning domain as a whole, and especially of young adults learning in the university setting. Chamot (2005) mentioned the downfall of research relating to strategy instruction for language learners after the surplus of data about the "good learner". Based on the meta-analysis conducted by Raoofi et al. (2014), only one study had considered young adults learning a new language at the university level. Pishghadam and Khajavy (2013) studied 143 Persian students learning English ranging in ages from 10-40. After measuring participants' intelligence and metacognitive awareness on the Metacognition Awareness Inventory (MAI), Pishghadam and Khajavy (2013) found that scores on the MAI could account for 17% of the variance in standardized grades after controlling for intelligence. However, this study did not control for age, despite the wide range reported by participants.

Raoofi et al. (2014) reported that few studies exist on the teaching or use of metacognitive strategies for target languages other than English. Additionally, most

studies that do exist focus on one modality of language skills (reading, writing, speaking, or listening). The current study aimed to shed light on how native speakers of English might benefit from metacognitive strategies when studying different foreign languages offered at the university level.

### **Language Learning**

When a child begins to acquire a language naturally through immersion, the pattern of acquisition is different from that of an adult in a structured environment (Birdsong, 1999). Therefore, a distinction must be made: language learning is separate from language acquisition. Acquisition is the product of spontaneous, subconscious, implicit effort children use when learning a native or multiple native languages (Birdsong, 1999; Oxford, 1990; Krashen, 1982). Learning a new language requires conscious, explicit effort. (Krashen, 1982). The current study focused on language *learning*; specifically, the conscious effort made by adults in structured language courses at the university level. Structured language learning involves the formal, explicit teaching of grammar rules, vocabulary, reading, writing, listening, and speaking in the classroom. While those acquiring language early in life usually reach native proficiency, learning a language later in adulthood rarely produces the same native-like fluency.

**Cognitive Benefits of Learning.** Becoming fluent (native-like or otherwise) in two or more languages at *any* age can be beneficial to cognition outside of the new language skill itself. Although it may seem counterintuitive, experimental studies have concluded that, after the initial few years of learning, competency in a second language does not impede academic growth (Jarvis, 2003; August, Calderon, & Carlo, 2002).



Instead, learning a second language can improve academic growth in areas *outside* of target language (TL) instruction, such as native language skills and problem solving skills (Garfinkel & Tabor, 1991; Tabor, 1987; Eddy, 1981).

Garfinkel and Tabor (1991) compared native English speaking students in grade 5 who had received advanced Spanish training in reading to those who only received basic Spanish training in speaking and listening. The authors discovered that those with extra training scored significantly higher ( $p < .01$ ) in *English* literacy on the Stanford Achievement Test (SAT) than those without the extra training—especially the students who had the most gains to make (i.e., lower performers; Garfinkel & Tabor, 1991).

In addition to the modern language instruction, instruction in classical languages can also lead to significant improvements. Masciantonio (1977) found that students in grade 6 classrooms who received 30 minutes of daily Latin training had significant academic gains compared to their counterparts (classrooms which received no Latin training) for many skills: word knowledge, reading, language, spelling, math computation, math concepts, math problem-solving, science, and social studies. Students who received Latin instruction had an average gain of 8 months on their control-group peers in each of these areas.

**The Role of Motivation in Language Learning.** Researchers have dichotomized general “motivation” into smaller constructs, such as internal (motivated by inner motives, such as pleasure) versus external (motivated by outer motives, such as money). However, the process of learning a language is different from the process of learning nearly anything else. Language learning involves not only learning a new skill, but also understanding the new skill within the context of a new culture (for instance,

learning new grammar structures, novel pronunciations, or the appropriate contexts for specific words). It is because of the cultural element that language learning and motivational research can dichotomize motivation into integrative versus instrumental motivation instead of the more common internal versus external (Gardner, 2007).

Integrative motivation refers to the learner being motivated with the hopes of eventually integrating into a new society, but can be experienced differently by individual learners (Gardner, 2007). For instance, some learners may have integrative motivation in the sense that they feel open to learning in other cultural contexts—simply lacking ethnocentrism as opposed to being motivated to uproot and become part of the target language society (Gardner, 2007). For the university student who is learning a language, we may see integrative motivation as the desire to learn a host language before spending a semester abroad.

Instrumental motivation, conversely, refers to the learner being motivated with the hopes of using the new language skill as an instrument to achieve some other gains outside of integration (Gardner, 2007). Learners may experience instrumental motivation in the form of practicality, such as seeking employment or improved grades. Most likely, the university student who enrolls in a foreign language course will exhibit instrumental motivation as the desire to pass a mandatory language class and graduate.

However, an individual's motivation to study a foreign language is dynamic and complex, comprising of various internal and external elements, which are not always adequately captured by dichotomies (Dornyei, 2001). For example, a common misconception is that instrumental and integrative motivation exist on a continuum (i.e., individuals can only exhibit one type of motivation). Instead, individuals exhibit some

amount of *both* types of motivation (such as a student preparing to study abroad, but needing to pass the class to be admitted to the host school). Even specific reasons for learning a language can inherently contain both integrative and instrumental motivation, such as the desire to have the skills to converse with native speakers in the TL (the desire for the skill would be instrumental, but the desire to talk to others would be integrative). Integrative and instrumental motivation are also highly correlated ( $r = .57$ ; Gardner, 2007)—so it is nearly impossible to truly separate the two.

A second misconception is that one type of motivation is preferred over the other type of motivation. Although intrinsic motivation is considered a more effective motivator in general learning as opposed to extrinsic motivation, the same effect is not seen in language learning. Instead, the sum of *both* motivations seems to matter the most for language learning in the initial stages. Gardner (2007) found that both instrumental and integrative motivation were significantly correlated (at  $p < .01$ ) with final grade for Spanish students learning English ( $r = .22$  and  $.32$ , respectively). Wechsumangkalo and Prasertrattanadecho (2004) found that high-achievers in English proficiency contained higher levels of both instrumental and integrative motivation, and low-achievers in English proficiency contained only some instrumental motivation. However, they too were unable to ultimately distinguish between the two types of motivation when they expressed, “among reasons [for learning English] determined by some students, some [reasons] cannot be classified as either integrative or instrumental [motivation]” (p. iii). When it comes to learning a new language, the intensity of motivation to learn as a *whole* seems to be what affects the outcome of proficiency. Dornyei (2001) claimed that motivation to learn a foreign language is the key predictor of linguistic success—above

linguistic ability and general intelligence. Thus, it seems that motivation is an integral part of language learning success that must be considered separately from metacognition.

### **Persistence**

Student retention has been a concern for educators and universities, especially since the downward trend of enrollment (Goldberg, Looney, & Lusin, 2015). Universities are constantly searching for new ways to keep students engaged and enrolled in courses, including living-learning communities, service-learning classrooms, welcoming committees, and immense resources on and off campus. Empirical evidence has found many predictors for general persistence (freshmen enrolling in the next year of college), such as enrollment in an orientation course, high school GPA, and age ( $p < .01$ ; Murtaugh, Burns, & Schuster, 1999). Black (2008) found that participation in self-regulated learning was able to discriminate between first-year college students persisting versus dropping out—correctly predicting 65% of participants ( $\lambda = .957, F(15, 657) = 1.96, p = .02$ ). It is of interest to educators to continue to find empirical evidence for improving retention rates of university students, thus the current study aimed to discover if exposure to metacognitive strategies may also have some predictability on language course retention.

Unfortunately, limited empirical work has focused on persistence of learning a language within the university setting. The foreign language class is different from other university classes in that students must not only learn the new skill (language proficiency) but also must learn in the new linguistic territory (Gardner, 2007; Emmitt, Pollock, Komesaroff, 2003). The task of learning a new language can be daunting and

involves processes not exercised in other subject areas. Additionally, mastering a new language can be a long and grueling process, which requires sustained effort over many years. For example, Schmitt (2010) and Nation and Webb (2011) suggested that achieving basic conversational ability requires working knowledge of approximately 2,000 words (which arguably, takes between 800 - 1,000 hours of instruction; Schmitt, 2010). Thus, students may need more than the external motivation to pass a single class or fulfill university requirements to achieve conversational ability. The current study intended to find a link between metacognitive strategies and proficiency/learning outcomes, since such outcomes relate to students wanting to continue their language learning endeavors.

### **Metacognitive Strategies within Language Learning**

Although metacognition and second language learning research remains mostly preliminary, some strategies used to learn our native language (NL) could be transferred to learning our second or target language (TL). For instance, learners can predict the next word in a sentence, use contextual and paralinguistic cues to guess meaning, or evaluate their comprehension and ask for clarification when necessary (August et al., 2002; O'Malley & Chamot, 1990; Wang, Thomas, & Ouellette, 1992; Oxford, 1990). Further, metacognition is a vital part of language learning, as expressed by O'Malley, Chamot, Stewner-Manzanares, Russo, and Küpper (1985, p. 561): "Students without metacognitive approaches are essentially learners without direction or opportunity to review their progress, accomplishments, and future learning directions." O'Malley et al. (1985) assessed the learning strategies most frequently used by successful TL learners

and found that some of the frequent strategies involved metacognition—specifically vocabulary strategies, attentional strategies, and planning strategies that can be used for most domains of language stimuli (reading, writing, speaking, and listening). Moreover, Moir and Nation (2002) found that learners of English that were more aware of their own English abilities (and their own pitfalls) performed significantly better on vocabulary tests than those that were not as metacognitively aware. The current study provided direction and planning as a supplement to the cognitive learning strategies commonly taught in the classroom, and focused on three domains in relation to TL courses: vocabulary, listening, and writing.

**Vocabulary Strategies.** Students recognize that learning more vocabulary words is imperative for their TL growth; thus, vocabulary-increasing strategies are in high demand (Nation & Webb, 2011). One such strategy, the keyword method, is a well-researched mnemonic strategy that aids in immediate recall of vocabulary words. The strategy was originally developed to improve second language vocabulary (Atkinson, 1975; Pressley, Levin, & Delaney, 1982; Kulhavy & Swenson, 1975) such that a student would encounter a new TL word (for instance, *vegg*, the Norwegian word for *wall*) and create a keyword: a word that sounds or looks similar to the novel word (for instance, *egg*). Then, the student would interact the keyword (*egg*) with a mental image to facilitate remembering the meaning of the novel word (for instance, thinking of someone throwing eggs at a wall). O’Malley and Chamot found that strategies, such as the keyword method, allow learners to “capitalize on the inherent meaningfulness of information”, such as connecting *vegg* with *egg* and *wall* (O’Malley & Chamot, 1990, p. 50). Such strategies can be more beneficial than simply trying to recall the information

or using rote memorization (O'Malley & Chamot, 1990; Nation & Webb, 2011).

O'Malley and Chamot (1990) confirmed findings from Kulhavy and Swenson (1975) that participants using the keyword method were able to read a passage and provide missing words from paraphrased sentences better than control participants.

However, empirical evidence for the longitudinal effects of the keyword method is mixed. Wang et al. (1992) discussed that the keyword method is beneficial initially, but that the effects diminish over time and especially when learning abstract words (e.g., *honesty*), as opposed to concrete words (e.g., *church*). Moreover, it was theorized that the long-term gains evidenced by the keyword method might be a testing effect due to using within-groups research designs. Wang et al. (1992) examined this limitation in research by employing a between-groups design, such that participants took either an immediate post-test or a delayed post-test. When studying native speakers of English who were learning Chinese, the authors found that college students who used the keyword method outperformed their peers on an immediate recall test ( $p < .01$ ), but that college students who took only the two-week delayed recall test did not perform significantly different from their control-group peers (Wang et al., 1992). Avila and Sadoski (1996) endeavored to replicate the previous study, but with 11-year-old native speakers of Spanish who learned English target words. Participants who used the keyword method did perform significantly better than their control group counterparts regardless of test (immediate versus delayed test; main effect of study strategy  $p < .001$ ), and participants taking the immediate test performed better than participants taking the delayed test regardless of strategy (main effect for test  $p < .001$ ), but no significant interaction was present (Avila & Sadoski, 1996). The effect sizes for post-hoc tests that compared

participants who used the keyword method to the control condition were  $d = 0.59$  initially and  $d = 2.27$  on the delayed recall test (Avila & Sadoski, 1996).

Due to mixed results for using the keyword method over long periods of time, participants in the current study were advised to use the keyword method initially and gradually move toward committing novel words to memory via context (i.e., by using it in a sentence) and lexical inferencing. Fraser (1999) interviewed adults learning English as a foreign language and discovered that, when participants encountered novel English words, the learners relied solely on contextual clues and lexical inferencing 58% of the time. However, multiple researchers have urged that using context is only effective when the reader knows enough surrounding words to be able to use context (i.e., at least 5,000 words in the TL; Coady, Magoto, Hubbard, Graney, & Mokhtari, 1993; Nation & Webb, 2011; Laufer, 1997). Hirsh and Nation (1992) suggested that comprehending fewer than 95% of the words in a given passage will result in general comprehension failure and inability to use context to correctly make predictions. Nassaji (2003) assessed 21 learners of English from a variety of native languages and found that generally, readers were unable to correctly guess the meaning of true novel words (i.e., not nonwords)—even when 95% of the words in the passage are rated as comprehensible. After controlling for known target words, participants correctly inferred meaning of words only 25.6% of the time. Correct inferences were significantly less than chance based on a chi-square ( $\chi^2(2) = 46.59, p < .001$ ; Nassaji, 2003). Usually, participants were incorrectly assuming semantic relationships between words that lacked such (e.g. assuming *permeate* is related to *meat*; Nassaji, 2003; see: Fukkink, Blok, & de Glopper, 2001; Morrison, 1996; Moore & Surber, 1992; Schatz & Baldwin, 1986).



Further, Huckin and Bloch (1993) proposed that making guesses based on context required two components: first, readers must generate different possibilities for novel word meaning based on known words that behave similarly to the unknown word. For instance, if readers are presented with the nonword *donse* in the sentence, “Please *donse* the flowers to Rose”, readers must first consider multiple possibilities for the meaning (e.g., *give*, *present*, *roll*...). Next, readers must evaluate which hypothesized meaning is most likely correct based on the rest of the sentence. Since flowers are not usually rolled, the hypothesis that *donse* would mean something similar to *roll* can be excluded. Now, readers could correctly conclude that *donse* has some meaning similar to *give* or *present*.

Despite methodological shortcomings of vocabulary methods, the keyword method has been extensively investigated and consistently established as an effective tool for initial recall of new TL words (Nation & Webb, 2011). When combined with the tools to use lexical inferencing for abstract words over time, we expected to see participants able to use such strategies effectively (see: Moore & Surber, 1992; Fukkink et al., 2001). We proposed that by introducing an especially effective method relevant to all learning stages, we could reduce the potential attrition in the current study due to loss of interest in the presented strategies.

**Listening Strategies.** Similar to the three dimensions of metacognitive knowledge, Brown (1978) suggested three metacognitive strategy categorizations for TL comprehension presented to my participants: planning (determining the goals of TL comprehension), monitoring (inspecting progress during the TL task), and evaluating (determining actual success at the end of the TL task) (Brown, 1978; Goh, 2008). Goh (2008) expanded on these three categorizations within the precise context of TL *listening*

comprehension—sometimes considered the most daunting comprehension task (Wimolmas, 2013; Vandergrift, 2004). Goh (2008) suggested that during the planning phase, listeners should set goals and seek opportunities to practice listening. Finding opportunities to listen is not limited to actively seeking out people to converse with, but should at least include authentic materials. Authentic materials are not created with a second language learner in mind, but are instead created within the domain of the TL itself and tend to have faster speech that has less emphasis on enunciation (Gilmore, 2007). Goh (2008) suggested that participants seek out these materials and, if needed, use subtitles as a crutch. Authentic materials would include TV shows, movies, and/or radio shows spoken in or translated into the TL (Gilmore, 2007).

During the monitoring phase, listeners should check for accuracy and assess the chances of meeting the goals established in the planning phase. Finally, listeners should again check for accuracy of listening by drawing on their background knowledge and considering if what they believe they heard sounds logical (Goh, 2008). Participants in the current study were exposed to these same tools.

**Writing Strategies.** Similar to the triadic breakdown of metacognition for comprehension techniques, Chenoweth and Hayes (2001) suggested that TL production should also follow a three-step process: resource, process, and control. Schoonen, van Gelderen, de Glopper, Hulstijn, Simis, Snelings, and Stevenson (2003) then expanded on each of the steps with metacognitive strategies for written production in mind. *Resource* refers to the metacognitive knowledge the writer currently holds, such as how to organize writing thoughts, consider outside resources available when writing, think about the best strategies as an attack plan for writing, or create a rough outline (Schoonen et al., 2003).

*Process* refers to accessing knowledge within the TL constraints and is limited by working memory (Schoonen et al., 2003). This step takes a rough outline or brainstorm of ideas and converts it into a rough draft. Most importantly, Schoonen et al. (2003) emphasized the need for writers to consider the thoughts and ideas they wish to communicate to others *before* considering the restraints of TL proficiency. That is, it is most important to begin with the ideas you wish to communicate, *then* consider how to communicate those ideas—similar to how the native language (NL) writing process occurs. Often, Schoonen et al. (2003) argued, second language learners begin with the words and phrases they can correctly use in their TL and then move towards what ideas can be communicated with only that knowledge. Instead of working from resource to process, second language writers can fall into working from process to resource. Once these two steps—regardless of order—are accomplished, writers can move to the control step. *Control* refers to putting the writing together in an organized, controlled manner. This step transforms a rough draft into a final, cohesive text (Schoonen et al., 2003).

Additionally, researchers suggest that learners practice writing as much as possible. Robertson (2010) specifically suggests that writing short cinquain poems can provide learners with writing practice that takes little time. Practicing with short texts provide learners with bursts of writing that can be completed in any setting, as opposed to requiring a few hours to contemplate.

## **Hypotheses**

I theorized that by combining some of the common metacognitive strategies into a time-series design, I could see trends in learning outcomes. Specifically, I aimed to

discover if university students enrolled in the initial courses for a modern language would have higher final course grades after being presented with metacognitive strategies.

Additionally, I hypothesized that these same students would be more likely to continue to the next TL course. Four hypotheses were examined in the current study to determine the effectiveness of the proposed interventions explained previously:

1. Participation in the study and exposure to the interventions, the type of intervention, and their potential interaction would positively predict final course grades.

2. Participation in the study and exposure to the interventions, the type of intervention, and their potential interaction would positively predict persistence to enroll in the next course.

3. Perceived usefulness of the interventions, the type of intervention, and their potential interaction would positively predict final course grades.

4. Perceived usefulness of the interventions, the type of intervention, and their potential interaction, would positively predict persistence to enroll in the next course.

Hypotheses 1 and 2 compared students that participated in the study (experimental group) to matched students that chose to opt out of the study (control group). The control group was randomly selected from the remaining population of students enrolled in the same courses, but selection bias (specifically participants who chose to participate) could be a significant confound. Hypotheses 2 and 4 included only students able to enroll in the next TL course because they met the prerequisites (i.e. it is mandatory that a student receive a letter grade of “C” or higher before enrolling in an advanced course), and thus, had the ability to decide if they wanted to continue or not.

## METHODS

### Participants

After receiving IRB approval (Missouri State University IRB Approval Code IRB-FY2017-58; Approval Date: September 27, 2016; Appendix A), participants were recruited through 18 language courses offered at Missouri State University based on nine modern languages (Arabic, Chinese, French, German, Italian, Japanese, Portuguese, Russian, and Spanish) and two course levels (introductory course “101” and second year basics course “201”). Participants studying Greek, Hebrew, and Latin courses were omitted; these languages are considered ancient languages, and thus the courses do not function similarly to, nor have similar goals as, the modern language courses.

Of the 547 unique students enrolled in one of the 18 language courses, 32 students initially volunteered to participate in the study. Because of the small sample size, the remaining 515 students were recruited again during the midpoint of the sessions (i.e., in a “second wave”). The “second wave” of students who volunteered increased my participant pool by 11. Thus, 43 total students participated in the study with a mean age of 20.35, ( $SD = 4.70$ ) in which 14% were male. Courses in which fewer than five students participated in the study were combined into an “Other” category for data analysis, such as Russian 101 and Chinese 201. The final sample size for each target language (TL) and course level is included in Table 1, while the demographics for sample by time of recruitment (i.e. “wave”) is included in Table 2. Participation was voluntary, and participants were entered into drawings for gift cards as compensation. Participants were identified based on student number (for demographic information such as final

grade, GPA, etc.) and on preferred email (for information assessed during sessions).

Although data did not remain anonymous, it remained confidential.

Participants were compared to their nonparticipating peers for Hypotheses 1 and 2 and were matched based on course level and TL. Thus, the breakdown of the participant sample in Table 1 is identical for the nonparticipant sample. The matched nonparticipant sample was not significantly different ( $\alpha < .01$ ) from the participant sample based on age ( $M = 22.02$ ,  $SD = 5.48$ , Welch's  $t(82.10) = 1.52$ ,  $p = .13$ ), nor GPA ( $M = 3.05$ ,  $SD = 0.60$ ,  $t(84) = 2.24$ ,  $p = .03$ ). However, the nonparticipant sample did contain significantly more males (40% male,  $\chi^2(1) = 8.46$ ,  $p < .001$ ). Analyses controlled for each of these variables, regardless of significant differences or lack thereof.

## **Materials**

**Remind 101.** Participants registered for the study using Remind 101, a tool that allows teachers to interact with their students. Usually, teachers create their class and invite students to join. Then, teachers can send reminders to students, such as exam dates or field trips. Those that sign up via Remind 101 receive messages sent by teachers as a text to the phone number they provide when registering.

Participants provided their phone number to Remind 101, which allowed their information to remain private; no investigators were able to access provided phone numbers. On the initial day of a session's deployment (Monday), all participants received a text message via Remind101 about the new session opening, along with a link to begin and complete the session. If a student did not participate by the midway point of the week (Thursday), he or she was individually reminded of the session via Remind 101.

On the final day of session deployment (Sunday), any student that had still not participated was encouraged to take part in the session and again provided with the original session link individually via Remind 101. After the second reminder (third message), no more reminders about that particular session were sent. See Appendix B for sample messages.

Remind 101 also allows teachers to decide if students should be able to reply to messages sent by teachers. Although replies could be beneficial for a true classroom, replies for the current study were blocked, as it would send the reply to *all* participants. By removing this feature, I was able to keep each participant's information confidential and keep mass communication to a minimum. Participants were given contact information outside of Remind 101 for questions or concerns.

**Demographics Questionnaire.** During the initial session, participants received a demographics questionnaire to allow for statistical control of demographic characteristics during analyses, such as previous experience with the TL, enrollment in multiple TLs, age, gender, and identifying the TL. After identifying the TL and course level, later items in the initial session “piped” course information. That is, later items referring to TL included each participant's own TL (e.g. “I try to use French frequently”) instead of a general placeholder (e.g. “I try to use [target language] frequently”).

The basic demographics questionnaire assessed only during the initial session is included in Appendix C. Some demographic-type questions were asked during the final session as well, such as “What grade do you predict to receive in this class?” These questions are *not* included in the demographics questionnaire located in Appendix C, but instead included with Session 5, when participants were asked these questions.

**Motivation Questionnaire.** Because the motivation to learn a language is distinct from the motivation to complete other academic tasks, a motivation questionnaire specifically designed for the context of language learning was employed. The selected motivation questionnaire was originally designed for Arabic students in their initial year of undergraduate programs learning English, but has been adapted to university students learning other TLs (Wimolmas, 2013). The scale itself was adapted from Gardner's Attitude and Motivation Test Battery (Gardner, 2004), and specifically included the context of language learning. Wimolmas (2013) assessed overall language learning motivation using the two factors discussed earlier by Gardner (2007): instrumental and integrative motivation. The scale contains 10 items for each factor along with one final open-ended question. Scores on each item range from 1-5 with "1" being low motivation and "5" being high motivation, and an overall mean score for general motivation being calculated at the conclusion. The motivation questionnaire is included in Appendix D.

Wimolmas (2013) defined "high motivation" as an average score above 3.67 and "low motivation" as an average score below 2.34. Participants scoring between 2.34 and 3.67 were considered to have a "moderate degree of motivation". The mean score on his scale was 4.16 ( $SD = 0.59$ ), indicating high motivation for his specific subset of learners: Arabic students at a technical school learning English.

**Strategy Inventory for Language Learners.** The Strategy Inventory for Language Learners (SILL, version 7.0) contains a total of 50 questions that assess what strategies were used to learn, and to what degree each strategy was used in the learning process, specifically when learning a foreign language (Oxford, 1990). The SILL is one of the most commonly used inventories for the measurement of language learning



strategy use. The SILL has repeatedly shown adequate to excellent levels of internal reliability, with Cronbach's alpha ranging from .67 to .96 for the English version, .94 for the Chinese and Japanese versions, and .93 for the Korean version (see: Hong-Nam & Leavell, 2006; Hsiao & Oxford, 2002; Robson & Midorikawa, 2001; Wharton, 2000; Nyikos & Oxford, 1993). However, the SILL has shown inconsistent results for construct validity and structure. Researchers conducting exploratory factor analyses have proposed anywhere from one to fifteen factors (Park, 2011; Robson & Midorikawa, 2001, respectively), depending on the context in which the SILL was deployed. While Oxford herself suggested that a two-factor or a six-factor model was most appropriate for the inventory (Oxford, 1986; Oxford, 1990), researchers continue to debate if such structure is suitable. Park (2011) proposed that the validity of the scale be considered within the context of the population being studied and the underlying linguistic principles, such as following Oxford's two-factor model when considering direct and indirect strategies, or following the three-factor model provided by O'Malley and Chamot (1990) when considering strategies as metacognitive, cognitive, or socio-affective strategies.

Because the inventory is so lengthy, participants were not asked to complete the SILL in its entirety during any one session. Instead, the relevant items on the SILL for each intervention were assessed in the following session (see Appendix E for an outline of the basic process for participants). That is, since Intervention 2 presents strategies for improving vocabulary, SILL items such as "I use new target language words in a sentence so I can remember them" were asked during the next session (Session 3). Asking during the next session provided participants with actual time to, hopefully, practice using the strategies presented before being asked if they did or did not use said

strategies. The specific items from the SILL assessed during each session (as they relate to the *previous* intervention) are found at the conclusion of each session in Appendices G-J. No questions from the SILL were measured for Session 1, as participants were not exposed to new metacognitive strategies prior to the initial session that could be assessed.

## **Interventions**

The study contained five sessions for participation, but only exposure to four *interventions* (exposure to explicit modules for improving metacognition). Session 1 (Appendix F) contained initial demographic information and the first intervention (basic metacognition). Session 2 (Appendix G) contained the second intervention (improving vocabulary), while Session 3 (Appendix H) contained the third intervention (successful listening), and Session 4 (Appendix I) contained the fourth intervention (improving writing). Session 5 (Appendix J) did not contain any intervention, but concluded the study with final demographics and motivation questionnaires along with questions about the effectiveness of the previous intervention—improving writing (see Appendix E for an outline of the basic process for participants). Each intervention exposed participants to a text transcription of explicit metacognitive strategies and an online video with the text presented while being read aloud. Both mediums allowed participants to read at his or her own pace, take notes, or read/listen again. The presentation of new strategies for each intervention took approximately 10 minutes to read or to listen.

Once receiving the session link via Remind 101, participants were directed to the first intervention encompassing an introduction to metacognition. Intervention 1 did not include any explicit tips on how to improve metacognition, but rather asserted the basics

of general metacognition and what to expect throughout the study, as many students are unaware of what metacognition is (Karpicke, 2009). The transcript for Intervention 1 can be found at the beginning of Appendix F, as it was employed during Session 1.

The second intervention exposed participants to tips on improving vocabulary via the keyword method and semantic context method described earlier. I hypothesized that less attrition would exist if a well-established method were presented first, hence the presentation of the keyword method. Further, learning new vocabulary is consistently a goal for any language course, and thus students in either course level could use the tips provided during this intervention, especially early in the semester. The transcript for Intervention 2 can be found at the beginning of Appendix G.

During the third intervention, participants were exposed to tips to improve listening and information about linguistic motivation. Listening is usually viewed as the most daunting task for language comprehension, as evidenced by my participants (46% answered “Listening” as the hardest part of learning a language) and previous studies have found similar trends (Wimolmas, 2013; Vandergrift, 2004). Thus, exposing participants to tips for improving listening was considered beneficial for participants in the current study. Information about linguistic motivation was also provided during this specific session, since the enrollment period for the next semester became available roughly during the time of deployment. It was key for participants to understand how they could feel motivated to learn and be able to consider how that might affect their future enrollment decisions *before* having to make said decisions. Thus, the sub-intervention of motivation was added to the listening intervention. Collectively, the listening and motivation sub-interventions are Intervention 3 (See Appendix H).

The final intervention encompassed another difficult linguistic task: production of written language. Although speaking is also found to be formidable, students in the introductory course (101) may not reach a point where speaking novel utterances in the TL becomes a requirement. Because the relevance of speaking tips could not be guaranteed for a majority of participants, writing tips were deemed most potentially beneficial for all. Intervention 4 can be found in Appendix I.

At the conclusion of each intervention, participants answered two or three multiple choice questions about the new intervention material. These questions served as a manipulation check to ensure that the participants comprehended the intervention material. The manipulation checks are located in Appendices F- I immediately following the relevant intervention. Information on participant accuracy for each manipulation check is included in Table 3.

Once completing interventions and manipulation checks, participants were asked about their attitudes regarding the information presented. Participants first answered questions pertaining to the current intervention, such as “Do you feel the intervention presented today will be beneficial?” Next, participants answered questions pertaining to their use of the previous intervention, such as “Did you use the tips provided during the *previous* session?” Assessing questions that relate to practicing tips during the following session allowed participants approximately one week to consider applying the tips exposed in each intervention. Both attitude surveys can be found during the session in which they were deployed (Appendices F-J), such that items assessing the intervention about vocabulary as the current intervention (“Do you feel the intervention today will be beneficial?”) are in Appendix G (Session 2), but items assessing practicing vocabulary

tips (“Did you use the tips provided during the *previous* session?”) are in Appendix H (Session 3).

### **Design and Procedure**

A repeated measures time series design was employed for analysis and included four measurement points, one for each intervention described earlier. For data analysis, all information pertaining to an intervention was included as one time point, despite some information being collected later in the study. That is, even though items assessing if participants used the vocabulary strategies (Session 3) were employed later than all other questions assessing vocabulary strategies (Session 2), all information collected about vocabulary strategies was considered one measurement point: Intervention 2 information (see Appendix E for an outline of the basic process for participants).

First, an e-mail was sent to approximately 550 students enrolled in a modern language 101 or 201 course with a link to register their phone number using Remind 101 and a note that participation was voluntary. Next, students who registered for the study received a text with the link to begin the study. The link directed participants to the first online session comprised of the consent form, basic demographics questionnaire (Appendix C), the motivation questionnaire (Appendix D), and the first intervention, manipulation check, and attitudes toward the first intervention (Appendix F). The session remained open for one week (Monday through Sunday). Participants who did not complete the session before the midway point of session deployment received a second text via Remind 101. Participants who did not complete the session before the final day of session deployment received a final reminder text. After each session was open for

one week, participants were asked to use the following week to practice the strategies presented during the session. During this time, no new sessions were made available. Thus, sessions occurred on alternating weeks and participants could choose when in the week they wanted to participate.

After the week to practice, a new text was sent to all participants urging to participate in Session 2 along with a new link. The new link redirected to the new session, which included a new consent form, the second intervention and manipulation check for said intervention, the survey for attitudes about the current intervention, the survey for attitudes about the previous intervention (Intervention 1), and the relevant items from the Strategy Inventory for Language Learners (SILL) as they relate to the previous intervention (Intervention 1) (See Appendix G).

Midway through the study, a second recruitment e-mail was sent to encourage students who had not yet registered to participate in the study. Students who volunteered to participate during the second recruitment phase (the “second wave”) were assigned to Session 1 while the original participants were assigned to Session 3. Afterwards, both groups of participants were assigned to Session 4 and later Session 5. This “second wave” of participants aimed to aid the retention rate and small sample size (see Table 2).

This procedure continued until all five sessions had been announced. At the final session, participants were given the survey for attitudes about the final intervention (Intervention 4) and relevant questions from the SILL as it relates to said intervention, a final survey about the study as a whole (Appendix J), and a final motivation questionnaire (Appendix D). After the semester was completed, documented data for final course grade, GPA, and continued enrollment in the TL was collected.

## RESULTS

### **Multilevel Models**

The data were intended to be analyzed using parametric and logistic multilevel models that allowed for control based on course level and target language (TL). However, many course level/TL conditions included only one participant, which made calculating variance impossible. Thus, the multilevel models failed to converge. Instead, hierarchical multiple linear regressions and hierarchical logistic regressions substituted the proposed method of data analysis. Ultimately, these regressions answered the overall research questions and controlled for the pressing demographic variables such as GPA, gender, age, TL, and course level, but the interaction between type of intervention (control, vocabulary, listening, and writing) and participation in each intervention individually (yes or no) was not analyzed due to small sample sizes.

Some participants showed significant previous experience with the TL (defined as more than 2 years of structured instruction for those in the introductory course,  $N = 5$ ; and defined as more than 4 years of structured instruction for those in the advanced course,  $N = 3$ ). Due to the small sample size ( $N = 86$  [Hypotheses 1 and 2] and  $N = 43$  [Hypotheses 3 and 4] before data screening), data collected from these participants was included in analyses.

### **Prediction of Course Grade for Participants Versus Matched Nonparticipants**

First, I predicted that participation in, and exposure to, the metacognition interventions would positively predict final course grade. The data were screened for

missing data, outliers, and assumptions for regression. Although two participants were considered outliers (i.e., their data met the cutoff for at least two of the following: Cook's values, Leverage values, and/or Mahalanobis distances), their data were retained in the analyses since a participant cannot truly be an outlier for educational outcomes (i.e. their final course grades are accurate). Additionally, the inclusion of outliers had insignificant effect on the final inferential statistics. Normality, linearity, homogeneity, homoscedasticity, and additivity were all met.

I predicted that several variables may predict final grade, thus, a hierarchical model was analyzed to test the ability of participation to uniquely predict final grade. First, differences in courses were considered. The first model controlling for TL (using Spanish as the dummy-coded reference group) and course level (using Introductory, or "101", for reference) was not significant,  $F(3, 81) = 0.26, p = .86, R^2 = 0.01$ . Thus, TL and course level could not predict final grade.

Next, differences in student demographics of age and gender (using males as the reference group) were analyzed. The addition of these variables was marginally insignificant,  $F(2, 79) = 2.88, p = .06, \Delta R^2 = 0.04$ , Overall  $R^2 = 0.05$ , indicating that TL, course level, age, and gender together did not significantly predict final grade.

Then, differences in student GPA were considered. Empirical evidence supports that current and previous GPAs are a significant predictor of future grades (Hodara & Lewis, 2017; Hodara & Cox, 2016), thus, it was no surprise that the addition in this model was significant,  $F(1, 78) = 42.54, p < .001, \Delta R^2 = 0.30$ , Overall  $R^2 = 0.35$ . When participants had a higher GPA, they were more likely to obtain a higher final course grade in their TL,  $b = 1.06, t(78) = 5.96, p < .001, pr^2 = .43$ .



Finally, the addition of participation as a predictor for final course grade was significant,  $F(1, 77) = 16.48, p < .001, \Delta R^2 = 0.06, \text{Overall } R^2 = 0.41$ . When participants decided to participate in the study and were exposed to metacognitive strategy instruction, they were more likely to achieve a higher final grade,  $b = 0.90, t(77) = 4.06, p < .001, pr^2 = .20$ . The moderate effect size for  $pr^2$  alludes that exposure to metacognitive strategies can predict final grades. See Table 4 for all predictor information and Figure 1 for the graphical representation of the data.

### **Prediction of Persistence for Participants Versus Matched Nonparticipants**

Next, I predicted that participation in the metacognition interventions would positively predict persistence (enrollment in the next course). Students enrolled in TL 101 who then enrolled in TL 102, and students in TL 201 who enrolled in TL 202 were considered to “persist” in their target language learning. Likewise, students enrolled in TL 101 who immediately enrolled in TL 201 were considered to “persist” ( $N = 3$ ). Students who were retaking the current course, taking a course in any other language, or failing to take any language courses were considered to “not persist”.

A hierarchical binary logistic regression analysis was conducted to evaluate the prediction of persistence using participation after controlling for course and individual differences. The data were screened for missing data, outliers, and assumptions for regression. Due to prerequisite limitations, all students receiving a grade below “C” (2.0) were omitted for this analysis ( $N = 14$ ;  $N = 1$  participant,  $N = 13$  nonparticipants). Of the students able to decide to continue enrollment, 44 persisted and 27 did not.

The first regression step which included TL and course level differences was not significant,  $\chi^2(3) = 4.24, p = .24$ , Nagelkerke's Pseudo  $R^2 = 0.08$ , thus indicating that course alone could not predict persistence in enrollment. Next, individual demographic variables (age and gender) were included in the analysis. Once more, the addition in this model was not significant,  $\chi^2(5) = 10.07, p = .07$ , Nagelkerke's Pseudo  $R^2 = 0.18$ , indicating that course and demographics were unable to predict persistence. Then, GPA was included in the analysis. Surprisingly, this model was also not significant,  $\chi^2(6) = 10.31, p = .11$ , Nagelkerke's Pseudo  $R^2 = 0.18$ . Thus, despite previous research indicating that GPA is a significant predictor in retention (Reason, 2003), GPA was unable to provide predictive power in the current study after controlling for previous variables. This lack of significance provides further evidence that the current study is lacking sufficient power.

Finally, participation in the interventions was added to the analysis. This final model also produced nonsignificant results,  $\chi^2(7) = 10.90, p = .14$ , Nagelkerke's Pseudo  $R^2 = 0.19$ . Thus, when controlling for course level, TL, age, gender, GPA, and motivation, participation in and exposure to metacognitive strategies were unable to account for significant unique variance.

Overall, 72.24% of participants were correctly predicted in their persistence, with better predictions for those persisting (88.64%) compared to those ending their TL university education (48.15%). Students enrolled in French and advanced courses were more likely to persist. Males and younger students were more also likely to persist. Students with higher GPAs and those who participated in the interventions were more likely to persist as well (see Table 5 and Figure 2).

## Prediction of Course Grade for Participants

Next, I predicted that, of those who were exposed to the metacognitive strategies, perceived usefulness of the interventions would positively predict final course grade.

Because most participants did not participate in all sessions, a mean “perceived usefulness” score was calculated for each participant. The data were screened for missing data, outliers, and assumptions for regression. Participants who did not indicate their perception of usefulness at least once were omitted from further analysis ( $N = 14$ ). Using previously stated standards, no participants were considered outliers.

Following a similar procedure to previous hypotheses, differences in courses were controlled for initially. The first model controlling for TL (using Spanish as the dummy-coded reference group) and course level (using Introductory, or “101”, for reference) was not significant,  $F(3, 24) = 0.36, p = .78, R^2 = 0.04$ . Thus, the course alone was unable to predict final course grade for participants. Next, individual age and gender (using males as the reference group) were analyzed. Once more, the addition in this model was not significant,  $F(2, 22) = 0.89, p = .43, \Delta R^2 = 0.04$ , Overall  $R^2 = 0.08$ , indicating that course, age, and gender together cannot significantly predict final TL course grade. Then, student GPA was considered. This model was significant,  $F(1, 21) = 23.02, p < .001, \Delta R^2 = 0.47$ , Overall  $R^2 = 0.55$ . When participants had a higher GPA, they were more likely to achieve a higher grade in the TL course,  $b = 0.81, t(21) = 4.68, p < .001, pr^2 = .92$ . When adding GPA into the regression, a large portion of variance was accounted for ( $\Delta R^2 = 0.47; pr^2 = .92$ ), which left little variance to explain by remaining variables (motivation and mean perceived usefulness).

Next, differences in individual motivation scores were analyzed. While research has shown that having *any* type of motivation is important for learning a new language (Gardner, 2007), this model was not significant,  $F(1, 20) = 2.82, p = .11, \Delta R^2 = 0.06$ , Overall  $R^2 = 0.61$ , indicating that motivation itself could not uniquely predict final course grade after controlling for GPA and other variables. Finally, the overall regression model including mean perceived usefulness as a predictor for final course grade was not significant,  $F(1, 19) = 0.30, p = .59, \Delta R^2 < 0.01$ , Overall  $R^2 = 0.61$ . See Table 6 for all predictor information and Figure 3 for the graphical representation of the data.

### **Prediction of Persistence for Participants**

Next, I predicted that, of those that participated in and were exposed to the metacognition interventions, the mean perceived usefulness of such interventions would positively predict persistence as defined earlier. A hierarchical binary logistic regression analysis was conducted to evaluate the prediction of persistence using mean perceived usefulness of metacognition interventions, controlling for course and individual differences.

The data were screened for missing data, outliers, and assumptions for regression. Similar to Hypothesis 2, participants who did not meet prerequisites were omitted from analysis. Of those participating in the interventions and able to decide to continue enrollment, 20 continued advanced enrollment in their TL and 8 did not. No issues with multicollinearity were present. Parallel to previous hypotheses, the first model included TL and course level differences. This model was not significant,  $\chi^2(3) = 0.75, p = .86$ , Nagelkerke's Pseudo  $R^2 = 0.04$ , thus indicating that course alone could not predict

persistence in enrollment. Next, individual demographic variables (age and gender) were included in the analysis. Again, this model was not significant,  $\chi^2(5) = 1.72, p = .89$ , Nagelkerke's Pseudo  $R^2 = 0.09$ , indicating that course and demographics were also unable predict persistence. Then, GPA was analyzed. This model was also not significant,  $\chi^2(6) = 2.96, p = .81$ , Nagelkerke's Pseudo  $R^2 = 0.14$ . Next, individual differences in motivation were included in the analysis. Again, this model was nonsignificant,  $\chi^2(7) = 3.13, p = .87$ , Nagelkerke's Pseudo  $R^2 = 0.15$ . Finally, mean perceived usefulness was added to the analysis. This final model also produced nonsignificant results,  $\chi^2(8) = 5.25, p = .73$ , Nagelkerke's Pseudo  $R^2 = 0.24$ . Thus, when controlling for course level, TL, age, gender, GPA, and motivation, perceived usefulness was unable to account for significant unique variance.

Overall, 75.00% of participants were correctly predicted in their persistence, with better predictions for those persisting (90.00%) compared to those ending their TL university education (37.5%). Students enrolled in Spanish and introductory courses were more likely to persist. Females, students with higher GPAs, and students with higher motivation scores were also more likely to persist. However, students rating the interventions as more useful were less likely to persist (see Table 7 and Figure 4).

### **Prediction of Strategy Use for Participants**

Finally, an exploratory analysis evaluating the relationship between the mean perceived usefulness of metacognitive interventions and scores on the Strategy Inventory for Language Learning (SILL) was considered. The data were screened for missing data, outliers, and assumptions for regression. Participants that did not indicate their

perceived usefulness at least once were omitted from further analysis ( $N = 14$ ). Using previously stated standards, no participants were considered outliers.

Analogous to previous hypotheses, differences in courses were controlled for first. The first model controlling for TL (using Spanish as the dummy-coded reference group) and course level (using Introductory, or “101”, for reference) was not significant,  $F(3, 15) = 0.22, p = .88, R^2 = 0.04$ . Thus, the course alone was unable to predict mean score on relevant SILL items. Individual age and gender (using males as the reference group) were controlled for next. Again, this model was not significant,  $F(2, 13) = 0.89, p = .44, \Delta R^2 = 0.07, \text{Overall } R^2 = 0.11$ , indicating that course, age, and gender together could not predict mean SILL score.

Then, differences in student GPA were considered and was also nonsignificant,  $F(1, 12) = 0.28, p = .61, \Delta R^2 = 0.01, \text{Overall } R^2 = 0.12$ . Next, differences in individual motivation scores were analyzed. Again, motivation scores were not significant,  $F(1, 11) = 0.85, p = .38, \Delta R^2 = 0.03, \text{Overall } R^2 = 0.15$ , indicating that motivation itself could not uniquely predict mean SILL score when controlling for GPA and other variables. Finally, the inclusion of mean perceived usefulness as a predictor for mean SILL score was significant,  $F(1, 10) = 12.48, p < .001, \Delta R^2 = 0.47, \text{Overall } R^2 = 0.62$ . When participants found the interventions to be useful, they were more likely to also have a high mean score on the relevant SILL items ( $b = 0.67, t(10) = 3.53, p < .001, pr^2 = .55$ ). The large effect sizes ( $\Delta R^2 = 0.47; pr^2 = .55$ ) provide evidence that perceived usefulness of the interventions was a strong predictor of SILL scores, as 55% of the variance not accounted for by TL, course level, age, gender, GPA, and motivation was accounted for by perceived usefulness (see Table 8 and Figure 5).

## DISCUSSION

The current study aimed to shed light on how metacognitive strategies can be used in a diverse set of structured language classes at the university setting. Specifically, I sought information about which metacognitive strategies could be taught and which, if any, would be most beneficial for such a diverse sample. While the sample size was too small to conduct multilevel models that would assess interaction effects between strategy type and course level/target language (TL), and which led to insufficient power, overall I was able to find trends that metacognitive strategies could be beneficial for university students. Future research should address the shortcomings of this pilot study.

### **Predicting Using Participants Versus Matched Nonparticipants**

**Prediction of Course Grade.** My first hypothesis, predicting final grade based on participation in metacognitive interventions, proved to be statistically significant with a moderate effect size for the unique variance accounted for by participation in the interventions alone ( $\Delta R^2 = .06$ ). Thus, it appears that learning metacognitive strategies could be beneficial when taught with the “standard” language learning material. When students are exposed to information about *how* to learn effectively, their success in learning outcomes increases (Pishghadam & Khajavy, 2013; Vrugt & Oort, 2008; Wolters, 2004; Kramarski & Mevarech, 2008, Dignath et al., 2008).

The most daunting limitation for specifically analyzing final grade as the sole learning outcome is grade inflation. Educators and researchers continually express their concern that university grades are not a reflection of actual learning (Owen, 2009).

Rojstaczer and Healy (2012) discovered that the proportion of “A” grades given increased from 15% of all letter grades in 1960 to 43% of all letter grades in 2009. A similar distribution of grades was found across the 469 students enrolled in the courses analyzed in the current study who received a letter grade for their coursework (i.e., did not withdraw or receive an incomplete grade); 47.5% received a final grade of “A” or “A-”. Grade inflation may be especially true for language learning courses, where student retention is already a common concern (Rojstaczer & Healy, 2012; Owen, 2009). Future research should consider diverse learning outcomes, such as final course grade, standardized test scores, perceived accuracy, and perceived fluency—especially considering multiple outcomes simultaneously.

A second limitation for the first and second hypotheses was selection biases. Originally, participants were to be compared to themselves in a multilevel model, such that the first intervention (basic metacognition) would serve as the “control” condition. The lack of power in the study caused by a negligent sample size created formidable statistical limitations. When deciding to analyze the data using regression and comparing to a randomly-selected nonparticipant control group, demand characteristics became a potentially confounding variable. Some of the effects found in the current study may be due said characteristics. It is imperative that future research obtain a sample size large enough to have necessary statistical power and the ability to perform the original proposed multilevel models. Additionally, conducting studies using research designs which counterbalance or eliminate demand characteristics (such as longitudinal designs performed within the classroom as opposed to voluntary extra-curricular interventions) could improve the reliability and validity of the study.



Moreover, the current pilot study cannot guarantee that students exposed to interventions truthfully understood material presented during this time. Two to three manipulation check questions were presented for each intervention and time spent on the page was recorded for each participant, but correctly answering a short amount of multiple-choice questions does not provide sufficient evidence to claim true comprehension (see Table 3). Thus, some participants may have participated in the intervention, but not retained the information presented during the intervention. Future research should consider other ways to ensure comprehension, such as longer manipulation checks or time set aside specifically to practice metacognitive strategies.

**Prediction of Persistence.** My second hypothesis, predicting persistence based on voluntary participation in metacognitive interventions, was not significant. Insufficient power due to small sample size may have influenced these results, as the effect size was moderate (Nagelkerke's Pseudo  $R^2 = 0.19$ ). It was estimated that a sample of 153 would be best for the hierarchical binary log regression (Faul, Erdfelder, Lang, & Buchner, 2007); however, the achieved sample size was approximately half at  $N = 86$ . Despite lack of significance and power, more students who volunteered to participate in the metacognitive interventions continued their language learning endeavors compared to their matched nonparticipant peers.

Additionally, GPA was also unable to predict persistence. The cause for continued student enrollment is multi-faceted, and varies from individuals in different situations. While any course may be enjoyable and inspire a student to continue to enroll in similar courses, many students do not have the time or funds, such as one participant

who expressed their reason for quitting their TL as, “It just won’t fit in my schedule”. Reasons for lack of persistence can vary outside the realm of lack of success.

Statistically, another limitation of this analysis is the difference in persistence group sizes. The number of students who did persist ( $N = 44$ ) was almost double the number of students who did not persist ( $N = 26$ ). While persistence is desirable, statistically, predicting correct group membership was much more likely for the larger group (persistence; 88.64% correct predictions) than the smaller group (non-persistence; 48.15% correct predictions). The reasons for non-persistence vary between individuals and contexts, and the raw number of those not persisting was small, which created statistical barriers for making correct predictions. Future research should consider the necessary sample size to achieve not only sufficient power, but also large enough persistence group sizes to make accurate predictions for both groups. However, I theorize that the group of students choosing to not persist in language learning may continue to be smaller than the group of students persisting, which will further the statistical limit on predictions.

### **Predicting Using Solely Participants**

**Prediction of Course Grade.** My third hypothesis, predicting final grade based on perceived usefulness of the metacognition interventions was also not found to be significant. When looking solely at the students who chose to participate in more than one intervention, GPA was the only predictor of unique variance in final grade that reached significance ( $p < .05$ ,  $\Delta R^2 = 0.47$ ).

Perceived usefulness may not be as predictive due to a regression towards the mean for perceived usefulness itself; no participants gave a rating less than “3” on the scale of 1-7, and most participants rated interventions between “no opinion” (4) and “somewhat useful” (5) ( $M = 4.81$ ,  $SD = 0.98$ ). Further, a minimum of 82 participants was suggested for this analysis (Faul et al., 2007), but only 28 participants provided enough data about their perceptions for analysis. Moreover, participants in the introductory classes were less likely to find the listening intervention useful because some introductory courses had not begun to cover listening skills, despite listening skills being mentioned in all course descriptions. This hypothesis was also limited by the efficacy of final grade as a learning outcome, as stated in the discussion for Hypothesis 1.

Future research should consider differences in course levels and TLs—specifically the interaction of these with different metacognitive strategies. Increased sample size and the use of multilevel models may be able to provide empirical evidence for the need to tailor metacognitive strategies to diverse levels and TLs. The current study found many TL 101 participants noting that, while the material in the intervention was probably useful, they had not reached a level of proficiency that would allow them to use the strategies effectively. Thus, future research may indicate that providing metacognitive strategies throughout the course when appropriate, instead of providing a one-size-fits-all lesson for every TL at every course level, is most beneficial for all.

It is worth noting that the prediction of final grade based on gender appeared to “switch” between the first and third hypotheses; the initial hypothesis indicated that being male increased final grade ( $b = -0.23$ ) while the Hypothesis 3 indicated that being female increased final grade ( $b = 0.30$ ). The change in regression signs is most likely due to a

change in sample; the first hypothesis examined participants and nonparticipants while the third hypothesis examined only participants. Moreover, the matched nonparticipant sample contained significantly more males ( $p < .01$ ) than the participant sample, thus influencing the regression weights. Future research should make effort to include more males in the study so that using gender as a predictor can be more accurate.

**Prediction of Persistence.** My next hypothesis, predicting persistence in the TL based on perceived usefulness, was also not found to be significant. When controlling for course, TL, age, gender, and motivation, there was little variance left to uniquely explain by perceived usefulness. This limitation was evidenced in the final model's large effect size: Nagelkerke's Pseudo  $R^2 = 0.24$ .

The analysis for this hypothesis was similarly limited by the small sample size (recommended  $N = 160$ , but achieved sample was  $N = 28$ ; Faul et al., 2007), and scores regressing toward the mean (as stated in the discussion for Hypothesis 3). Likewise, the  $b$ -value for perceived usefulness was negative (-0.90) and the  $z$ -value was moderately large (-1.37). These inferential statistics are also most likely due to little variance being left to explain after controlling for the numerous other variables.

**Prediction of Strategy Use.** For exploratory purposes, I lastly tested if the mean perceived usefulness of the interventions would be able to predict scores on the Strategy Inventory for Language Learning (SILL). In this hierarchical multiple linear regression, the perceived usefulness positively predicted the mean score on the relevant SILL items. That is, when participants found the metacognition interventions useful, they were more likely to rate relevant SILL items higher.

This model may support validity for the SILL, as it appears that using the metacognitive strategies may make it more likely to use strategies overall. However, this model has similar limitations as expressed previously (e.g., attrition rate, small sample sizes, etc.). Future research should continue to assess the SILL for validity by asking questions about the ability for measures to predict the SILL, such as diverse learning outcomes or perceptions.

## **Conclusion**

Generally, providing students with the tools to understand how they learn most effectively can provide benefit for learning outcomes in most domains of learning (Cross & Paris, 1988; Haller et al., 1988; Dignath et al., 2008; Raoofi et al., 2014; Kramarski and Mevarech, 2003; Wolters, 2004). While sample sizes in the current study were dramatically smaller than recommended (Faul et al., 2007), many analyses still found moderate effect sizes. Thus, a trend towards efficacy in exposure to metacognitive interventions is evident and should be explored.

Further, while Remind 101 can provide quick information to an audience (such as reminders about exams or permission slips), it may not be the best tool for recruitment in other contexts (such as voluntary participation in time series research). Even when receiving three texts per week, participants were likely to ignore the messages. Future research should consider other methods of communication and/or stronger incentives.

Similarly, the attrition rate between time points may have been reduced if the interventions were woven into the current course material. That is, if educators could incorporate metacognitive skills within the language learning classroom, students would

be more likely to be exposed to, and effectively learn, the information compared to strictly voluntary exposure. Future research should consider applying the current methods as an integral part of the language classroom. Likewise, providing “check your learning” time points wherein participants can actively see the strategies at work and prove that attempts are made to use said strategies could provide more efficacy for the research study.

While statistical analyses were unable to detect many statistically significant values in the current study, considerably insufficient power accompanied with moderate effect sizes allude that students may have much to gain by practicing metacognitive strategies in tandem with language skills. These strategies could improve language learning and allow classroom instruction to be most effective for all students, despite differences such as general aptitude, linguistic emotions, and learning preferences.

While future research focuses on tackling the immense shortcomings of this pilot study—namely sample size and demand characteristics, statistical procedures, and integrating the research design within the classrooms—educators should work to provide tools which educate students on metacognitive awareness and capitalize on the benefits of metacognition within the classroom. Providing metacognitive instruction has been found to greatly improve learning outcomes in many academic areas (Cross & Paris, 1988; Haller et al., 1988; Raoofi et al., 2014; Kramarski and Mevarech, 2003; Wolters, 2004; Dignath et al., 2008), and improved learning outcomes have been found to increase rates of persistence (i.e. enrollment; Murtaugh et al., 1999; Black, 2008). If educators can integrate metacognitive strategies in their classroom, students may be able to perform better, retain more language information, and continue enrolling in the TL.

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Table 1. Sample sizes based on target language and course level.

	Introductory Course	Advanced Course
Spanish	11	6
French	6	5
German	3	2
Arabic	1	0
Chinese	0	4
Italian	3	0
Portuguese	1	0
Russian	0	1

*Note.* This table represents the number of students that participated in the study. Data are divided by course level and shown by target language ( $N = 43$ ). Randomly selected nonparticipants were matched based on the above table ( $N = 43$ ), thus the current study includes double the values shown ( $N = 86$ ; 43 participants and 43 matched nonparticipants).

Table 2. Raw participation rates by session and time of recruitment.

Time of Recruitment	Session 1	Session 2	Session 3	Session 4	Session 5
Initial (“Wave” 1)	32	16	13	9	10
Delayed (“Wave” 2)	11	--	--	5	3
Total Participants	43	16	13	14	13

*Note.* Participants recruited midway through the study (during the second “wave”) participated in the first session while participants recruited for the study initially (during the first “wave”) participated in the third session. After the one-week break, all participants were directed to the fourth session regardless of time of recruitment.

Table 3. Success rates for intervention manipulation checks.

	Intervention 1 <sup>1</sup>	Intervention 2	Intervention 3	Intervention 4 <sup>2</sup>
<i>M</i> % Correct	75.58	70.83	71.79	67.86
<i>SD</i> % Correct	29.62	31.91	22.96	37.25
<i>N</i> scoring 0	2	0	0	2
<i>N</i> scoring 1	17	6	2	5
<i>N</i> scoring 2	24	2	7	7
<i>N</i> scoring 3	--	8	4	--

<sup>1</sup>Intervention 1 assessed scores for only two manipulation questions, while the remaining interventions assessed three questions.

<sup>2</sup>The second item for Intervention 4 was missed by more than 70% of participants and was omitted from manipulation check analysis.



Table 4. Model information for prediction of course grade given participation.

Model	Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>pr</i> <sup>2</sup>
1	Target Language					
1	Spanish vs French	0.08	0.34	0.22	.83	< .001
1	Spanish vs Other	0.12	0.32	0.37	.71	< .001
1	Course Level	0.20	0.28	0.74	.46	.01
2	Age	-0.05	0.03	-1.83	.07	.04
2	Gender	-0.23	0.34	-0.69	.49	.01
3	GPA	1.06	0.18	5.96	< .001	.43
4	Participation	0.90	0.22	4.06	< .001	.20

*Note.* Target language was represented as three dummy variables with Spanish serving as the reference group; course level with introductory serving as the reference group; gender with males serving as the reference group; and nonparticipation serving as the reference group.

Table 5. Model information for prediction of persistence given participation.

Model	Variable	<i>b</i>	<i>SE</i>	<i>z</i>	<i>p</i>
1	Target Language				
1	Spanish vs French	0.45	0.64	0.70	.48
1	Spanish vs Other	0.40	0.59	0.67	.50
1	Course Level	0.93	0.52	1.78	.08
2	Age	-0.12	0.07	-1.79	.07
2	Gender	0.43	0.62	0.70	.49
3	GPA	0.21	0.43	0.49	.62
4	Participation	0.45	0.58	0.77	.44

*Note.* Target language was represented as three dummy variables with Spanish serving as the reference group; course level with introductory serving as the reference group; gender with males serving as the reference group; nonparticipation serving as the reference group; and no enrollment (non-persistence) serving as the reference group.

Table 6. Model information for prediction of course grade given perceived usefulness.

Model	Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>pr</i> <sup>2</sup>
1	Target Language					
1	Spanish vs French	0.16	0.33	0.47	.64	.01
1	Spanish vs Other	0.24	0.36	0.67	.51	.02
1	Course Level	0.17	0.28	0.62	.54	.02
2	Age	-0.01	0.05	-0.19	.85	< .001
2	Gender	0.30	0.53	0.57	.58	.02
3	GPA	0.81	0.17	4.68	< .001	.92
4	Motivation	0.03	0.02	1.71	.10	.14
5	Mean Perceived Usefulness	0.07	0.14	0.54	.59	.01

*Note.* Target language was represented as three dummy variables with Spanish serving as the reference group; course level with introductory serving as the reference group; and gender with males serving as the reference group.

Table 7. Model information for prediction of persistence given perceived usefulness.

Model	Variable	<i>b</i>	<i>SE</i>	<i>z</i>	<i>p</i>
1	Target Language				
1	Spanish vs French	-0.07	1.07	-0.06	.95
1	Spanish vs Other	-0.22	1.11	-0.20	.85
1	Course Level	-0.67	0.28	-0.76	.45
2	Age	0.01	0.14	0.10	.92
2	Gender	1.23	1.56	0.79	.43
3	GPA	0.90	0.83	1.08	.28
4	Motivation	0.03	0.07	0.41	.68
5	Mean Perceived Usefulness	-0.90	0.66	-1.37	.17

*Note.* Target language was represented as three dummy variables with Spanish serving as the reference group; course level with introductory serving as the reference group; gender with males serving as the reference group; and no enrollment (non-persistence) serving as the reference group.

Table 8. Model information for prediction of strategy use given perceived usefulness.

Model	Variable	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>pr</i> <sup>2</sup>
1	Target Language					
1	Spanish vs French	0.12	0.36	0.34	.74	< .01
1	Spanish vs Other	< .01	0.39	0.02	.98	< .001
1	Course Level	-0.20	0.30	-0.67	.51	.03
2	Age	0.05	0.06	0.92	.38	.06
2	Gender	0.63	0.66	0.94	.36	.06
3	GPA	-0.10	0.27	-0.38	.71	.01
4	Motivation	-0.02	0.04	-0.65	.53	.04
5	Mean Perceived Usefulness	0.67	0.19	3.53	< .01	.55

*Note.* Target language was represented as three dummy variables with Spanish serving as the reference group; course level with introductory serving as the reference group; and gender with males serving as the reference group.

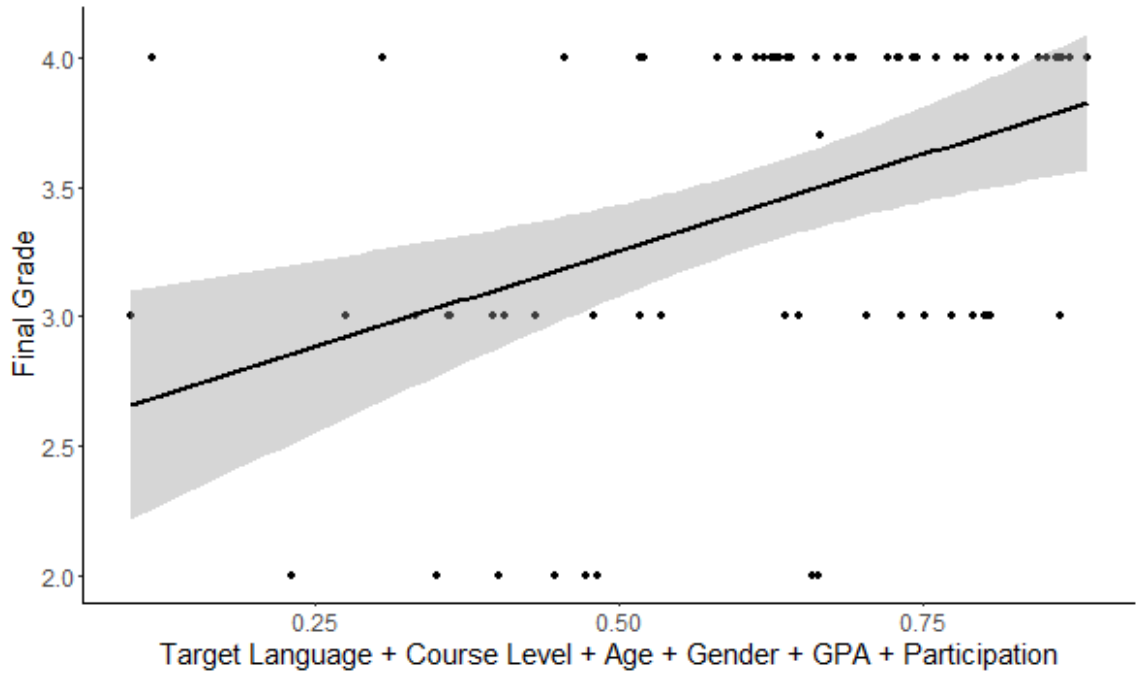


Figure 1. Scatterplot for prediction of final grade given participation via hierarchical linear regression (Hypothesis 1). The 95% confidence interval is indicated in the shaded area.

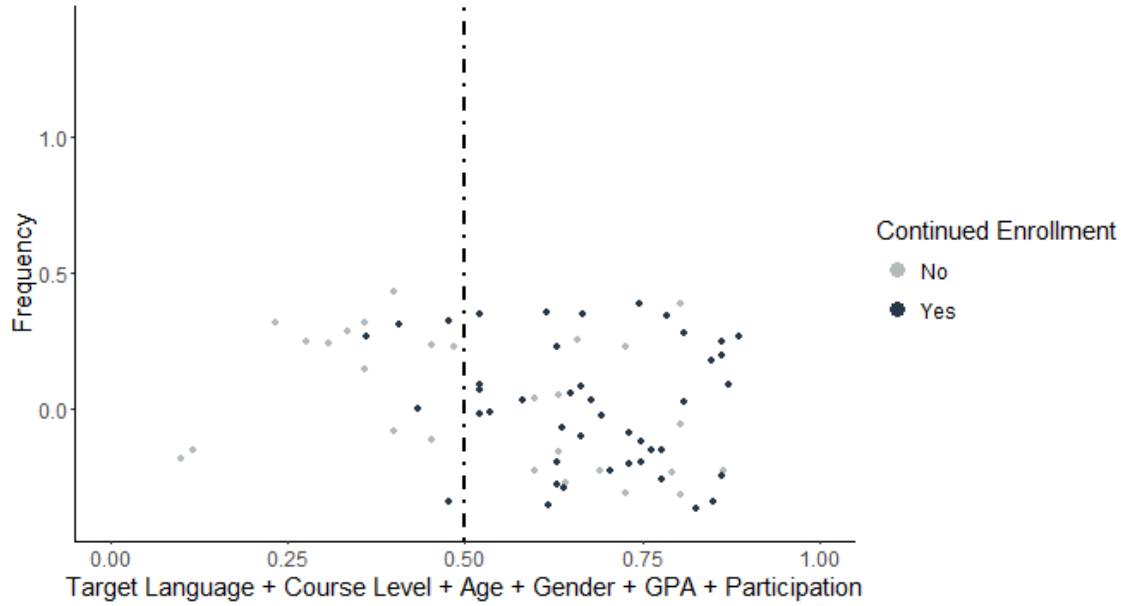


Figure 2. Dot plot for prediction of persistence given participation via binary logistic regression (Hypothesis 2). Points located on the right side of the graph are predicted to persist while points located on the left side are predicted to not persist. Dark points represent those who, in reality, did persist. Light points represent those who, in reality, did not persist.





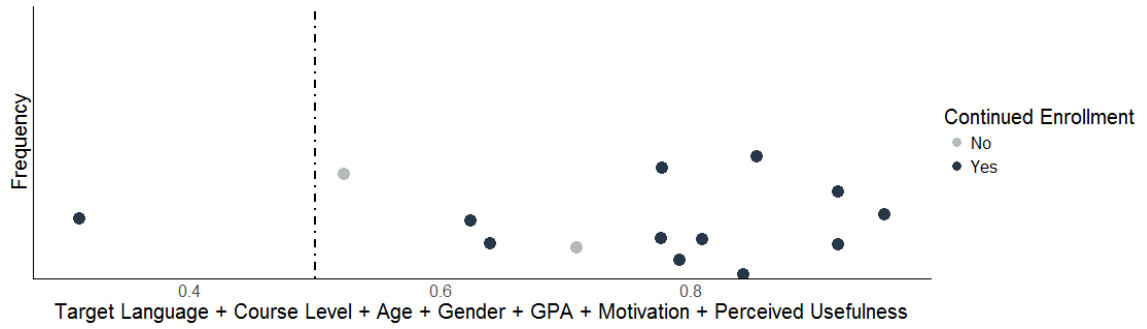


Figure 4. Dot plot for prediction of persistence given perceived usefulness via binary logistic regression (Hypothesis 4). Points located on the right side of the graph are predicted to persist while points located on the left side are predicted to not persist. Dark points represent those who, in reality, did persist. Light points represent those who, in reality, did not persist.

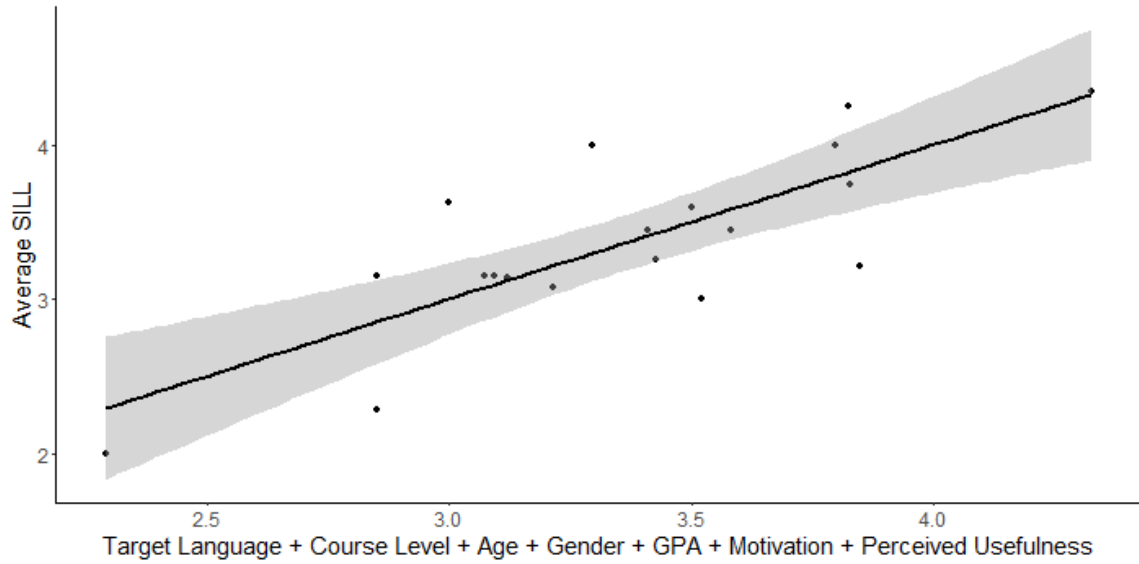


Figure 5. Scatterplot for prediction of strategy use given perceived usefulness via hierarchical linear regression (Hypothesis 5). The 95% confidence interval is indicated in the shaded area.

## APPENDICES

### Appendix A. Human Subjects IRB Approval



**Missouri State.**  
UNIVERSITY

**To:**  
Erin Buchanan  
Psychology

**RE:** Notice of IRB Approval  
**Submission Type:** Modification  
**Study #:** IRB-FY2017-58  
**Study Title:** Metacognition and Language Learning (Thesis for Rebecca Knoph)  
**Decision:** Approved

**Approval Date:** Sep 27, 2016  
**Expiration Date:**

This submission has been approved by the Missouri State University Institutional Review Board (IRB) for the period indicated.

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Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented. Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB.

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable.

**Researchers Associated with this Project:**  
**PI:** Erin Buchanan  
**Co-PI:**  
**Primary Contact:** Rebecca Knoph  
**Other Investigators:** Rebecca Knoph

## **Appendix B. Sample Messages sent via Remind 101**

Initial Message: Sent on Mondays for Initial Deployment

Welcome back! Here's Session 2:

To participate click below.

Each time you participate you increase your chance to win!

<http://bit.ly/2cPcAi6>

Second Message: Sent on Thursdays for Initial Reminder

Don't forget to join session 2!

To participate click the link.

Increase your chance to win and join today!

<http://bit.ly/2cPcAi6>

Third Message: Sent on Sundays as Final Reminder

We would love to have you in our language study for this session!

To participate click the link.

Increase your chance to win and join today!

<http://bit.ly/2cPcAi6>

## Appendix C. Basic Demographic Survey

### Basic Demographics Questionnaire

1. Informed consent
2. What language course are you CURRENTLY enrolled in? If you are enrolled in multiple, please choose one to focus on for this study.  
*Note: Zero participants enrolled in multiple languages.*
  - a. Arabic
  - b. Chinese
  - c. French
  - d. German
  - e. Italian
  - f. Japanese
  - g. Portuguese
  - h. Russian
  - i. Spanish
3. What course level are you CURRENTLY enrolled in?
  - a. 101
  - b. 201
4. Have you had any previous experience with your target language?
  - a. No
  - b. Yes, explain:
5. What is your first (native) language?
  - a. English
  - b. Other or multiple (bilingual), explain:
6. Have you studied/ do you speak aside from your native language and target language?
  - a. No
  - b. Yes, explain:
7. What is your MAIN reason for taking this course?
  - a. It's a degree requirement
  - b. I want to learn this language
  - c. Other, explain:
8. What is your gender?
  - a. Male
  - b. Female
  - c. Prefer to not answer
9. What is your current age?
10. How many years have you attended college (including this year)?
11. What is your current college GPA?

## Appendix D. Motivation Questionnaire

### Language Learning Motivation Survey

Indicate your agreement on a scale of 1-5.

1 = Strongly Disagree, 3 = Neutral, 5 = Strongly Agree.

#### ***Instrumental Motivation***

1. I will mainly focus on using [target language (TL)]<sup>1</sup> for class assignments and the exams.
2. I will quote the textbooks and will avoid communicating myself when speaking or writing in class.
3. I am interested in reading only [TL] **required textbooks** for my university study, but NOT other [TL] texts e.g. newspapers, magazines.
4. I am more interested in earning a university degree and a good job than learning [TL] language itself.
5. I am more interested in furthering my higher education than learning [TL] language itself.
6. Learning [TL] is important for travelling abroad.
7. Learning [TL] is important for making me a knowledgeable and skillful person.
8. Learning [TL] is important for making me an educated person.
9. Being proficient in [TL] can lead to more success and achievements in life.
10. Being proficient in [TL] will make other people respect me.

#### ***Integrative Motivation***

11. Studying [TL] will enable me to understand [target language] books, movies, pop music, etc.
12. Studying [TL] will enable me to better understand and appreciate the ways of life of native [TL] speakers.
13. Studying [TL] will enable me to keep in touch with foreign acquaintances.
14. Studying [TL] will enable me to discuss interesting topics in [TL] with the people from other national backgrounds.
15. Studying [TL] will enable me to transfer my knowledge to other people e.g. giving directions to tourists.
16. Studying [TL] will enable me to participate freely in academic, social, and professional activities among other cultural groups.
17. Studying [TL] will enable me to behave like native [TL] speakers: e.g. accent, using [TL] expressions.
18. Studying [TL] will enable me to appreciate [TL] arts and literature.
19. Studying [TL] will help me to be an open-minded and sociable person like [TL] speaking people.
20. I am determined to study [TL] as best as I can to achieve maximum proficiency.

#### ***Open-Ended Question***

21. What do you think will be most difficult in learning [TL]?  
Writing, speaking, reading, or listening

<sup>1</sup>TL information was piped from the demographics questionnaire (Appendix B). For instance, if a student selects that she is enrolled in French 101, Item 18 would read, “Studying French will enable me to appreciate French arts and literature”.

## Appendix E. Outline of Basic Process

1. Initial Recruitment
2. Session 1
  - a. Consent
  - b. Demographics Questionnaire
  - c. Motivation Questionnaire
  - d. Intervention 1: Basic Metacognition
  - e. Manipulation check
  - f. Intervention 1 Attitudes
3. Session 2
  - a. Consent
  - b. Intervention 2: Increasing Vocabulary
  - c. Manipulation check
  - d. Intervention 2 Attitudes
  - e. Intervention 1 Perceived Usefulness
  - f. SILL items relevant to Intervention 1
4. Second Recruitment: Participants given Time 1, then skip to Time 4.
5. Session 3
  - a. Consent
  - b. Intervention 3: Successful Listening and Motivation
  - c. Manipulation check
  - d. Intervention 3 Attitudes
  - e. Intervention 2 Perceived Usefulness
  - f. SILL items relevant to Intervention 2
6. Session 4
  - a. Consent
  - b. Intervention 4: Improving Writing
  - c. Manipulation check
  - d. Intervention 4 Attitudes
  - e. Intervention 3 Perceived Usefulness
  - f. SILL items relevant to Intervention 3
7. Session 5
  - a. Consent
  - b. Intervention 4 Perceived Usefulness
  - c. SILL items relevant to Intervention 4
  - d. Demographics
  - e. Motivation Questionnaire

## Appendix F. Session 1: Basic Metacognition

### Intervention 1: What is Metacognition?

[Click here to listen to an audio of this text](#) or you can read the information below.

Welcome to the language learning study, Session 1: What is metacognition? This study will teach you about metacognition. So, first and foremost, what is metacognition? Most teachers would give you the definition of “thinking about thinking”. More precisely, metacognition is “the monitoring and control of thought” (Martinez, 2006). In essence, if we can become aware of how we think, we can change how we think as well.

Metacognition can serve many purposes, but for this first lesson we will focus on how metacognition allows for us to think about how we are doing when trying to learn. For example, can you name all 50 states? Even if you can answer this question, we are not always as accurate as we want to be. You may have a firm belief that you CAN name all 50 states but when you sit down and do it, find out you actually can’t.

Thus, part of your challenge with metacognition will be to be as accurate and objective in your appraisal of your knowledge as you can be. When you begin an appraisal of your performance in your target language course, think about how well you are performing in the class as accurately as possible.

Think about the areas that you excel in (for instance, vocabulary) and what areas you tend to struggle in (for instance, sentence structure). If you take a moment to consider these honestly, you may be able to contemplate spending more time in the areas that you are truly lacking in. This method is also known as “self-probing” and “metacomprehension”, where you make an appraisal on your current learning and adjust accordingly (Martinez, 2006).

For the remainder of this study, I will begin to give you tips about how you think, how your brain works, and how you can improve your learning—specifically in your language course.

This concludes session 1. Please return to the survey online, and we’ll see you next time!

#### Manipulation Check

1. Which definition fits for metacognition?
  - a. **“thinking about thinking”**
  - b. “thinking about feelings”
  - c. “thinking about the world”
  - d. “thinking about other’s perspectives”



2. This intervention mentioned considering the areas you are doing well in and the areas you aren't doing well in, then adjusting your learning accordingly. What is that?
  - a. **Self-probing**
  - b. Metacognition
  - c. Self-learning

*Note: The correct answer to each manipulation check is listed first and bolded.*

Attitudes about Current Session

1. Today, you learned about meta-cognition in general. Do you feel you will use the strategies presented today in your language course?
  1. Definitely not
  2. Probably not
  3. Somewhat not
  4. Maybe / unsure
  5. Somewhat yes
  6. Probably yes
  7. Definitely yes
2. Why or why not?

## Appendix G. Session 2: Increasing Vocabulary

### Intervention 2: Increasing Vocabulary

[Click here to listen to an audio of this text](#) or you can read the information below.

This session will focus on how to use mnemonic devices to improve your vocabulary skills. These devices are strategies used to improve your ability to remember information (Psych Central, 2015). This can be a list of items (method of loci), the definition of a single item (pegword method), or remembering the name that goes with a face (name-face mnemonic). The word mnemonic stems from the Greek god Mnemosyne, god of memory. Perhaps you can remember that by using a mnemonic device: imagine a powerful god, Mnemosyne, striking you with the memory you need before a test through mnemonic devices.

In your language course, you may opt to try out keyword mnemonics to remember target language vocabulary words as you begin to study them. A keyword is a word you currently know (most likely English) that looks or sounds similar to the word you want to remember and can connect the target word to the English translation (Wang et al., 1992). For example, say you want to remember the Norwegian word *vegg*, which translates to wall. You may choose to use the word *egg* as your keyword and picture a white wall being hit with a case of eggs. Now, when you see *vegg*, you will think *egg*, then picture the mental image, and conclude with *wall*.

Let us consider a second example: try to remember the word *bord*, which is Norwegian for *table*. You may use the keyword *board*, which is not technically found in the target word is similar phonetically. Picture a wooden cutting board sitting on your kitchen table as you chop vegetables. Now, you can use your mental image to remember the translation for *bord*.

For a final example, try to remember the word *reise*, meaning to travel. Sometimes, there are no obvious English words that can be used in your keyword, so you may need to get creative. *Reise* reminds me of Reese's candy, so *Reese's* will be the keyword. Imagine travelling across the country in your car eating Reese's to stay awake at the wheel. *Reise* – *Reese's* – *travel*. Now, try creating your own keyword method for a target language word you have learned recently. Begin by finding a keyword you can remember based on the target word, and then find a way to create a mental picture using the keyword and the English translation.

Unfortunately, this keyword method is great for remembering the definition of words initially, but over time, you may begin to forget these links since there is so much to remember (Wang et al., 1992). Not to mention, if you are working towards fluency, you definitely do not want to be stuck translating between languages! It is also difficult to interact keywords with abstract meanings, such as honesty and hope.

Thus, I suggest that you use this method for its intended purpose: to get a grasp on new vocabulary words initially. Once you think you have the word down, try moving on to

the next mnemonic: semantic-context strategy. The semantic-context strategy requires you to study a new word within a context in which you would find the word. For instance, when you were learning the word milk, you probably never encountered milk in a sentence such as, “He was such a milk!” but instead in, “Would you like milk for breakfast?”

Once you have the gist of a word, begin to study it in a sentence and try your best to refrain from directly translating it back into English. For instance, you might study *vegg* by saying, “The picture is crooked on that *vegg*”. As you begin to grasp enough of your target language to form full sentences, you may study the entire sentence such as, “*Jeg liker å reise hjem av og til*” (I like to travel home once in a while). In both cases, you are still able to create a mental picture of the meaning of the word—just without the English translation piece.

The semantic-context method has been shown to be more effective in the long term, presumably because there is less to remember (no keywords to interact). This also resembles real-life context and allows you to make connections similar to how a native speaker does. Native speakers tend to create a picture in their mind when someone speaks.

Hopefully, using both methods will allow you to get the most out of mnemonic strategies. You will have the opportunity to learn more initially using the keyword method, but by transitioning to the semantic-context method when you are ready will lead to less forgetting in the long term.

This concludes session 2: Increasing Vocabulary. Please return to the survey online, and we’ll see you next time!

#### Manipulation Check

1. The keyword method is best used to remember target language words:
  - a. **Initially**
  - b. Over time
  - c. When you are fluent
  - d. Only for class
2. Remembering a new word in a sentence (semantic-context) is best used:
  - a. **Over time**
  - b. When you are fluent
  - c. Only for class
  - d. Initially
3. The word mnemonic comes from the name for the Greek god of:
  - a. **Memory**
  - b. Language
  - c. Knowledge
  - d. Learning

*Note: The correct answer to each manipulation check is listed first and bolded.*

### Attitudes about Current Session

1. Today, you learned about how to increase your vocabulary. Do you feel you will use the strategies presented today in your language course?
  1. Definitely not
  2. Probably not
  3. Somewhat not
  4. Maybe / unsure
  5. Somewhat yes
  6. Probably yes
  7. Definitely yes
2. Why or why not?

### Attitudes about Previous Session

1. In the *previous* session, you learned about meta-cognition in general. Did you participate in the previous session?
  - a. Yes
  - b. No
2. Did you try to use the general meta-cognitive strategy given to improve your language learning and coursework?
  - a. Yes
  - b. No
3. Do you feel that the metacognitive strategy was beneficial?<sup>1</sup>
  1. Definitely not
  2. Probably not
  3. Somewhat not
  4. Maybe / unsure
  5. Somewhat yes
  6. Probably yes
  7. Definitely yes
4. Why do you feel the strategy was or was not beneficial?<sup>1</sup>

<sup>1</sup>Items 3 and 4 were asked only if participants answered “Yes” to Item 1.

### SILL Questions Relevant to Previous Session

Answer the following statements in terms of how well the statement **describes you**. Do not answer how you think you should be, or what other people do. There are no right or wrong answers to these statements.

1. I notice my target language mistakes and use that information to help me do better.
2. I try to find out how to be a better learner of my target language.
3. I have clear goals for improving my target language skills.
4. I think about my progress in learning my target language.
  1. Never or almost never true of me
  2. Usually not true of me
  3. Somewhat true of me
  4. Usually true of me
  5. Always or almost always true of me

## Appendix H. Session 3: Successful Listening and Motivation

### Intervention 3: Successful Listening and Motivation

[Click here to listen to an audio of this text](#) or you can read the information below.

In this session, we will discuss metacognitive listening strategies. Listening to your target language may seem difficult and overwhelming, but you can become more confident and accurate in your listening comprehension through these strategies: planning, monitoring, and evaluating.

Vandergrift (2004) suggests that these three strategies can be utilized for each listening task you complete as well as improving your listening skills over a longer period. First, reflect how to use these strategies short-term: for each learning task. Begin by determining your own level of listening. Where are you at now? Rehearse any language beforehand that may be needed to complete the listening comprehension task. Determine the strategies you will use to listen effectively, whether it be to pick up on intonations or key words throughout the speech.

Next, monitor your understanding of the speech as it progresses. Use the context and your background knowledge to decide if the speech is making logical sense. For instance, if a speech begins by discussing mountain climbing, then suddenly switches to a discussion about burgers, you may have missed something. If possible, utilize paralinguistic cues such as hand gestures, facial expression, or intonation to decide if your understanding seems to fit the cues of the speaker. Contemplate if you are working towards a “gist” (main concept) understanding or a more detailed understanding.

Last, evaluate your understanding of the speech at the conclusion. Determine if your understanding would be acceptable given the context and your previous knowledge. Remember the strategies you used to ensure your understanding and decide if these strategies were effective or not. Could you use a different strategy, or use that strategy differently next time? Repeat these steps each time you are assigned a listening task to effectively practice and improve your target language listening skills.

Next, consider how to improve your listening skills overall for the remainder of the semester or a longer period of time. Set listening goals that are obtainable and plan ways to achieve these goals. Consider opportunities to practice your target language listening skills outside of the classroom, such as watching films in your target language or communicating with a pen pal.

As you begin to practice, consider your learning goals. Are you working towards obtaining them in a reasonable manner? Based on your progress, decide if you can reasonably attain those goals or if you need to re-evaluate those goals.

Last, assess how your overall goals and plan are progressing occasionally. Do you believe your goals are attainable and if not, how can you make these goals attainable or set new ones? Decide if your plan for goal achievement has been effective thus far or if

you need to work towards a new plan to reach your goals. Evaluate the listening strategies and plans you have made and adjust accordingly.

Repeat these steps until you meet your goals. Then, set new goals and continue this cycle. The short-term and long-term cycle can help you to become a more motivated, more confident, less anxious listener pushing towards fluency.

To practice your listening skills, find media excerpts in your target language and listen for the gist or main points. This can include news or radio broadcasts, short TV shows, or even full-length films. If you are in your early stages of learning, use subtitles in English (or your native language) and work up to subtitles in your target language until you feel comfortable having no subtitles at all. You can think of these as training wheels to help you listen for comprehension and practice the metacognitive strategies of this lesson. You may even find it entertaining to find translation errors in the subtitles.

For the remainder of this lesson, I'd like to discuss some language learning motivation themes. At this point, you may be considering registering for your next semester of courses and thus it is important to mention motivation in learning your target language. Gardner and MacIntyre (1993) suggest that there are two learner orientations when it comes to learning a foreign language. Consider which of the two orientations (or what proportion of each orientation) you feel would describe you. Those with an integrative orientation are motivated to learn a new language because they also want to learn about the culture of the target language host country or want to assimilate or blend into that country. Those with an instrumental orientation are motivated to learn to accomplish a task, such as passing a course or advancing a career. Those with the integrative orientation should be aware that despite people being raised in similar backgrounds and cultural situations, speaking different languages could alter their worldviews. In other words, much of culture stems from the language itself and thus, by learning your target language you keep yourself from missing culture that is lost in translation (Emmitt et al., 2003).

Further, the best way to blend into your target language host country is to be able to communicate with native speakers. Whenever I feel I am struggling to grasp a linguistic concept, I imagine how magnificent it will be to chat with native speakers and learn more about the people in the country. Those with the instrumental orientation should be aware that foreign language learning improves the neural connections in your brain responsible for and adjacent to language processes (Genesee, 2000). This means as you practice, you increase your ability to learn not only language but also other skills as well.

Further, if you decided to market your language skills as an interpreter or translator, you would make a median wage of \$45,000 per year in a sector that projects to add 30,000 jobs to the U.S. market in the next 10 years (National Center for O\*NET Development, 2016). Whenever I feel I am not keeping up with my learning goals, I imagine how quickly I will be able to begin a career teaching languages when I can speak multiple. No matter your motivation to take a language course, consider the benefits a foreign

language will have for you.

This concludes session 3: Successful Listening and Motivation. Please return to the survey online, and we'll see you next time!

#### Manipulation Check

1. This intervention focused on how to improve your listening skills over two time points. Which of these is **NOT** one of the time points discussed?
  - a. **Over the course of a week**
  - b. Over each listening task
  - c. over the course of the semester
2. This intervention mentioned two types of motivation for learning a second language. Which of these **IS** one of the types of motivation mentioned?
  - a. **Integrative**
  - b. Intermittent
  - c. Interactive
  - d. Intermediate
3. One of the ways language learning can affect your brain includes improving neural pathways responsible for language **AND** adjacent neural pathways responsible for tasks other than language.
  - a. **True**
  - b. False

*Note: The correct answer to each manipulation check is listed first and bolded.*

#### Attitudes about Current Session

1. Today, you learned about how to be a successful listener. Do you feel you will use the strategies presented today in your language course?
  1. Definitely not
  2. Probably not
  3. Somewhat not
  4. Maybe / unsure
  5. Somewhat yes
  6. Probably yes
  7. Definitely yes
2. Why or why not?

#### Attitudes about Previous Session

1. In the *previous* session, you learned about how to increase your vocabulary. Did you participate in the previous session?
  - a. Yes
  - b. No
2. Did you try to use the vocabulary strategies given to improve your language learning and coursework?
  - a. Yes
  - b. No

3. Do you feel that the vocabulary strategies were beneficial?<sup>1</sup>
    1. Definitely not
    2. Probably not
    3. Somewhat not
    4. Maybe / unsure
    5. Somewhat yes
    6. Probably yes
    7. Definitely yes
  4. Why do you feel the strategy was or was not beneficial?<sup>1</sup>
- <sup>1</sup>Items 3 and 4 were asked only if participants answered “Yes” to Item 1.

#### SILL Questions Relevant to Previous Session

Answer the following statements in terms of how well the statement **describes you**. Do not answer how you think you should be, or what other people do. There are no right or wrong answers to these statements.

1. I watch target language TV shows spoken in my target language or go to movies spoken in my target language.
2. I read for pleasure in my target language.
3. I try to find as many ways as I can to use my target language.
4. I pay attention when someone is speaking my target language.
5. I try to find out how to be a better learner of my target language.
6. I look for people I can talk to in my target language.
7. I look for opportunities to read as much as possible in my target language.
8. I have clear goals for improving my target language skills.
9. I think about my progress in learning my target language.
10. I try to learn about the culture of target language speakers.
  1. Never or almost never true of me
  2. Usually not true of me
  3. Somewhat true of me
  4. Usually true of me
  5. Always or almost always true of me



## Appendix I. Session 4: Refining Writing Skills

### Intervention 4: Refining Writing Skills

[Click here to listen to an audio of this text](#) or you can read the information below.

In this point in the semester, you may have to write for your class. Producing language seems to be more difficult for language learners than comprehending language, so don't be too upset if you find writing and speaking to be a little tougher than you thought. Whether you are beginning to write sentences, paragraphs, or full essays, the writing process is relatively similar. Chenoweth and Hayes (2001) discuss the writing process in three steps: resource, process, and control. Consider these three steps as you write and use your metacognitive abilities to reflect on each step (Schoonen et al., 2003).

The resource level requires you to assess what resources you have available to you. What vocabulary words do you know and how can you string these words together? If you are writing an essay, how can you organize the ideas you can express? If you are able to use a dictionary, try to not rely on it too much but be aware that it is available to you as well. If you feel your resources are low, consider using metacognitive strategies to improve your vocabulary or your grammar knowledge. You can use mnemonic devices to get a basic grasp of new words and ask for help with your understanding of grammar—because help is another resource readily available to you! Also, be sure you understand the task you are working to complete. For instance, if you need to write an opinion essay about a book, did you understand the book enough to have a writeable opinion? Be sure you understand the instructions given to you. If instructions require a three-paragraph essay, consider the resources you will need to write three paragraphs versus just one paragraph.

The process level involves your ability to translate and revise. Begin writing and experiment with how you write. In your native writing, you probably have sentences of varied length and composition. Avoid falling into a foreign language rut where each sentence follows the same subject-verb-object pattern and try out new ways to put sentences or even paragraphs together. In other educational fields, this would be considered a “pre-writing” phase where you begin to write a first draft. This phase can be very difficult as it relies on your working memory instead of your long-term memory. It can be difficult to keep the task, the vocabulary, the organization, and the grammar in your mind simultaneously. You can metacognitively assess how well this task is going and find ways to free up some of that working memory.

When you write in your native language, you probably do not need to consider all of the vocabulary words you know that would fit a topic. Instead, you begin by organizing basic ideas that fit your task, then expand into sub-ideas, and finally create complete sentences that are grammatically correct. Begin to use this process with your target language. The more native-like (or automatic) your ability to produce vocabulary words becomes, the more working memory you will have free and available to organize your ideas.

In the control level, you begin to rely on your metacognitive abilities to put together all of your writing. At this level, you should look at your organization and ensure that it is in the best order for your task. Check that your grammar and spelling is appropriate and accurate, but do not be afraid to take a risk or two by writing a sentence in a way you maybe have not experienced yet. Proficient writers focus on the organization of their writing more than they focus on being exactly accurate, so do your best to focus on the same (Schoonen & de Glopper, 1996). This level is most difficult as it requires you to juggle your resource ability (vocabulary), your metacognitive ability (writing strategies), and your overall writing ability (organization and editing).

The more you practice using your working memory to balance all of the abilities, the easier it will become and the less working memory you will need to accomplish the task. Aside from writing texts for your course, try practicing in your free time. I find it best to write about something I enjoy or make it personal. Usually this involves writing post cards to family, writing captions for photos in my target language, or writing short pieces just for practice. Robertson (2010) also suggests writing cinquain poems. These are very short poems that follow a specific structure:

One noun  
Two adjectives  
Three gerunds (these are words that end in “ing”) or three verbs if your target language  
does not have gerunds  
A short sentence  
A single summary word

For instance, if I wrote about Norway:

Mountains  
Beautiful, Grand  
Hiking, Running, Leaping  
A breath of crisp air.  
Stunning.

Writing these cinquains requires you to reflect on a single topic and connect varying types of words, which can help improve your resource step in future writing. The best part is, these are relatively short so you don’t have to commit much time!

Maybe if you wrote a cinquain about this study it would be:

Language  
Complex, Intricate  
Learning, Comprehending, Producing  
Creating a stronger brain  
Metacognition.

This concludes session 4: Refining writing skills. Please return to the survey online, and we’ll see you next time!

### Manipulation Check

1. Good writers tend to focus more on \_\_\_ and less on \_\_\_\_.
  - a. **Organization; Accuracy**
  - b. Accuracy; Organization
  - c. Perfection; Risks
  - d. Risks; Perfection
2. Which of these is not a level suggested in this session?
  - a. **Construct**
  - b. Process
  - c. Resources
  - d. Control
3. Improving your vocabulary to be more automatic can help:
  - a. **Free up working memory**
  - b. Take up more working memory
  - c. Free up long term memory
  - d. Take up more short term memory

*Note: The correct answer to each manipulation check is listed first and bolded.*

### Attitudes about Current Session

1. Today, you learned about how to refine your writing skills. Do you feel you will use the strategies presented today in your language course?
  1. Definitely not
  2. Probably not
  3. Somewhat not
  4. Maybe / unsure
  5. Somewhat yes
  6. Probably yes
  7. Definitely yes
2. Why or why not?

### Attitudes about Previous Session

1. In the *previous* session, you learned about listening strategies. Did you participate in the previous session?
  - a. Yes
  - b. No
2. Did you try to use the listening strategies given to improve your language learning and coursework?
  - a. Yes
  - b. No

3. Do you feel that the listening strategies were beneficial?<sup>1</sup>
    1. Definitely not
    2. Probably not
    3. Somewhat not
    4. Maybe / unsure
    5. Somewhat yes
    6. Probably yes
    7. Definitely yes
  4. Why do you feel the strategy was or was not beneficial?<sup>1</sup>
- <sup>1</sup>Items 3 and 4 were asked only if participants answered “Yes” to Item 1.

#### SILL Questions Relevant to Previous Session

Answer the following statements in terms of how well the statement **describes you**. Do not answer how you think you should be, or what other people do. There are no right or wrong answers to these statements.

1. I think of relationships between what I already know and new things I learn in the target language.
2. I use new target language words in a sentence so I can remember them.
3. I connect the sound of a new target language word and an image or picture of the word to help me remember the word.
4. I remember a new target language word by making a mental picture of a situation in which the word might be used.
5. I use rhymes to remember new target language words.
6. I remember new target language words or phrases by remembering their location on the page, on the board, or on a street sign.
7. I use the target language words I know in different ways.
  1. Never or almost never true of me
  2. Usually not true of me
  3. Somewhat true of me
  4. Usually true of me
  5. Always or almost always true of me

## Appendix J. Session 5: Wrapping Up

### Attitudes about Previous Session

1. In the *previous* session, you learned about successful writing. Did you participate in the previous session?
    - a. Yes
    - b. No
  2. Did you try to use the writing strategies given to improve your language learning and coursework?
    - a. Yes
    - b. No
  3. Do you feel that the writing strategies were beneficial?<sup>1</sup>
    1. Definitely not
    2. Probably not
    3. Somewhat not
    4. Maybe / unsure
    5. Somewhat yes
    6. Probably yes
    7. Definitely yes
  4. Why do you feel the strategy was or was not beneficial?<sup>1</sup>
- <sup>1</sup>Items 3 and 4 were asked only if participants answered “Yes” to Item 1.

### SILL Questions Relevant to Previous Session

Answer the following statements in terms of how well the statement **describes you**. Do not answer how you think you should be, or what other people do. There are no right or wrong answers to these statements.

1. I use the target language words I know in different ways.
2. I write notes, messages, letters, or reports in my target language.
3. If I can't think of a word in my target language, I use a word or phrase that means the same thing.
4. I try to find as many ways as I can to use my target language.
5. I notice my target language mistakes and use that information to help me do better.
6. I think about my progress in learning my target language.
  1. Never or almost never true of me
  2. Usually not true of me
  3. Somewhat true of me
  4. Usually true of me
  5. Always or almost always true of me

Overall Study Attitudes and Final Demographics

1. Overall, did you feel that the tips provided this semester were beneficial to your language learning?
  1. Definitely no
  2. Somewhat no
  3. I feel neutral
  4. Somewhat yes
  5. Definitely yes
2. Why do you feel the tips, overall, were or were not beneficial?
3. What grade do you expect to receive in this class?
  - A
  - A-
  - B+
  - B
  - B-
  - C+
  - C
  - C-
  - D+
  - D
  - D-
  - F
4. Do you plan to take the next level class in [target language]? (Either 102 or 202 in the language you studied this semester?)
  - a. Yes
  - b. Maybe
  - c. No
5. Could you briefly explain your decision to take or not take the next class?

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