2019

Second Language Recall in Methods of Learning

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Walden University
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Abstract

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology

Walden University

May 2019

Abstract

This dissertation examined the relationship between the acquisition and recall of English language vocabulary. This study explored 2 different learning recall strategies to determine which approach was the quickest or more efficient way to remember vocabulary words. Previous researchers had focused on learning a second language phonetically and had not explored different instructional strategies to study the most useful or quickest way to learn a second language for adults. However, there remains an important gap in the current research regarding how to present different methods of instruction to acquire a new second language more rapidly. The purpose of this study was to determine which method was easier and quicker to assist the second language learner to recall and acquire vocabulary. The sample came from 3 different adult second language classrooms. The participants completed a pretest to assess their English word knowledge before the treatment. The participants had a timed 15-min or 30-min period to learn the cards for recall using flash cards with words only or with words and pictures. Once the period was over, the participants completed a posttest measure of language acquisition. There were no statistically significant differences in posttest scores based on method of learning, length of time for learning, or the interaction between the two. The results of the study added to the research on determining whether different instructional methods assisted an adult second language learner to acquire a second language more swiftly.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Introduction

In this chapter, I examine the relationship between the acquisition and recall of English language vocabulary through exploration of two ways of presenting new vocabulary through picture cards: words on cards and words on cards with a picture. My purpose in this study was to determine which method was easier and quicker to assist the second language learner in recalling and acquiring vocabulary. The importance of learning a second language has grown due to a globally interconnected world. Knowledge of a second language can contribute to national security goals, global economic competence, and cognitive achievement (Center for Applied Linguistics, 2004).

A language barrier among immigrants may contribute to racial tension. Speaking a second language facilitates better communication and interaction with individuals of diverse cultural backgrounds and native tongues, which leads to reduced miscommunication (Simona, 2016). Functional working relationships facilitate collaboration when people from different cultures interact directly or vicariously (Kurpis & Hunter, 2017). Sustainable relationships allow for the marketing of products and culture-specific beliefs that benefit both company and consumer.

People who learn two languages regularly maintain the languages (Elaine, 2015) and have more metacognitive awareness than those who master only one language. Learning a second language contributes to brain changes; in adolescents, these brain changes appear around the inferior parietal areas that process the sounds of words or their

meanings (HweeLing et al., 2007), playing a role in linking the primary components of vocabulary knowledge.

With regard to business and second language adults, Geospace and the U.S. Hispanic Chamber of Commerce (2015) produce an annual report to track the growth of Hispanic-owned businesses and their influence on the U.S. economy. In 2015, approximately 4 million Hispanic-owned businesses together contributed more than $661 billion to the U.S. economy.

This chapter includes the background, problem statement, purpose of the study, the research questions, hypotheses assumptions, attempt to resolve the research questions, definitions of the terms, theoretical framework, and significance of the study. Students, teachers, and materials writers agreed that learning new vocabulary is an important part of learning a new language (De Groot, 2006). However, the most efficient way to recall and learn new vocabulary remains unclear (Schmitt, 2008). Craik and Lockhart (1972) asserted that the more attention and manipulation given to an item, the higher the likelihood of recall. Mall-Amiri and Arabgol (2015) found, “It is important for teachers to be aware of students’ learning behaviors and use appropriate techniques for teaching vocabulary” (p. 170). With previous researchers focused on instructional strategies through a phonological approach, through this study, I further contribute to the research on instructional strategies for adult second language learners on acquiring vocabulary. Psycholinguistics provided the emphasis of instructional presentation, with a focus on processing and comprehending information (Rigler et al., 2015).

Background

Imbo and LeFevre (2011) explored adaptations of Belgian and Chinese culture when language tasks became difficult. Their goal was to investigate the differences between Belgians answering in their mother tongue on a task involving computation estimation, and Chinese-educated Asian participants using a nonpreferred language. The researchers noted Belgians answered the task in a more robust way than the Chinese-educated participants. In addition, Imbo and LeFevre (2011) found that working memory strategy selection differed across cultural groups. Chinese participants selected less adaptively when their working memory was taxed; in comparison, Belgian participants were not affected by the process of resolving a computational task in their second language.

Some researchers indicated the acquisition of a second language was easier when it was tied to emotion. Ponari et al. (2015) compared the differences between native language (L1) and second language learner (L2) processing based on the fact that L2s learned later in life would not be processed efficiently because of emotional associations established during childhood.

According to Jiang, Paulmann, Robin, and Pell (2015), human emotions function in a multitude of social functions, including discrete emotional meanings recognized through facial or vocal expressions, gestures, body movements, and language. Believing cultural variation and expression can mark emotions, the researchers created an aging paradigm to investigate the nature of in-group advantage in vocal emotion recognition by comparing two distinct cultures. The language created employed pseudoutterances to

convey four fundamental emotions, expressed in English and Hindi, presented to English and Hindi listeners (Jiang et al., 2015).

Rigler et al. (2015) reported that research usually involved language performance or linguistic knowledge based on age or language difficulties. Some researchers examined properties of language that have been learned developmentally or over a span of time. The field of psycholinguistics places more emphasis on language processing and comprehension (Rigler et al., 2015).

Problem Statement

Learning English as a second language (ESL) for Hispanic adults was distinctive when Spanish was the primary language (Coryell, Clark, & Pomerantz, 2010). Recent scholars have focused on language acquisition through phonological awareness and visual perception. Kotik-Friedgut, Schleifer, Golan-Cook, and Goldstein (2014) conducted a study involving a Lurian systemic-dynamic approach to teaching illiterate adults a new language based on cultural-historical approaches developed by Vygotsky, Luria, and cultural neuropsychology. The researchers examined the brain function as related to literacy acquisition by suggesting exercises allowing for the phonological awareness and visual perception that assists in learning to read and write (Kotik-Friedgut et al., 2014). To determine whether presentation affected a new phonological form, Hayes-Harb, Nicol, and Barker (2010) examined discrepancies between the letters that produced a sound grapheme (i.e., the phoneme and the manner in which the sound corresponds to a new language). According to Gontijo, Gontijo, and Shillcock (2003), "A grapheme was defined as a letter or combination of letters that represents a phoneme" (p. 136). An example is the word *thought* (Gontijo et al., 2003), which consists of seven

letters (*t, h, o, u, g, h*, *t*) and three graphemes (*th, oug, t*). The combination of phonological forms of words was different across languages (Gontijo et al., 2003). In the English language, the legal arrangements (graphemes) of 26 letters represent the 44 smallest speech sounds (phonemes) in the language (Chen & Savage, 2014). The assembly of word pronunciations comes through grapheme-to-phoneme components (Chen & Savage, 2014). The Spanish writing system has consistent grapheme-to-phoneme correspondence and makes the system clearer than English (Ijalba & Obler, 2015). Essential language-specific phonology and orthographic rules across languages may limit the reader (Ijalba & Obler, 2015). The orthographic system of Spanish supports the use of grapheme-phoneme mapping and decoding and is transparent, whereas the English system of grapheme-phoneme has many variations (Ijalba & Obler, 2015).

Engel de Abreu and Gathercole (2012) explored links between executive processes of working memory, phonological short-term memory, and phonological awareness as related to the proficiency of first, second, and third languages in children. The researchers found executive processing abilities, phonological short-term memory, and phonological awareness operated as separate but related constructs that showed differences in native and second language proficiency. Engel de Abreu and Gathercole (2012) further found phonological short-term memory was connected to vocabulary in first language learners, and the structure was comparable to second language learners. The executive processes were associated with grammar across languages, reading comprehension, and spelling. Engel de Abreu and Gathercole identified (2012) phonological awareness as making individual contributions to word decoding, spelling, and language proficiency with third language learners. They explored the acquisition of a

second language and the ability of English second language learners to use picture cards, words on cards, and words on cards with a picture to determine which technique was more efficient on recall for the second language learner.

Second language learners want to learn the language quickly to be able to assimilate and find a job to support their families. At this time, limited academic research exists due to limited thorough study of attainment of second language learners (Hellman, 2011). Rather, available researchers focused on learning language phonetically. Adults experience difficulties when pursuing a second language (Ruijuan, Ruiting, & Van Tai, 2014). There was a significant amount of research on language acquisition through phonics and through recognition of sounds, but limited studies based on learning and teaching approaches for adult second language learners.

The present study was important due to the examination of two strategies to learn a second language by recalling vocabulary and two strategies to teach vocabulary. Psycholinguistics places emphasis on examining language processing or comprehension (Rigler et al., 2015). The adult students acquired vocabulary quickly, through either picture cards or auditory assistance. These techniques assisted a second language learner in recalling and learning vocabulary needed to communicate, read, and write in a second language (Ijalba & Obler, 2015).

Purpose

This study was quantitative in nature and in it, I addressed second language learners who have Spanish as their primary language, with a focus on the acquisition of English language vocabulary through recall. I compared two ways of presenting new vocabulary through picture cards: words on cards and words on cards with a picture. The

purpose of this study was to determine which method was easier and quicker to assist the second language learner in recalling and acquiring vocabulary. The independent variables for the study were the approach of instruction and length of recall time. The dependent variable was the number of words learned through recall.

Research Questions and Hypotheses

The research questions guiding this study were:

RQ1: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning?

Null hypothesis: There is no statistical significance between two groups of adult second language learners' word acquisition recall, based upon method of learning.

Alternative hypothesis: There is a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning.

RQ2: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)?

Null hypothesis: There is no statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min).

Alternative hypothesis: There is a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method

of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min).

Framework

The theoretical framework for this study was Kahneman and Tversky's (1973) exemplar model of prediction and categorization. Kahneman and Tversky's work has appeared extensively in features of language acquisition. Nosofsky, Cox, Cao, and Shiffrin (2014) stated, "The model assumes that each item of a memory set is stored as an individual exemplar in memory. When a test probe is presented, it causes the individual exemplars to be retrieved" (p. 2). Information is easier to retrieve when the exemplar is similar to the test probe and has greater memory power (Nosofsky et al., 2014).

The approach provides details on the way people can predict and make judgments by using the information they have to make predictions when acquiring new knowledge. Further, subsequent research from Kahneman and Tversky (1973) provides guidance on ways to use the exemplar model toward the development of language acquisition, thus allowing for an understanding of language. The exemplar model has its basis on recall and retrieving information. The model related to this study in the area of word recall, with words presented to the participants, who then had to recall words through the use of retrieval and recall. This study allowed for the exploration of different memory approaches based on memory in Chapter 2.

Nature of the Study

The nature of this study was quantitative and focused on the number of words a second language learner can recall in 15 minutes when presented with picture cards, words on cards, and words with a picture. Participants were adult Spanish speakers

between the ages of 18 to 40 years who attend English as a Second Language (ESL) courses at an adult literacy center. The sampling technique was a convenience sample, which enabled data collection in a short amount of time. I visited every literacy class and provided each instructor with a set of cards. Instructors asked their students if they would like to participate in the study, and then they asked those who volunteered to sign a consent form and then take a card. Each card had a different symbol: the sun, the moon, or a star. Students who selected a card with a star symbol receive instruction to meet the researcher in the Center's lobby. The study took place in a designated classroom that used for Second Language Courses. The study design was to test a list of words that can be recalled in 15 minutes using picture cards, words on cards, and words with a picture. By observation, I determined if more time was needed for the participants to remember words.

Definition of Terms

ESL: English as a second language refers to an instructional program or curriculum in which nonnative English speakers learn the language (Echevarria, Short, & Powers, 2006).

Language acquisition: Language acquisition is the ability to perceive, understand, and produce words/sentences to communicate (Friederici, 2011).

Second language learners: These are individuals who are neither native nor fluent English speakers.

Word list recall: This is an exercise that determines how many words can be recalled by memory.

Assumptions, Limitations, Scope, and Delimitations

Possible limitations of this study were problems with sample size and collecting a large enough sample for the study. In addition, other factors may have affected the outcome of the study. Several independent and dependent variables could have influenced the results, such as the length of time a second language learner lived in the United States, the amount of English language the second language learner had or had not acquired while in the United States, and the cognitive abilities of the second language learner. The socioeconomic status and level of education the second language learner had received in the United States or in Mexico could also have influenced the results. The level of education did not make a significant difference and the socioeconomic status was not measured; had these been different, the results might have provided further information on the influence of socioeconomic status.

Even though there were limitations to the study, it yielded findings that contributed to research in the area of verbal memory recall, and the most effective and quickest way to acquire information such as vocabulary.

Significance

The significance of this study was its focus on visual (i.e., nonwritten) and auditory stimuli, which was a novel approach. The goal was directly relevant to second language learners who had Spanish as their primary language. The results may assist those who craft curricula for adults wishing to learn a language quicker and to apply and utilize their new language skills in different situations. Learning second language vocabulary may influence chances of employment.

Summary

In this chapter, I provided an introduction of the effects of learning and recalling vocabulary in 15 minutes and 30 minutes when presented with picture cards, words on cards, and words on cards with a picture. Included was a summary of the current literature and discrepancies on instructional strategies presented to adult second language learners. A review of the theoretical basis of recall and language vocabulary acquisition also appeared in this chapter. Chapter 2 provides a wide-ranging literature review on vocabulary acquisition, whereas Chapter 3 focuses on research design and method, research questions, and maintaining participant confidentiality.

Chapter 2 Literature Review

Introduction

Learning English as a second language is difficult for Hispanic adults whose primary language is Spanish (Coryell et al., 2010). Recent researchers have focused on the aspect of learning through phonological and visual perception, also providing a significant number of studies on language acquisition through phonics and sound recognition. This study was significant due to the exploration of two ways of learning a second language by recalling vocabulary, as well as two approaches to teaching vocabulary. Chapter 2 includes an overview of the literature addressing learning and teaching approaches for adult second learners: specifically, the naturalistic decision model, the lexical memory model, and the recognition prime model as theoretical frameworks. There is also a summary of the literature on second language learning strategies, vocabulary learning strategies, vocabulary learning and memory, memory access, and memory language learning.

Literature Review Approach

For the literature review, I accessed multiple sources in a comprehensive search. Scholarly databases included Education Research Complete, Education Resources Information Center (ERIC), Google Scholar, Google Books, PsycARTICLES, PsycBOOKS, PsycEXTRA, PsycINFO, and SAGE Premier. Research on second language learners was evidence based, using analysis of mixed methods, quasi-experimental design, and systematic review. The key terms that I used were *primary language*, *learning*, *vocabulary*, *second language*, *acquisition*, *grapheme*, *phoneme phonological awareness*, *visual perception*, *adult second language learners*, *child second*

language learners, *adolescent second language learners*, *adult vs. child second language learners*, and *adolescent second language learners*.

Publication dates primarily ranged from 2013 to 2018. Two articles from 2002 provided information about language acquisition and vocabulary strategies, whereas another one from 2003 focused on grapheme-phoneme probabilities.

Theoretical Framework

For this study, I used an exemplar model based on Kahneman and Tversky (1973), which emphasizes memory and language acquisition. Aspects of the exemplar model were prediction and categorization. Presumed by the model was that presentation of an item assisted the individual to retrieve information, particularly when the submitted information was similar to the inquiry (Nosofsky et al., 2014). The basis of the exemplar model was the retrieval of information from long-term memory after a short probe, tied to the accumulation of data leading to decisions about information (Nosofsky et al., 2014). Information retrieved had been stored in different categories. According to Nosofsky (2015), categorization has different functions, a major one being "that it facilitates the making of inferences. If one learned that an object is a member of the category 'fruit,' then a reasonable inference was that the object has seeds" (p. 1,929). In an exemplar model, people stored instances concretely and engaged with the information by associating a similar process to retrieve the information and then made inferences about the new information (Hawkins, Hayes, & Heit, 2016).

My goal for the study was to present novel vocabulary, with which the participant interacted for 15 minutes or 30 minutes. After this time, the individual used the vocabulary probe to pull from memory and make inferences about the word. According

to Hawkins et al. (2016), inductive inferences do not occur immediately. The presented task will signal retrieval of earlier experiences (Hawkins et al., 2016).

Language learning starts with words, which are the building blocks to language proficiency (van Hell & Tanner, 2012). Word building blocks constitute a language learner's vocabulary, which is why vocabulary tests became popular in language learning more than a century ago. Researchers determined a rich vocabulary placed a learner in an advantageous position for learning. By knowing more words, learners understood teachers and textbooks better in the learning process, thus acquiring more words in less time. Even though learners with similar vocabulary volumes can differ in their knowledge and background, vocabulary size is an indicator in general competence in language learning, particularly in second language learning (Kaplan & Holland, 2013).

Because of the importance of vocabulary in language learning, linguists often use vocabulary as measures in language learning studies, such as reading and writing abilities, learning attention, learning emotions, and learning memory (McCutchen, 2011). The last century saw a notable decline in using vocabulary in linguistic studies, which were replaced by grammar, pronunciation, and reading and writing. Nonetheless, vocabulary acquisition was an important aspect in language learning. Revived interest in words and vocabulary in second language learning is occurring, as researchers consider vocabulary learning a critical factor and the most challenging aspect in language proficiency (Oxford & Lin, 2011). After a comprehensive literature search, I found only limited studies about the attainment of second language learning, and thus I identified a research gap in vocabulary memory acquisition related to visual and auditory stimuli.

If language is taken as a building, grammar is the structure and vocabulary is the bricks (Gass, 2013). Both structure and bricks are important, but the number of bricks exceeds the one of the structure, which was the reason linguist agreed vocabulary acquisition dominated the language field as the main obstacle or key to second language learning. The lack of vocabulary prevented second language learners from being proficient and effective in reading, writing, and listening. Vocabulary was also the most frequent problem in second language learners, particularly adult learners who often seek better vocabulary instructions (Laufer & Waldman, 2011). As the most intriguing and challenging aspect, vocabulary acquisition starts from the beginning and lasts long after all other aspects in second language learning. Due to the long-lasting and complex process of vocabulary acquisition, understanding was historically limited (Nagy & Townsend, 2012).

Multiple theories and hypotheses are available in the literature to identify aspects involved in vocabulary acquisition. Considered necessary in learning are a word's sound, spelling, meaning, and role in the language (Leung & Williams, 2012). The form, meaning, and use of a word are components of learning that make learning vocabulary a challenging and long-lasting acquisition requiring multiple exposures.

The initial stage of vocabulary acquisition is to connect its form to the meaning of a word and to fix the connection in a learner's mind (Leung & Williams, 2012). This process involves multiple incremental aspects, such as other meanings, uses, associations, and colocations, which can be acquired in the later stages of second language learning. Considering the need to learn more than 3,000 words even in the initial stages, effective strategies are necessary in any language learning, especially second language learning

(Schmitt & Schmitt, 2014). Multiple linguistic researchers argued that proactive strategies were required in effective vocabulary expansion and second language learning.

In this chapter, I review the literature published in the years 2013 to 2018, focusing on second language learning strategies, vocabulary learning strategies, vocabulary learning and memory, memory access in current expertise, and language and memory learning in adult second language learners.

Naturalistic Decision Model

Proposed by Klein and Klinger in 1993 as cited in Klinger, Andriole, Militello, Adelman, and Klein (1993), the naturalistic decision model applies to learners' decision-making when faced with challenges such as uncertainty, time pressure, and complex and dynamic learning environmental conditions. Klein (2015) further developed this model to include two simple recognition processes to define the issue: evaluation and modification process to evaluate the issue and modify previous decisions to fit current situations; and a reassessment and implementation process for reevaluating and implementing the best action when a situation is different from the previous one.

The naturalistic decision model includes five approaches (Klein, 2015), which are (a) use tactical decision games to help individuals become better decision makers, designed as short paper-and-pencil scenarios to describe a situation and resources available, followed by the introduction of an unexpected and challenging twist requiring a rapid decision; (b) teach doctrine representing best practices to reduce the chances of a coordination breakdown; (c) teach structural relations based on collecting scenarios; (d) rely on actual workplace experiences to provide on-the-job learning activities with potential to boost tacit knowledge; and (e) use a scenario-based method akin to tactical

decision games to have learners address decisions in the midst of scenarios presented in paper-and-pencil format. The purpose of the naturalistic decision model is to provide a perspective on the topic of improving intuitive decision making (Klein, 2015). Researchers using the model give greater prominence to the role of experience, having studied decision-making in actual contexts instead of using laboratory tasks. They were less interested in teaching decision strategies, and more so in helping learners gain experience quickly and make sense of complex situations as a knowledge and conceptual base to make intuitive judgments.

Even though the origin of this model was not language learning but firefighter practice, scholars have successfully applied the model to second language memory, which resolved issues in lexicon learning practice and repetition underlying the cognitive process (Segalowitz & Hulstijn, 2009). Use of the naturalistic decision-making model helped improve skills and automaticity for learners to perform lexicon learning. Better decision-making assisted learners to recognize letters and words effortlessly, unconsciously, and rapidly.

Lexical Memory Model

Based on learner capability to memorize vocabulary with its meaning in a large volume, lexical memory model researchers focused on long-term memory, and how learners access and organize it (Nickerson, 2011). A typical study of the lexical memory model is crossword puzzle memory, because highly developed skills in crossword solving belong to cognition and memory categories, subsequently applied to linguistic learning (Toma, Halpern, & Berger, 2014). As such, crossword memory researchers revealed

useful notions and strategies for the understanding of advanced memory and retrieval skills in current vocabulary memory research.

For example, a popular crossword strategy called *semantic clues* helped individuals organize words, with each word defined as a set of meaning features (Nickerson, 2011). In this way, defining a word included its abbreviated definition, synonym, association with other words, and general knowledge information. Semantic clues aided in studying the ways lexical memory was organized in the brain to benefit second language learners in vocabulary knowledge expansion and word senses (Toma et al., 2014). As such, lexicon appeared as a crossword puzzle, with semantic clues to help learners relate new words to learned words, and to grow their vocabulary knowledge faster and deeper.

Recognition-Primed Decision Model

The recognition-primed decision model stemmed from crossword skills, as well, first defined by adapting another decision-making model, such as the Bayesian recognitional decision model (Mueller & Thanasuan, 2013). This model incorporated both semantic and orthographic information to use experience as a recognition memory for future decision-making. It relied on computerized systems to compute a probability of a clue's answer from databases (semantic), as well as pairs of letters answers (orthographic; Ginsberg, 2011). Learners used both semantic and orthographic routes to access lexical memory independently, but to perform retrieval process similarly.

Assumed under this model is that, during the cognitive process, the brain evaluates the strength between a word and its answers from both semantic and orthographic routes, subsequently choosing the answer with the greatest likelihood

(Mueller & Thanasuan, 2013; Thanasuan & Mueller, 2014). As such, I used this model to design word games based on learners' various fluency levels and lexical sizes for the purposes of vocabulary examination and improvement. The model proved useful in designing computational learning programs to improve vocabulary and English skills via both semantic and orthographic routes (Thanasuan & Mueller, 2014). Researchers have confirmed this model to be more effective in promoting human language learning as compared to other bilingual models.

A summary of the literature on language and memory learning and its impact on adult second language learners follows.

Second Language Learning Strategies

Since the 1980s, researchers focused on second language learning shifted from teaching methods to learning process, indicating learning success required not only teaching strategies, but also learning strategies (Benson, 2013). Since individual differences in characteristics and capabilities influence the acquisition process and efficiency, learners need to take the advantage of learning strategies to increase learning opportunities and enhance learning outcomes.

In the literature, linguistic researchers defined learning strategy differently based on their research targets and interests. For example, Oxford (as cited in Griffiths & Oxford, 2014) defined it as behaviors and actions used by learners to make language learning successful, enjoyable, and self-directed; Cohen (as cited in Griffiths & Oxford, 2014) saw it as processes selected by learners to enhance the use of second language; and Purpura (as cited in Griffiths & Oxford, 2014) defined it as conscious and unconscious activities used and tested in language learning processes. Nevertheless, the importance of

learning strategies in second language appeared in the fact that successful learners employ learning strategies more frequently, appropriately, and consciously compared to less-successful learners (Griffiths & Oxford, 2014).

Recently, the emergence of learner-centered classrooms contributed to the initiation and development of learning strategies. Researchers sorted second language learning strategies into four categories: cognitive, metacognitive, social, and socioaffective (Bidabadi & Yamat, 2011). Cognitive strategies stemmed from language processing in the mind to use, receive, store, and retrieve learning information; metacognitive strategies came from knowledge such as arranging, planning, and evaluating in learning tasks; social strategies were about cooperation with teachers, learners, and native speakers; and socioaffective strategies assist in dealing with learning stress through promoting relaxation and lowing anxiety (Bidabadi & Yamat, 2011).

Since this study was about vocabulary learning, a specific review of learning strategies appears in the next section.

Vocabulary Learning Strategies

The definition of vocabulary learning strategies varies between authors. For example, Rubin (as cited in Saengpakdeejit, 2014) identified a vocabulary learning strategy as "the process by which information is obtained, stored, retrieved, and used" (p. 150), whereas Catalan (as cited in Saengpakdeejit, 2014)defined it as "[k]nowledge about the mechanisms (process, strategies) used in order to learn vocabulary" (p. 147). As such, there exists a tight link between vocabulary learning strategies and memory, since the strategies were useful not only to discover word meaning, but to retain words in learners' memory for a long term and to be recalled when later needed.

In second language learning, vocabulary requirements often outstrip learners' capabilities. Triggered by a large number of new words needed were linguistic studies to find effective vocabulary learning strategies to facilitate learning (Douglas, 2014). As mentioned, learners differed in strategies used and the subsequent effectiveness of the same strategies (Griffiths & Oxford, 2014). This points to the demand for different vocabulary strategies to target learners with varying needs, such as inferencing strategies, resource consulting strategies, incidental learning strategies, and memory-based strategies. Researchers have found the conscious and coordinated uses of vocabulary learning strategies directly associated with proficiency and achievement in second language learning (Douglas, 2014).

Vocabulary learning strategies fall into the categories of cognitive, metacognitive, social, learning belief, and memory (Oxford & Lin, 2011). As a subgroup of second language learning strategies, these strategies are both similar to and different from the latter. Vocabulary learning strategies differed between authors, and the lack of unified classification made it difficult to compare research results and findings (Oxford, 2011). I expect clearer and more reliable categories of vocabulary learning strategies will come about to support future studies.

Researchers identified learners as actively using vocabulary strategies more frequently than other language learning strategies. Consequently, researchers paid more attention to related strategies, taking vocabulary learning strategies without focusing on classification (Douglas, 2014). For example, Gu (2002) compared vocabulary strategies between cognitive, metacognitive, and learning belief strategies and found learners combined different vocabulary strategies in their learning process. In this study, the

highest-scoring learners did not believe in strategies but relied on natural exposure; the second-best learners used all strategies specified above, with positive evaluation of natural acquisition and word memorization; and the lowest-scoring learners relied upon only one category of vocabulary strategy: visual repetition and memorization. Gu (2002) concluded that multiple vocabulary strategies yield better vocabulary size and language proficiency, which should be combined with other language strategies in effective learning. Alhaqbani and Riazi (2012) found both good and poor second language learners used macrostrategies, such as practicing, note-taking, dictionaries, and memorization; the difference was that good learners used words in context to test themselves while practicing, something poor learners did not do.

A discussion of vocabulary learning strategies follows, including cognitive strategies, metacognitive strategies, social strategies, learning belief strategies, and memory strategies.

Cognitive Strategies

Cognitive strategies are similar to memory strategies with less focus on manipulative processes (Schmitt & Schmitt, 2014). They include verbal and written repetition, together with other mechanical means such as word lists and vocabulary notes to link a word's meaning to a physical object. Cognitive strategies help to manipulate and transform the language through repetition, or repeating a word until it is learned by heart (Bland, Topping, & Wood, 2011). Typical repetition processes are to memorize word lists or repeatedly self-test, eliminating the known words until proficiency.

Metacognitive Strategies

Metacognitive strategies include a conscious overview of a learning process to make decisions about planning, evaluating, and monitoring the best way to learn (Lai, 2011). They require learners to review, optimize, and improve their learning methods to find the most efficient way of learning. To achieve optimized learning, learners needed to expose themselves to all possible means of knowledge, including books, the Internet, and videos, and to engage in communicative activities with native speakers. In addition, they should use self-testing to ensure their lexical acquisition is efficient, proper, and accurate, and to determine if the strategies used meet their requirements.

Social Strategies

Social strategies rely upon interaction with teachers, learners, and native speakers to improve vocabulary learning (Oxford, 2013). Here, teachers may provide answers, definitions, equivalent terms, or synonyms to an unfamiliar word; learners may help fill knowledge gaps or learning activities; and native speakers may help improve understanding of words. As such, social strategies helped learners study through communication and interaction with double-dimension learning as meaning determination and knowledge consolidation.

Learning Belief Strategies

The definitions of learning beliefs varied between researchers. For example, Benson and Lor (1998) identified them as the conceptions of learning concerned with what learners believe are the objects and processes of learning (Birjandi & Mohammadi, 2014). Individuals used learning belief in almost all aspects of second language learning, including reading, writing, listening, and vocabulary learning. Rashidi and Omid (2011)

investigated the role of learner beliefs in vocabulary learning and found using rote memorizing less effective than reviewing memorizing based on the second language learner's beliefs. Even though learners believed rote learning worked better, particularly under time pressure such as before exams, reviewing memorizing proved the most effective in vocabulary learning strategies.

Memory Strategies

Memory strategies involve connection made between new words and previously learned knowledge through imagery (Zahedi & Abdi, 2012). These strategies incorporate an elaborative mental process to facilitate long-term retention and store words into learners' memory. Memory strategies "make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Zahedi & Abdi, 2012, p. 2266). Such tools often helped learners who had difficulties and problems in memorizing large amounts of vocabulary to achieve proficiency, and they played an important role in overcoming memorization problems.

Memory strategies are the ones most studied by researchers (Asgari & Mustapha, 2011). In comparing the use of cognitive, metacognitive, social, and memory strategies, Morrison and Chein (2011) identified memory strategies as the ones most often used. Such strategies are valuable in verbal and written repetition, spelling studying, saying words aloud, and guessing from context. Newer learners tended to use memory strategies in word lists and cards, forming focusing and repetition; in comparison, mature learners often relied upon deeper strategies such as analysis, association, and imaging.

Because I focus on memory learning, additional reviews about the relationship between vocabulary learning strategies and memory follow.

Vocabulary Learning and Memory

Memory-related learning strategies include the use of word lists, flash cards, oral and written verbal rehearsal, and mnemonics to enhance learner recall at a later time. A review of these strategies follows.

Memorizing Learning from Word Lists and Flash cards

For decades, word lists and flash cards have been a part of second language learning for memorizing words (Kalajahi & Pourshahian, 2012). However, due to criticism, the communicative process is no longer a part of these learning processes, something once considered a tool in helping learners' memory in learning practice. Most recently, linguistic researchers disagreed with the criticism because, even though advanced learners benefited from memorizing words in a communicative context, beginning learners require word lists and flash cards to facilitate word memorization, particularly for words presented as translation pairs (Ehri, 2013).

Lee and Macaro (2013) compared vocabulary learning between new and advanced learners, finding higher retention scores with minimal context of word lists and less information given, particularly in new learners. In addition, learners memorized word lists with first language translation more effectively than lists with second language translation. Lee and Macaro (2013) suggested it was better for new learners to present vocabulary as bilingual lists without authentic context. The use of first language as translation in word lists appeared in other studies, as well. Laufer and Waldman (2011) compared word lists translated into either first or second language and found new learners learned more effectively with the word lists translated into their first language. This was because they did not need to guess the meaning as with using second language–

translated word lists, even though the word list with first language translation did not improve their word use ability in their second language learning.

Other researchers consider memorizing with flash cards more efficient when compared to word lists. Dunlosky, Rawson, Marsh, Nathan, and Willingham (2013) used flash cards with a word system of repetition and retrieval at longer intervals to prove an effective flash card system more flexible in vocabulary memory because it enabled learners to combine cards based on their needs, and thus increased their efficiency in learning memory.

Memorizing Learning from Oral and Written Verbal Rehearsal

Attention is an important factor in learning memory. Crowder (2014) confirmed the need to process words in full attention for them to stay in the memory for a longer time. As such, learners can use oral and written verbal rehearsal to direct their full attention to connecting meaning to form in a word, an explicit process establishing a connection between current analysis and elaboration to previous knowledge. Yu (2011) also demonstrated the efficiency of oral and written verbal rehearsal in learning memorizing through full attention and deep processing.

Memorizing Learning from Mnemonics

Mnemonic strategies were part of memory strategies using cognitive functions to promote word learning through retention and retrieval, which include visual, verbal, or mixed strategies (Tavakoli & Gerami, 2013). For example, they can be visual and sound applications, verbal elaboration, rhyme uses, time interval reviews, physical responses, and mental association.

A well-known mnemonic strategy, keyword strategy, connected the form and meaning of a word using acoustic and imagery connections (Al-Zahrani, 2011). Keyword strategy comprises two steps: acoustic link, or connecting the sound of a word to a keyword in one's first language or a well-known keyword in the second language that sounds similar, which was called an acoustic link; and imagery link, forming a mental image to graphically interact between the word and its translation.

According to Tootkaboni (2012), the keyword strategy is more effective in word memory compared to using images, synonyms, or context alone; thus far, however, it is not widely used in word memory because the association or connection of new words is more elusive, particularly for words related to abstract concepts. Researchers have devoted study to designing experimental conditions in computer-based programs in keyword strategy development (Cohen, 2014), which they expected would be the future in exploring opportunities of the application of keyword strategy in vocabulary learning memory.

Because memory is closely related to vocabulary learning, I review current expertise in memory access and understanding in the next section.

Memory Access in Current Expertise

Memory is a critically important part of cognitive language performance in second language learners. Current studies related to vocabulary memory appear in three research models—naturalistic decision model, lexical memory model, and recognition-primed decision model—reviewed as follows.

Language and Memory Learning in Adult Second Language Learners

Researchers of second language learning in adult learners focus on language acquisition through phonological and visual recognition (Kotik-Friedgut et al., 2014). Both phonological and visual recognition functions of the brain in memory are important in literacy acquisition to assist in reading and writing, reviewed separately as follows.

Language acquisition through phonological memory. Researchers used multiple approaches in the studies of language acquisition through phonological recognition, such as a sound grapheme, defined as a letter or a combination of letters that represent a phoneme (Gontijo et al., 2003). Gontijo et al. conducted a study to examine discrepancies between the phoneme and the pronunciation manner specific to the language. For example, the word *thought* consists of three graphemes (*th*, *oug*, and *t*), which represent a grapheme combination unique to English (grapheme features vary between languages).

In the English language, graphemes of the 26 letters represent the 44 smallest phonemes, with word pronunciations through the use of grapheme-to-phoneme components, which are inconsistent in English (Chen & Savage, 2014). Compared to English, the Spanish language is significantly more consistent in its grapheme-to-phoneme correspondence, making the language clearer and easier to learn by second language learners (Ijalba & Obler, 2015). As such, the orthographic system in Spanish language was transparent and consistent when used to support grapheme-to-phoneme mapping and decoding, but the same system in the English language has variations, making memorization in learning more difficult.

In an attempt to determine if the decoding skill was related to or predictive of second language learning efficiency, Meschyan and Hernandez (2002) studied word decoding ability in native language to predict individual differences in second language learning. The researchers measured native language decoding skill using the Word Attack of the Woodcock Reading Mastery Test; second language decoding skill by the second language word decoding task; native language competency using V-SAT scores; and second language competency using a questionnaire testing grammar, vocabulary, and reading comprehension ability (Meschyan & Hernandez, 2002). The authors found that, first, native language decoding skill may predict native language competency in college-age adults. Second, it may also be predictive of second language competency in the same set of adults, which was mediated by the second language word decoding ability from the adult learners. Finally, they found the native language decoding skill useful to predict course grade in second language learning in the first quarter. Results confirmed second language learning ability depended on phonological-orthographic ability in native language in adult learners, particularly during the early stage of second language learning.

Language acquisition through visual memory. Other researchers have focused on a close relationship between visual attention and visual working memory. Won and Jiang (2015) deemed working memory attention directed, because rehearsal in spatial working memory depends on spatial attention. In addition, when the researchers imposed a visual working memory load, it diminished the effectiveness of explicit attention but did not interfere with probability attention (Won & Jiang, 2015). The results indicated

that working memory shared similar mechanisms with explicit and goal-driven attention, but was not associated with implicitly learned attention.

Raghubar et al. (2015) studied visual attention and visual working memory using a neurobiological and behavior model in mathematical cognition. The researchers employed model-driven assessments of attention and working memory in 9.5-year-old children with math difficulties and attention deficits to directly measure putative relations between attention and memory processing in math learning. They measured attention using the attention network test, and assessed verbal working memory and visual spatial working memory with the number reversed task and Wechsler Intelligence Scale for Children (2008) respectively. Raghubar et al (2015) found attention was not a significant mediator for any aspect in math, visual-spatial working memory mediates math fluency, and verbal working memory and visual-spatial working memory mediate math calculation. The authors found the results unsurprising, because working memory is known for its involvement in attention shifting, inhibition, monitoring, and retrieval of long-term memory. Even though both verbal working memory and visual-spatial working memory contribute to cognitive learning, they may be differently targeting specific cognitive skills (Raghubar et al., 2015). For example, verbal working memory may be appropriate to target familiar and easy skills and concepts, and visual-spatial working memory appropriate to target problem-solving for new and difficult skills and concepts in learning.

Researchers empirically investigated the robustness of discrepancy between verbal versus visual learning memory. Sozda, Muir, Springer, Partovi, and Cole (2014) explored the potential mechanism in verbal and visual performance and found that, while

verbal learning and memory was significantly reduced by brain injuries, visual learning and memory remained largely intact. The researchers did not, however, obtain the same findings in either verbal versus visual performance or premorbid verbal abilities. In addition, Sozda et al. (2014) found symptoms of depression but not stress disorders associated with reduced verbal and memory learning, indicating the potential for cognitive strategies to improve verbal learning and memory difficulties, particularly through visual recognition functions.

Stipek and Valentino (2015) examined whether changes in working memory and attention could be used to predict learning capacity. They found working memory and attention have strong and positive effects on learning outcomes in early childhood, but less so or not at all in later years. These results suggested that attention and memory-developing effort may work better in the early ages, but for later ages, learning and memory strategies should focus on subject matter learning to improve achievement.

To research visual complexity and visual working memory, Sherman, Grabowecky, and Suzuki (2015) examined art preference under the influence of compatibility between visual complexity and visual working memory. The authors found art appreciation increased when visual complexity in an artwork was compatible with visual working memory capacity (Sherman et al., 2015). Results highlighted the importance of the interaction between visual features and visual memory capacity, a connection explored in second language learning to link visual feature and word memory capacity to increase vocabulary proficiency.

One of the subcategories of visual memory, episodic memory is a complex construct at both the phenotypic and genetic levels. Squire, Knowlton, and Musen (1993)

defined episodic memory as a memory of experiences and events, with information about spatial and temporal contexts. The majority of past researchers designed their studies on episodic memory without considering complex phenotypic and genetic architecture, which may not fit well based on neural correlates. As researchers targeted working and episode memories as well as different subtypes of episodic memory, they conducted studies including verbal memory only, immediate recall only, combined immediate and delayed recall, or verbal and visual-spatial recall. Using multivariate genetic approaches to fully understand complexity in episodic memory, Panizzon et al. (2015) studied factors affecting episodic memory, such as age-related cognitive ability and change, using twin modeling to determine both genetic and environmental factors. From a study with 1,237 twins ages 51 to 60 years, they found immediate and delayed recall functions could be combined for use in episodic memory strategies. However, separated immediate recall and delayed recall or separated verbal and visual-spatial factors are poor fits to the data (Panizzon et al., 2015). Results indicated appropriate combinations of factors and strategies in language learning memory may yield better language-learning proficiency.

Additional researchers explored episodic memory and cognitive functions in learning memory. Since cognitive functions change as learners become older, some functions increased, such as verbal ability, social skills, and perhaps wisdom; however, most aspects of cognition show age-related decline, particularly episodic memory (Newson & Kemps, 2006). The central roles of episodic memory were cognition aspects, from autobiographical recall to abstract reasoning. The age-related decline of episodic memory manifests in disturbed language learning, although interventions may slow, prevent, and even reverse the age-related memory decline. Healey and Kahana (2016)

explored age-related context maintenance and the retrieval model in episodic memory to test free recall and recognition tasks in younger and older learners, deriving measures useful to show age-related stability and decline in memory. They identified four required components when designing and building aging memory systems as attention across an encoding episode, ability to use retrieval cues, ability to monitor retrieval and reject intrusions, and noise level during retrieval competitions (Healey & Kahana, 2016). Later researchers have used or considered these components when designing studies to enhance language learning memory for adult second language learners.

Language acquisition using both phonological and visual memories. Recent researchers have advanced the traditional learning memory strategies considered separately, phonological and visual memories, applying strategies involving both phonological and visual memories. The combination strategies were more natural and closer to practical second language learning processes, and thus yielded better memory and learning proficiency. Studies related to both phonological and visual memories are relatively new and rare, as discussed next.

Vocabulary memory learning differs between first and second languages in adult learners. For example, adults may need to learn new words in their first language when they seek to learn a new discipline, while also needing to learn new words when they acquire a second language. In the case of vocabulary memory in first language, learners needed only to learn a new concept with its associated label; in the second language, they needed to associate a new label with a familiar concept in their first language. Researchers found phonological and orthographic representations of words to interact in

second language learning process (Escudero, Hayes-Harb, & Mitterer, 2008; Ota, Hartsuiker, & Haywood, 2009).

Hayes-Harb et al. (2010) investigated the relationship between phonological and orthographic representations of new words learned as first language or second language by adult learners. They sought to determine if learners recruited the knowledge of letter-sound (or grapheme-phoneme) correspondences when it was detrimental or irrelevant to the learning task. The authors used a set of auditory-presented pseudowords to imitate second language learning situations with pictures indicating their "meanings," with these pseudowords next learned by native English speakers. All participants heard the same auditory stimuli and saw the same pictures; the difference was that the first and second groups received written stimuli consistent or inconsistent with English spelling convention, and the third group received no written forms. Hayes-Harb et al. (2010) found those learners given written forms inconsistent with English spelling conventions showed interference in their leaning processes. The authors concluded the study represented an initial attempt to test the orthographic contamination of phonological representation in new word learning. It showed that orthographic information may interfere with lexical phonological representation development in new word learning and memory in second language practices.

Researchers have explored the links between phonological memory and visual working memory by comparing learning consequences in first and second languages. Cross-language linguistic studies demonstrated that phonological awareness and vocabulary memory were correlated in second language learning and outcomes (Gottardo, Collins, Baciu, & Gebotys, 2008). When working memory was under control,

phonological awareness from first language made a unique contribution to second language reading and acquisition (Swanson, Orosco, Lussier, Gerber, & Guzman-Orth, 2011). Swanson et al. (2011) explored whether the contribution of visual working memory to second language learning accounted for processing efficiency at a phonological level or if it is independent of phonological processing. In this study, the researchers examined students in Grades 1 through 3 with Spanish as first language through short-term cognitive memory, working memory, rapid naming, random letters, vocabulary, and reading measures in both languages: Spanish as first and English as second. The authors used hierarchical regression analysis to show that through phonological processing together with naming speed and inattention, both short-term memory and working memory contributed significantly to second language learning and vocabulary memory (Swanson et al., 2011). When they compared first and second languages, the regression analysis did not show significant differences in cross-language effects. The authors concluded that both short-term memory and working memory had unique variance to second language reading and acquisition beyond the contribution of the phonological processing skills from first language.

In a study combining phonological and visual memory, Engel de Abreu and Gathercole (2012) investigated relationhips between phonological awareness, phonological short-term memory, visual working memory, and language proficiency. They used a Luxembourgish Spoonerism Task to evaluate phonological awareness, Expression One Word Picture Vocabulary Test to measure phonological short-term memory, single-word reading test to measure visual working memory, and Test for Reception of Grammar to measure language proficiency. The authors found phonological

short-term memory uniquely connected to visual vocabulary learning in first language learners, in which the memory structure is comparable to second language learners (Engel de Abreu & Gathercole, 2012). In addition, they connected the phonological awareness in first language learners to third language learners through word decoding, spelling, and language proficiency, yet with a structure different from the third language. Furthermore, even though phonological processing ability was critical for learning new languages, executive processes have general connections to higher-order linguistic abilities in second language learners. As Engel de Abreu and Gathercole (2012) concluded, long-term lexical knowledge in first language plays a critical role in second language learning; however, native language may diminish basic cognitive gain as the familiarity of first language increases. Notably, basic phonological processing abilities in native language served as an important springboard to success in second language learning with an unfamiliar phonology. Executive processing of visual working memory made general but nonspecific contributions to second language learning, possibly because attention control mechanisms maintained crucial information and regulated complex and effortful learning activities.

Literacy had an impact on all cognitive functions. In addition, second language learning reinforced fundamental abilities such as phonological awareness, verbal and visual memory, executive function, and visuospatial skills. In these higher-level mental functions, visual symbols mediated the visual-auditory link in reading, because the brain integrated signals specialized for the processing of phonological, visual, and linguistic learning information (Ben-Shachar, Dougherty, Deutsch, & Wandell, 2011). The process of learning built a relationship between sounds and graphic symbols to synthesize the

symbols into meaningful words and sentences. To overcome second language learning difficulties from new immigrants to better meet their social and vocational needs, Kotik-Friedgut et al. (2014) revised an existing model of literacy teaching for adults to develop a neuropsychological model for multicultural communicative learning purposes, which was based on cultural-historical approaches from Vygotsky (1998, as cited in Kotik-Friedgut et al., 2014) and Luria. The authors added to the model exercises to train phonological awareness and visual perception in learning processes of reading and writing. Results showed 45 learners who received the training model had significantly better scores compared to students who received conventional training for an equivalent number of training hours (Kotik-Friedgut et al., 2014). The training effects appeared as word and sentence production from pictures and letter recognition to increase self-efficacy in language learning. Similar programs applied as a neuropsychological platform may assist adult second language learners who are illiterate and lack formal schooling (Kotik-Friedgut et al., 2014).

Several factors can affect vocabulary memory and language learning, such as age, emotion, and memory strategies, described as follows.

Age. As reviewed, several researchers have shown age may affect second language learners in vocabulary memory and language learning. For example, Stipek and Valentino (2015) suggested attention and memory-developing effort may work better in the early ages, but for later ages, learning and memory strategies should focus on subject matter learning to improve achievement. In addition, Healey and Kahana (2016) explored age-related context maintenance and retrieval models in episodic memory. The authors found four components necessary when designing and building aging memory system:

attention across an encoding episode, ability to use retrieval cues, ability to monitor retrieval and reject intrusions, and noise level during retrieval competitions.

As such, linguistic researchers often find differences in language learning processes between young language learners and mature or adult language learners. As shown in developmental studies, age had an impact on language performance and linguistic knowledge. Younger learners experience changes unfolding over months and years in their language-learning processes, while adults experience fewer psycholinguistic changes of their knowledge and capacities (Bion, Borovsky, & Fernald, 2013). As such, adult learners can focus on language processing and comprehension mechanisms unfolding over milliseconds. The age difference impacted language learning processes in line with other studies on the impact of age on word memory and learning.

For example, Rigler et al. (2015) investigated spoken word recognition at different ages to determine time-course development of spoken word recognition and its changes at older ages. They used Peabody Picture Vocabulary Test and Clinical Evaluation of Language Fundamentals in their assessment, tools also used by McMurray, Samelson, Lee, and Tomblin (2010) in their visual world paradigm study of first language. Rigler et al. (2015) found 9-year-old children slower in word memory activation but more competitive in competitor word memory as compared to 16-year-olds. However, participants of both age groups ultimately reached the same degree of word memory over time, indicating that, although word memory may be different across age groups, effective learning strategies can negate the differences and help learners reach proficiency.

Emotion. Ferré, Sánchez-Casas, and Fraga (2012) found second language acquisition became easier when it was linked to emotion. Even though this link is well established in first language learners, researchers assessing the same link between word learning and emotion in native and nonnative language learners yielded mixed results. Some researchers found differences between first and second language learning processes such that, since second language learning happens late in life time, it may not be affected by emotion, as emotion-language associations are established during childhood (Conrad, Recio, & Jacobs, 2011; Opitz & Degner, 2012). Other findings were that adult second language learners were affected by emotional features similar to first language learners (Ferré et al., 2012). Comparing first and second language learners, Ponari et al. (2015) found second language learners less efficient because their learning processes had not been linked to emotion, as first language learners' had during childhood. The authors believed second language learning efficiency can be linked to age, learning contexts, language dominance, proficiency, and similarity degrees between first and second languages (Ponari et al., 2015). However, they concluded highly proficient English speakers from typologically different first languages show the same facilitation in emotionally valanced words as native English speakers, regardless of first language, age of English acquisition, or frequency and context of English use.

Human emotions serve as expressions of discrete emotional meanings recognizable from facial and vocal expressions, gestures, body movements, and languages. As such, the differences in cultural expression and vocal emotion recognition may have impacted adult second language learners in their language proficiency (Dael, Goudbeek, & Scherer, 2013) Cultural variations mark such emotional associations in

language learning, more easily decoded when expressed by a person from the same culture as compared to someone from a foreign culture.

To confirm the advantage of vocally emotional association from the same culture on language learning process, Jiang et al. (2015) studied the impact of emotion on adult learners. They found emotion functioning in multiple learning processes, such as facial or vocal expression, gestures, and body movements. In this study, the authors used pseudoutterances to convey four basic emotions expressed as English and Hindi, which they presented to both English and Hindi learners (Jiang et al., 2015). Additionally, they included both first and second language learners to provide sufficient controls, and calculated an index to show the mean emotion identification point for each group to offer unbiased measures of accuracy, finding native learners recognized emotions faster with more accuracy, unaffected by different speeds of acoustic information. When learners were proficient in the second language, Jiang et al. (2015) predicted faster recognition of emotional expression in second language, with more accuracy. The importance of this study was its portrayal of nonverbal dialects as impeding both the efficiency and accuracy of vocal emotion processing across cultures, even when learners were highly proficient in their second language.

Memory strategies. As a brain function, memory categorization falls into at least two subfunctions, memory for association and memory for order. Memory for association is a way to memorize items as pairs, such as salt and pepper; memory for order is a way to memorize items as a list in which order matters, such as a telephone number. Most memory researchers studied these functions separately, but Caplan (2015) looked at both together to link association-memory and order-memory, even though they are distinct

functions. The author argued for the necessity of memory models combining both functions, because they may facilitate exploring different brain activities at the same time, which is promising (Caplan, 2015). The suggested combination models include a grouping of order of items within associations, such as the question "Is it William James or James William?" or an association judgment model of relative order, posed as "Who left the party earlier, Hermann or William?"

Exploring second language learning between Belgian and Chinese learners, Imbo and LeFevre (2011) investigated working memory strategies and language learning efficiency, and found the selection of working memory strategies varied between the two cultures. Although Chinese learners were faster and more accurate than Belgian learners in word memory, they tended to choose the memory strategies less adaptive or less estimable, especially so with a loaded working memory. The results indicated memory strategy selection impacted both word memory and language proficiency.

Trelle, Henson, and Simons (2015) compared the efficiencies between semantic processing and self-referential processing in adult learners of younger and older ages. They assessed two memory functions with a task involving retrieval of semantic knowledge, traditional binary self-referential and semantic encoding judgments, Trelle et al. (2015) found both semantic and self-referential retrievals resulted in enhancements to recall and recognize nouns relative to binary encoding judgements across both ages. However, younger learners boosted their memory following semantic retrieval, whereas older learners benefited from self-referential retrieval, subsequently eliminating age-related deficits in recognition memory (Trelle et al, 2015). Important indications of this study were that mnemonic benefits from self-referential processing vary depending on

encoding strategies, and self-referential and semantic processing can be equally effective in mitigating age-related deficits in vocabulary memory learning.

Self-directed learning is one of the important aspects in adult second language learning, assisting learners differently from the traditional teacher-directed learning. Guglielmino, Long, and Hiemstra (2004) defined self-directed learning as occurring when an individual assumed primary responsibility and external characteristics of an instructional process in learning experience. Since its 1975 definition by Knowles (as cited in Grover, Miller, Swearingen, & Wood, 2014) as an instructional strategy, self-directed learning proponents measured the roles of teachers in formal educational settings, considering different levels of self-direction from learners. Based on this theory, teachers' purpose became attempts to match the learner's stage of self-direction and prepare learners to advance to higher stages. As such, learners received progressively more control and choices in their learning situations. Grover et al. (2014) surveyed 400 ESL students who had been living in the United States for four to 20 years and found self-directed learning strategies used on a limited or infrequent basis. The authors suggested self-directed learning can serve as a viable instructional strategy for ESL learners to improve communication skills, progress independently, and enrich their daily lives.

Key Variable and Concepts

An essential and challenging part of this language learning research is the selection of measurement instruments (Records, Keller, Ainsworth, & Permana, 2012). Measurement tools were crucial to link validity to the analysis of the study. Empirical measures led to the theoretical connections between the study and the participants. The

procedures consisted of types of domain identification, incorporation of expert appraisal, and statistical methods. I assessed connections between the identified constructs, concepts, and different types of validity, as well as the best tool for reliability.

mini-Kingston Standardized Cognitive Assessment

The mini-Kingston Standardized Cognitive Assessment Revised (mini-KSCAr; Hopkins & Kilik, 2013) comprises just six tasks—Word Recall, Orientation, Delayed Recall, Word Recognition, Abstract Thinking, and Clock Drawing—rather than the 19 tasks of the full assessment and takes 7 to 10 min to administer. This broad-range test measures several cognitive abilities of memory, language, and visual-motor functions, returning an overall total score as well as a percentile score for each subtest, with scales confirming sensitivity, reliability, and validity (Hopkins, David, & Kilik, 2014). On a range from 0 to 125, a score below 105 indicates the presence of dementia and tests for memory According to Hopkins et al. (2014), " Some psychometric properties include an interrater reliability 0f 0.99 and a correlation of 0.80 with WAIS-III Verbal IQ" (p. 457).

Heinik and Kavé (2015) investigated the usefulness of the mini-KSCAr and compared it to categorizing individuals based on *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013) criteria. In addition to the KSCAr, the researchers used other measurement tools to determine the better fit. Their results indicated the mini-KSCAr is a better predictor of memory performance compared to the MMSE and CDT.

Wechsler Adult Intelligence Scale-Fourth Edition

Administered to individuals 16 to 90 years of age, Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV) measures general intelligence through several subtests

(Wechsler, 2008) consisting of Block Design, Digit Symbol-Copy, Visual Puzzles, Figure Weights, and Cancellation and Coding. WAIS-IV is based on a hierarchical nature of intellectual measurement. The assessment tool drew from standardization sample of participants related to language, uncorrected sensory impairments and communication limitations, and upper extremity impairment.

Paced Auditory Serial Addition Test

The Paced Auditory Serial Addition Test (PASAT) measures sustained attention (Scherer et al., 2007) and information processing speed. When administered, a subject is to add random single digits to a consecutive digit and to the one immediately before it. Digits arrive auditorily at a frequency of one digit every 3 sec or one digit every 2 sec. Calculation involves a combination of correct responses and number of omissions, with a maximum score of 60.

Peabody Picture Vocabulary Test III

Those assessed with the Peabody Picture Vocabulary Test III range from young toddlers to elderly individuals, with the examiner determining a starting point based on the individual's age. The subject must select a word either verbally or nonverbally when presented with four words that relate to one of the pictures. The individual's score determines a basal point: If the examinee provided enough correct answers, the examiners may choose to move to the next set of words. If a basal was not established, the examiner administers the exam backward until achieving an established basal point. The tests consist of 12 items and 17 sets, comprising 204 items (Pae, Greenberg, & Morris, 2012).

Summary and Conclusions

This chapter encompassed a review of the literature regarding adult second language learners and language acquisition, as well as a discussion of several vocabulary strategies. According to Saengpakdeejit (2014), individuals attained, stored, and retrieved vocabulary to gain new vocabulary. Cognitive strategies considered included those comparable to memory strategies due to the ability to process and manipulate information (Schmitt & Schmitt, 2014). Verbal and written review through repetition and mechanical means helped link word meaning to objects (Schmitt & Schmitt, 2014). Metacognition strategies assisted in planning and evaluating the way we acquire knowledge by enhancing learning and seeking the most effective way of learning (Lai, 2011). Social strategies by interactions with teachers, other learners, and native language speakers' social strategies relied upon interaction with teachers, learners, and native speakers to help develop vocabulary learning (Oxford, 2013). Teachers provided explanations and helped students develop language through activities to help close the education gap (Oxford, 2013). The concept of education started with what learners thought about an object; this is defined as an understanding of learning and how the process applied to reading, writing, listening, and vocabulary (Birjandi &Mohammadi, 2014).

This chapter included an exploration of memory models. Learning strategies such as the use of word lists, flash cards, oral and written verbal rehearsal, and mnemonics augment learning later placed in memory. Memorization through verbal repetition helped connect the meaning of a word and made connections to previous knowledge (Yu, 2011). Some criticized learning vocabulary from lists and flash cards because of the lack of communicative context (Kalajahi & Pourshahian, 2012). According to Yu (2011),

memorizing learning from oral and written verbal rehearsal in attention was a significant aspect of learning memory (as cited in Tavakoli & Germai, 2013). Memory serves as a vital part of cognitive language functioning for second language learners. The naturalistic decision model assessed decision-making when faced with uncertain factors such as time pressure, as well as complex and dynamic learning environments (Klinger et al., 1993). The lexical memory model applies to the learner's capability of memorizing meaning in a large volume (Nickerson, 2011). Researchers have adapted the recognition-primed decision-making model based on crossword skills by focusing on semantic and orthographic information (Mueller & Thanasuan, 2013). Language and memory learning for adult second-language learners ocused on language acquisition through phonological recognition (Gontijo et al., 2003). The focus of language acquisition to visual memory was on the close relationship between visual attention and visual working memory (Won & Jiang, 2015). During language acquisition, individuals used both phonological and visual memories based on the phonological and visual memories processed (Escudero et al., 2008; Ota et al., 2009). The factors that affected memory and language learners included age, emotion, and memory strategies. Second language learners' vocabulary learning is influenced by their age (Stipek & Valentino, 2015). Language acquisition became easier when linked to emotion (Conrad et al., 2011; Opitz & Degner, 2012). Chaplin (2015) categorized memory as at least two different functions that assisted in learning regarding memory of association and memory of order (Chaplin, 2015).

Based on the literature, I identified a gap in the area of teaching approaches for adult second language learners. The information available was by researchers focused on learning language phonetically; however, there was a lack of literature centered on

learning and teaching approaches for adult second language learners. Therefore, I focused this study on the exploration of second language and the ability of English second language learners to utlizing picture cards, words on cards, and words on cards with a picture to determine which technique is more efficient for the second language learner. In Chapter 3, I present a research design to implement this study.

Chapter 3: Research Method

My purpose in this study was to determine which method was easier and quicker to assist the second language learner to recall and acquire vocabulary. This chapter begins with a description of the research design and rationale, followed by an overview of the procedures for recruiting and obtaining participants, a summary of the study's instrumentation, a synopsis of how I collected and statistically analyzed the data, any identified threats to validity within the study, and an overview of the ethical procedures followed in this study.

Research Design and Rationale

I used a quantitative, quasi-experimental design to assess differences in word acquisition using two different teaching strategies. Because the research questions required analysis of quantified data to assess differences in the variables of interest, the quantitative, quasi-experimental design is appropriate for the study. The independent variables for the study were method of instruction (flash cards that contain words only or a combination of words and a picture) and length of time (15 min or 30 min). The independent variables served as the grouping method for participants in the study. The dependent variable was word acquisition, assessed as the number of words recalled and recognized on the KSCAr (Heinik & Kavé, 2015).

Adult language learners face unique challenges related to learning second languages. The rationale for my study was to investigate whether differences in the method of instruction pose a potential benefit to adult language learners. I collected quantitative data to numerically describe word acquisition in adult language learners and objectively assess differences in word acquisition that depend on type (flash cards) and

length of time (15 min or 30 min). Quantitative methodologies are appropriate when the researcher intends to measure relationships and differences in variables, rather than to broadly explore variables (Rawbone, 2015).

Quasi-experimental studies involve manipulation of the outcome variable without randomly assigning participants to groups (Campbell & Stanley, 1963). Within this quasi-experimental study, I manipulated the application of the treatment, which was congruent with the study's research questions. One group of participants viewed word-only flashcards, and the other group of participants saw flash cards that contained both words and a picture and by the length of time for learning—15 minutes compared with 30 minutes.

The nature and design of this study imposed several constraints related to time and resource availability. Because this study was cross-sectional in nature, I focused on word acquisition in participants at a single point in time; therefore, the timing of the intervention and assessment influenced participation and results. Considering the ongoing projects and work in which participants were engaged at the study site, some individuals were not willing to take part in the study. I conducted recurring data collection to increase access to participants and overcome any time constraints related to students' workload that may have decreased participation. The availability of resources was limited as this study was geared to adult second language learners. The resource material did not lend itself to the level of the second language acquired and was not suited to the education of the person, which impeded willingness to participate in the study.

Methodology

Population

The target population consisted of adult learners enrolled in an ESL course offered through the Education Service Center (ESC) in south Texas. The adult second language learners ranged from 18 to 40 years of age. The Education Service Center ESC is part of a system that includes 20 regional education service centers in the State of Texas, created by the 59th Texas Legislature (Region I, Education Service Center, n.d.) and later expanded to allow service centers to work with school districts. The objectives of the Education Service Center as specified in Texas Education Code TEC §8.002 are to "aid school districts in improving student performance in each region of the system, enable school districts to operate more efficiently and economically, and implement initiatives assigned by the legislature or commissioner" (Region I, Education Service Center, n.d.). Education Service Center is located in South Texas on the border with Mexico and provides services to school districts in multiple counties. This study focused on the Education Service Center area that covers South Texas, serving 37 school districts and 10 charter school systems in the seven-county area (ESC, 2016). The Education Service Center Adult Education Program provides opportunities for adult students to acquire basic skills they need to be productive workers, family members, and citizens.

The ESL courses took place in designated classrooms at different school district sites in South Texas. I randomly selected three of the Education Service sites to conduct the research. The enrollment at each site ranged from 20 to 35 students in the ESL courses, with a combined total number of 105 participants.

Sampling and Sampling Procedures

I used a convenience sampling approach to obtain participants. Convenience sampling provided each member of the target population an equal opportunity of being included in the study (Cascio, 2012). Within the target population, all students from the study sites who were enrolled in an ESL course had an opportunity to participate in the study.

I recruited participants from every ESL class offered through the three selected Education Service Center sites. I obtained permission to recruit participants from Education Service Center, which agreed to allow recruitment from the facilities and provided a classroom at each of the selected sites to conduct the study (see Appendix A for a copy of the permission). Instructors informed their students of the study and asked if they were interested in participating, next directing students who agreed to participate to a classroom that had been set aside for the study by the Education Service Center site. Upon my initial interaction with potential participants, I administered the informed consent. Participants who completed the informed consent received a randomly selected flash card, which contained either a star or moon and was either yellow or green. The shape on the card indicated the learning method for the participant, with recipients of a star flash card assigned to the words-only group and those with a moon flash card to the words-and-picture group. The color of the flash card indicated the time length students would have to review the words: yellow meant 15 minutes and green meant 30 minutes.

I used G*Power 3.1.9.2 to calculate the minimum sample size necessary for statistical validity and ran a 2x2 ANCOVA to address the research questions guiding this study. For a 2x2 ANCOVA with a medium effect size ($f = .25$), four groups, a power of

.80, and an alpha of .05, the minimum sample size necessary to determine statistical significance is 128 (Faul, Erdfelder, Buchner, & Lang, 2014). There were 32 participants in each of the four groups.

Procedures for Recruitment, Participation, and Data Collection

Following approval from Walden University IRB (01-04-18-0077614), I sent an email to the Education Service Center Adult Literacy Director requesting approval to recruit participants and conduct the study through three of their sites. I included a recruitment flyer, which the Education Service Center Adult Literacy Director distributed to instructors of adult second language learners at the three selected Education Service Center sites, requesting they print and distribute the flyer to students in each of their ESL courses. The recruitment email to the Director included six possible times, congruent with the ESL courses schedules, for me to visit the site to conduct the study and collect data. This allowed participants to select a time to participate in the study.

At the agreed-upon study/data collection day and time, I provided participants with a consent form describing the purpose of the study, the process of participation, the rights of the participant, the risks and benefits of participation, and the voluntary nature of participation (informed consent), which I distributed in a classroom reserved specifically to collect data. In Spanish and English, I verbally informed participants they could leave the study at any time without consequence. The consent form, available in both English and Spanish, assured participants there was no undue coercion to participate in the study. Participants were given time to review the form and sign if they agreed to participate in the study. Participants received a demographic questionnaire to complete, also written in both languages, on which they were to provide their age, gender, years of

education, and length of time they have lived in the United States. I assured participants any information they provided would remain confidential and no identifying information would be released to any source.

Participation

To assess participants' English word knowledge prior to the treatment, I asked students to complete a pretest consisting of Sections 6 and 14 of the KSCAr (Appendix D). This information was included in the statistical analysis to control for students' word acquisition prior to the intervention. Following their completion of the pretest, I transitioned participants to their study groups for their 15- or 30-min period to study the words. The study groups occupied different areas of the same room: at the front, in the back, and on either side. The participants received a timed 15-min or 30-min period to learn the cards for recall; depending on their group, they used flash cards with words only or with words and picture. The words on the cards were the same words printed on the KSCAr cognitive memory test. At the end of the allotted time (15 min or 30 min, respectively), participants received a 5-min break, after which they completed a posttest measure of language acquisition comprised of the same KSCAr subtests as the pretest. Upon return of their completed posttest to the researcher, participants exited the classroom.

Instrumentation

The primary instruments used in this study were a demographic questionnaire and the KSCAr (Heinik & Kavé, 2015). The KSCAr assessment is typically used to assess cognitive capabilities in individuals with dementia (Heinik & Kavé, 2015); however, it was relevant for use within this study because it contained several subtests that assess

word recall and recognition. The KSCAr is composed of 19 subtests that measure memory, visual-spatial processing, and language, and includes measures to determine the number of words acquired by the individual. Over approximately 30 min, participants completed Sections 6 and 14, which assessed word recall and word finding, respectively (Hopkins & Kilik, 2013). Section 6 required participants to respond to 10 pictures by providing the word that described the image in the picture. Participants received one point for every correct response and zero points for an incorrect response, to a maximum of 10 points. In Section 14 of the instrument, participants viewed a list of 20 words, after which I asked them to recall if words on a newly provided list of terms had been present on the list previously shown. Participants identified words as either "in" or "not in" the list of terms, with a total of 10 items in each category. Section 14 scoring was through tallying the number of correct responses in both categories (maximum of 20) and dividing the number by two. Because the total number of possible points for Sections 6 and 14 equaled 20 points, the value of the dependent variable for this study ranged from 0 to 20. I selected the KSCAr because it was well suited to the study purpose as well as financially feasible.

Initially, Hopkins et al. (2014) administered the KSCAr to a sample of individuals with and without dementia in an assisted living community, finding individuals without dementia performed better than those with dementia. The researchers calculated interrater reliability coefficients using Ebel's analysis of variance, with resultant correlations greater than 0.81 indicating good interrater reliability. In correlating the instrument using two scales of the Wechsler IQ assessment, the researchers received high scores (0.78 to 0.85), indicating good criterion validity (Hopkins et al., 2014). Finally, after conducting

discriminant analysis across the two groups (dementia and nondementia), they found 89% of cases from the total sample correctly classified (Hopkins et al., 2014).

Data Analysis

I used SPSS version 24 (IBM Corp., 2016) to enter data. The first step in data analysis was to assess for any possible violations of statistical assumptions. This involved using standardized values to screen the dataset for outliers, which indicated inaccuracy in data entry or tabulation of scores. Noted in data analysis were these outlying values and their potential to skew the final dataset. I then calculated *z* scores for the continuous variables under investigation, considering as outliers *z* scores exceeding 3.29 and removing them from the dataset (Tabachnick & Fidell, 2013).

Prior to conducting the 2x2 ANCOVA were assessments of analysis assumptions and data normality, the latter using a Q-Q plot. I assessed the equality of variances across groups using Levene's test, and then the assumption of linearity using a residual scatterplot. Ultimately, because each participant was assigned to a single group in the 2x2 factorial study design, the independence assumptions were unmet.

The questions guiding this study were as follows:

Whenan adult second learner is presented with two different methods of learning, will there be an increase in the number of words recalled?

RQ1: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning?

Null hypothesis: There is no statistical significance between two groups of adult second language learners' word acquisition recall, based upon method of learning.

Alternative hypothesis: There is a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning.

RQ2: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)?

Null hypothesis: There is no statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min).

Alternative hypothesis: There is a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min).

To address the research questions, I conducted a 2x2 factorial ANCOVA, assigning each participant to one of four groups: 15 min and flash cards with words only; 15 min and flash cards with words and picture; 30 min and flash cards with words only; and 30 min and flash cards with words and picture.

RQ1: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning?

RQ2: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning

(words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)?

The covariate in this analysis was participants' pretest scores on the KSCAr, and the dependent variable was the participants' posttest scores on the KSCAr. The ANCOVA tested the main effects of each categorical variable on the continuous dependent variable, while controlling for the effect of other continuous variables (Garson, 2009). Selection of covariates was based on their hypothesized effect on the dependent variable (Tabachnick & Fidell, 2013). In a pretest/posttest design, it was necessary to partial out the effects of the covariates to determine if the influence of each IV on the DV was due solely to the IV, or if the covariate influenced that relationship (Urdan, 2011). The results from the ANCOVA allowed for a statistical analysis of both research questions.

Threats to Validity

Validity refers to the factors influencing how well an assessment measures what it is intended to measure (Moskal & Leydens, 2000). Threats to validity may be due to external or internal factors (Salant & Dillman, 1994). Specific facets of the study that may threaten its validity are delineated here.

External validity referrs to the transferability of the study's findings to other locations and samples (Creswell, 2009) threats to external validity may occur if the independent variables significantly vary from each other and diminish the ability to assess the relationships of interest; this may ultimately introduce bias in the study. To decrease this threat, I utilized quantitative measures intended to reduce bias in measurement (Creswell, 2009). Additionally, recruiting a sufficiently large sample size

with a diverse sample of participants increased generalizability of the results to other populations of Spanish-speaking adult language learners. To attain this goal, participant recruitment was across all centers in the local area. It may not influence the generalizability of the results to other groups of adult second language learners who speak other languages, or to adult language learners in areas outside of those served by the Education Service Center.

Internal validity refers to the credibility of the findings and the fidelity of findings to participants' realities (Miles & Huberman, 1994). Specifically, within quantitative research, internal validity is assured when results are solely attributed to the variables included in the study (Onwuegbuzie, 2000). With regard to this study, timing may have decreased validity. I attempted to conduct the study in a manner sensitive to the timing of instruction and assessment at the Education Service Center to prevent intrusions on participants' learning. Doing so required working with the Education Service Center Adult Literacy Director and establishing times to visit that avoided any major assessments, projects, or other activities that may have decreased participants' ability to participate in the study. This was important to ensure participants did not rush through the intervention and assessments, thereby decreasing the accuracy of their results. Participants received encouragement to take their time on the KSCAr so as to provide accurate responses. The instrument took approximately 30 min to complete. There were, however, several challenges during this process. The main purpose of the Education Service Center course for adult second learners is to teach students the English language. It follows that a motivated ESL student may be intrinsically motivated to earn a higher

KSCAr score than a less-motivated student, thus introducing a source of bias in the study. Controlling for the pretest score helped control for this bias.

Ethical Procedures

I secured the approval of Walden University IRB 01-04-18-0077614 prior to conducting the study in consideration to the rights, welfare, and dignity of the participants. Next, I obtained approval from the Education Service Center to conduct the study with adult language learners at the Centers (Appendix C). Prior to participating in the study, volunteers completed an informed consent form outlining the purpose and nature of the study, process of data collection, and requirements for inclusion in the study. Participants were aware their participation in the study was completely voluntary, they would experience no undue coercion to participate, and they could leave the study at any time without fear of negative consequence. There was no compensation to participate to avoid introducing any financial coercion. Before taking part in the study, participants understood to signal the researcher by raising their hand should they have any concerns; in such cases, participants received a private consultation to address concerns, followed by a reminder of the voluntary nature of their participation and their ability to withdraw at any time should they have additional concerns.

I collected no identifying information and maintained sole access to information during data collection to ensure participants' privacy. Reporting of results in aggregate ensured information linked to individual participants would not be revealed. Participants were permitted to inquire about the study after their completion to help eliminate any mistaken beliefs or worries about their role. This study was not based on deception and there was no predictable harm to participants, with attempts made to block any harm to

the participants. Participants received a list of local services and phone numbers, as well as the researcher's phone number to address any concerns about the study or their participatory role. I collected all paper copies of any study-related materials from participants, storing these documents, along with electronic copies of participant data secured on an encrypted thumb drive, in a locked file cabinet in my home office. These materials will remain for five years following the close of the study, after which time I will destroy them.

Summary

This chapter included a description of the research design and rationale, as well as an overview of the procedures for recruiting and obtaining sample participants, procedural steps, administration procedures, and collecting and storing data. Also included was a detailed and systematic overview of the research methods used in this research to study vocabulary acquisition among adult second language learners.

Chapter 4: Results

My purpose in this study was to determine which method was easier and quicker to assist second language learners in recalling and acquiring vocabulary. The current study centered on the acquisition of English language vocabulary through recall, comparing two ways of presenting new vocabulary through cards: words on cards and word on cards with a picture. The independent variables for the study were the approach of instruction and length of time for learning; the dependent variable was the number of words learned.

This chapter includes the results of the procedures and analyses described in Chapter 3. It begins with a description of the data management procedures, followed by a description of the sample characteristics. Finally, I provide the statistical results of this study, organized by research question.

Data Collection

The dataset originally consisted of 100 participants; the final dataset consisting of 95 participants, with five participants excluded from the analyses, four due to missing data and one due to identification as an extreme outlier. To identify any exclusions, I first assessed the dataset for cases with missing data, and then removed four participants who did not identify the length of time for learning (30 min or 15 min) and method of learning (cards with words only or cards with words and a picture). Next, I identified outliers on the continuous variables of interest using standardized values, or *z* scores, identifying standardized values greater than 3.29 units away from the sample mean as outliers in the dataset (Tabachnick & Fidell, 2013). Also excluded from the final dataset was an extremely low outlier on the posttest score (the participant provided a value of “0”).

Description of the Sample

Table 1 lists the frequencies and percentages for the categorical variables. All 95 participants attended school in their home country as follows: primaria (Grades 1 to 6), secundaria (Grades 7 to 9), and preparatoria (Grades 10 to 12). A large majority (93.68%) of participants had also attended a school in the United States. Although participants indicated the highest grade they had attended, their responses did not specify successful completion of that grade. Participants' educational achievement varied, but the majority of them (51.58%) had attended school up to Grade 12. Most participants (69.47%) were married, with an average age of 41.27 (*SD* = 10.58) years. More than half (51) of the participants were in the words-only group, with 44 in the words-and-picture group. In addition, there were 49 participants in the 15-minute learning group and 46 participants in the 30-minute learning group.

Table 1

Frequency Table for Categorical Variables

Variable	*n*	*%*
Attended school		
Yes	95	100.00
No	0	0.00
Attended U.S. school		
Yes	6	6.32
No	89	93.68
Level of schooling		
Elementary	2	2.11
Grade 6	6	6.32
Grade 7	1	1.05
Grade 8	1	1.05
Grade 9	3	3.16
Junior high	1	1.05
Grade 11	1	1.05
Grade 12	49	51.58
College	31	32.63
Marital status		
Divorced	7	7.37
Married	66	69.47
Other	2	2.11
Single	20	21.05
Method of learning		
Words and pictures	44	46.32
Words only	51	53.68
Length of time for learning		
15 min	49	51.58
30 min	46	48.42
Groups		
Words only, 30 min	32	33.70
Words with pictures, 30 min	17	17.90
Words only, 15 min	19	20.00
Words with picture, 15 min	27	28.40

The pretest consisted of Sections 6 and 14 of the KSCAr. For Section 6, the participant viewed a picture and asked to name the picture, receiving one point for each correct answer. In Section 14, the participant viewed a word without a picture and asked to read the word on the card, again receiving one point for each correct answer. Procedures for the pretest and the posttest were identical those outlined in the Chapter 3.

Table 2 presents the means and standard deviations of the continuous variables, calculated for all participants' scores on the KSCAr across all groups. Overall, participants had an average pretest KSCAr score of 5.92 (*SD* = 1.61) and an average posttest KSCAr score of 9.32 (*SD* = 1.11). Across the sample, participants learned an average of 3.37 words (*SD* = 1.70).

Table 2

Means and Standard Deviations for Continuous Variables

Variable	Min	Max	*M*	*SD*
Age	24.00	78.00	41.27	10.58
Pretest KSCAr score	2.00	10.00	5.92	1.61
Posttest KSCAr score	6.00	10.00	9.32	1.11
Number of words learned	0.00	6.00	3.38	1.70

Hypotheses Testing

To test the research question and hypotheses, I conducted a 2x2 ANCOVA with a dependent variable of posttest KSCAr scores and independent variables of method of learning and length of time for learning. The covariate was pretest KSCAr scores. The research questions guiding this study were:

RQ1: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning?

RQ2: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)?

Prior to the analysis, I assessed the assumptions of an ANCOVA analysis, the first being the assumption of normality using a Q-Q plot. In this study, the Q-Q plot showed deviation from normality (Figure 1). I also calculated skewness and kurtosis statistics to confirm the shape of the distribution. When the absolute value of the skewness is less than 2.00 and the absolute value of the kurtosis is less than 3.00, the distribution of data can be considered normally distributed (Westfall & Henning, 2013). Skewness and kurtosis values for each of the posttest KSCAr values fell within the acceptable range (Table 3). Next, I used Levene's test to assess the assumption of equality of variances among the data. Levene's test was not significant ($p = 0.61$), indicating the assumption of equal variances was met. A scatterplot of the residuals to assess linearity revealed no curvilinear trends, indicating that the assumption of linearity was met (Figure 2).

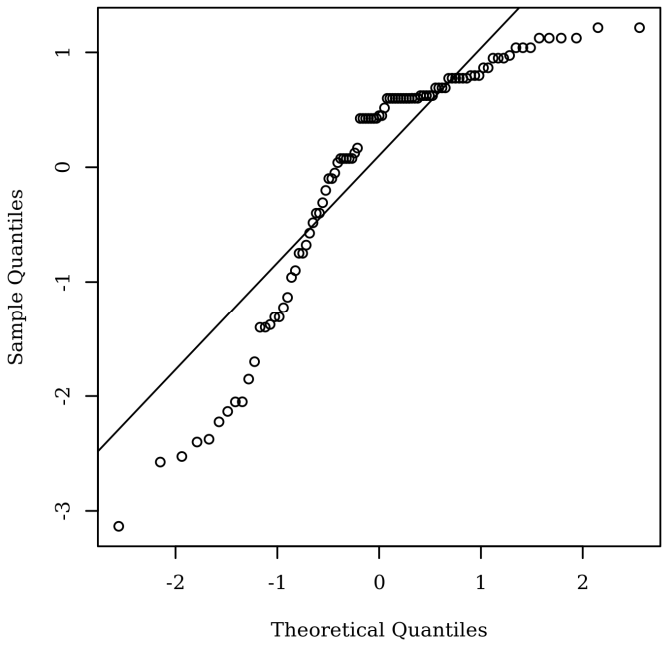

Figure 1. Q-Q scatterplot for the ANCOVA.

Table 3

Skew and Kurtosis Values of Posttest KSCAr Score

Variable	Skewness	Kurtosis
Method of learning		
Word and pictures	-1.61	0.96
Words only	-1.30	0.60
Length of time for learning		
15 min	-1.58	1.21
30 min	-1.30	0.44

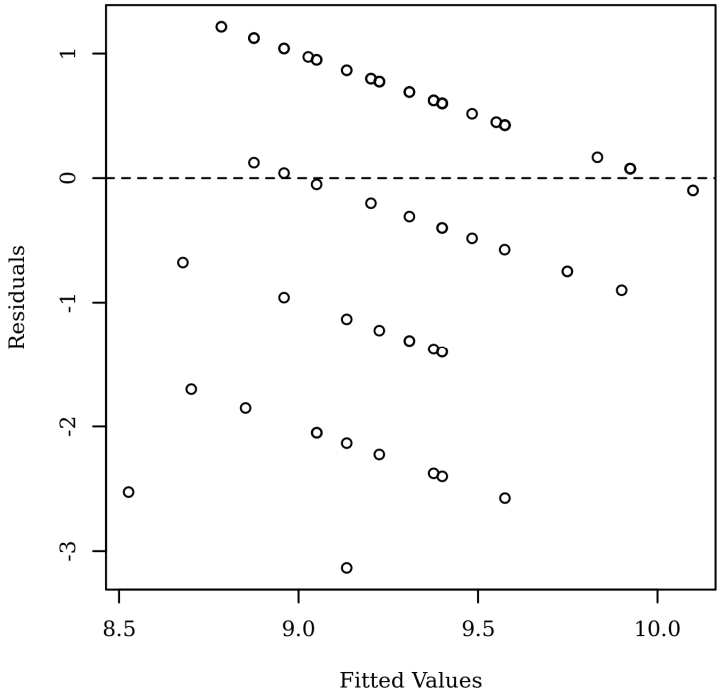

Figure 2. Residuals scatterplot for the ANCOVA.

The statistical results assessing the main effect addressing method of learning were not significant—$F(1,90) = 1.66$, $p = .20$—indicating no significant between-group differences in posttest KSCAr scores for methods of learning after controlling for pretest KSCAr scores. As such, the null hypothesis for Research Question 1 cannot be rejected.

The statistical results assessing the main effect addressing length of time for learning were similarly not significant—$F(1,90) = 0.06$, $p = .82$—indicating no significant differences in posttest KSCAr scores between the two groups' lengths of time for learning, after controlling for pretest KSCAr scores. Additionally, there was not a statistically significant interaction effect between the two independent variables—$F(1, 90) = 0.40$, $p = .53$—indicating the effects of one independent variable did not depend on the values of the other independent variable. As such, the null hypothesis for Research

Question 2 cannot be rejected. Table 4 presents the full results of this statistical analysis; Table 5 presents the marginal means for each group.

Table 4

ANCOVA Table for KSCAr Score by Method and Length of Time for Learning

Term	*SS*	*df*	*F*	*p*	$\eta_p 2$
Method of learning	1.97	1	1.66	.20	0.02
Length of time for learning	0.07	1	0.06	.82	0.00
Pretest KSCAr score	7.25	1	6.10	.02	0.06
Method of learning x length of time for learning	0.48	1	0.40	.53	0.00
Residuals	106.97	90			

Table 5

Descriptive Statistics for ANCOVA for KSCAr by Method and Length of Time for Learning

Combination	Marginal Means	*SE*	*n*
Word and pictures: 15 min	9.56	0.21	27
Words only: 15 min	9.12	0.23	22
Word and pictures: 30 min	9.36	0.27	17
Words only: 30 min	9.21	0.20	29

Summary

This study had two questions.

Research Question 1: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based on the method of learning?

After assessing for Research Question 1, I found the main effect of the method was not significant, which shows the null hypothesis cannot be rejected.

Research Question 2: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)?

The statistical results were not significant, indicating there was not a difference in the participants' posttest KSCAr scores based on the time of learning (15 min vs. 30 min). As such, the null hypothesis for Research Question 2 cannot be rejected.

Although participants' KSCAr scores appeared to increase from the pretest to the posttest, there were no statistically significant differences in posttest scores based on method of learning, length of time for learning, or the interaction between the two. As such, the null hypotheses of Research Questions 1 and 2 cannot be rejected.

Chapter 5 incorporates a discussion of these results within the context of the relevant literature, as well as a discussion of the strengths and weaknesses of the study. I also provide directions for future research.

Chapter 5: Discussion, Implications, and Recommendations

The first research question asked in this study was: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based on the method of learning? The null hypothesis was there is no statistical significance between two groups of adult second language learners' word acquisition recall, based upon the method of learning. The alternative hypothesis was there was a statistically significant difference between two groups of adults second language learners' word acquisition recall, based upon the method of learning.

The second research question in the study was: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)? The null hypothesis stated that there is no statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon the method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min). The alternative hypothesis states that there was a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon the method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min). The study used 15 minutes and 30-minute time frame to learn new vocabulary based on the researcher's educational experience as an ESL teacher. The participants were given a 5-minute break after implementing this study's treatment and before completing the posttest. The break was not extended longer than the 5 minutes for fear of the participants not returning to

complete the posttest. The problem that I addressed in this study was that some adults in the United States do not speak the dominant English language. This lack of skill in the predominant language results in a number of challenges for these people, including that it is difficult for them to find employment. Without the ability to speak English, these individuals may seek employment and not find a job, which can cause an economic drain to their families and their community. Furthermore, these individuals are also less able to help their children with their schoolwork. These experiences may start a cycle in which their children also struggle to obtain employment because of their parents' inability to speak English, which, in turn, affects the children's ability to succeed at their schoolwork. If the children fail to succeed at their schoolwork due to language difficulties, their academic careers may be hindered, which may have a negative effect on their ability to secure future employment. The purpose of this study was to determine which method was easier and quicker to assist the second language learner to recall and acquire vocabulary.

In this quantitative study, I examined the relationship between the acquisition and recall of English language vocabulary in order to assist second language learners. The study used words on cards and words on cards with a picture. This chapter provides an overview of the findings as they pertain to the preexisting literature presented in Chapter 2, as well as a discussion of the implications of these findings within the context of the larger body of knowledge, the applicability to the real world, and the theoretical framework. The chapter will also include an overview of the limitations present in the study, and recommendations for both further research and practice.

Interpretation of the Findings

This study included two research questions:

RQ1: Is there a statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning?

RQ2: Is there a statistically significant difference between two groups of adult second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min)?

The statistical results of the study indicated the main effect of method of learning was not significant, $F(1,90) = 1.66$, $p = .202$, which means there were no statistically significant differences in posttest KSCAr scores between methods of learning after controlling for pretest KSCAr scores. Therefore, the null hypothesis for Research Question 1 cannot be rejected. While there were no statistical differences with this finding, there is still the potential for practical applications to come from the results of RQ1. For example, students' self-efficacy may have improved despite the lack of statistically significant findings. This improved self-efficacy with language acquisition may result in overall second language acquisition, which has the potentially to positively benefit English language learners' job-seeking prospects. Specifically, these practical applications from the method of learning may include being more confident in applying for a job, having the ability to add a better understanding of the English language, as well as being able to use words that may help the individual have a better chance of procuring a job.

As for Research Question 2, there was not a significant interaction effect between the two independent variables—$F(1, 90) = 0.40$, $p = .528$—which signifies the effects of one independent variable do not depend on the values of the other independent variable. Therefore, the null hypothesis for Research Question 2 cannot be rejected. Findings indicated that participant KSCAr scores did appear to increase from the pre- to the posttest. However, there were no statistically significant differences in posttest scores based on method of learning, length of time for learning, or the interaction between the two. Collectively, the null hypotheses of Research Questions 1 and 2 cannot be rejected.

The study's findings contrasted with the previous findings of naturalistic decision making model founded by Klein and Klinger in 1991 (Klinger, Andriole, Militello, Adelman, & Klein, 1993), which explored learner decision making in learning when they faced challenges like uncertainty, time pressure, and complex and dynamic learning environmental conditions. In these previous studies, researchers determined the naturalistic decision model was beneficial in assisting second language learners. The naturalistic decision model included five approaches that used tactical decision games to help individuals become better decision-makers by using short paper-and-pencil scenarios to describe a situation and any resources available, and then introducing an unforeseen and challenging twist requiring a rapid decision (Klein, 2015). These decision games included teaching a doctrine representing best practices to reduce the chances of a coordination breakdown, teaching structural relations based on a collecting scenarios, relying on actual workplace experiences to provide on-the-job learning activities with the potential to boost tacit knowledge, and using a scenario-based method akin to tactical decision games to have learners address decisions in the midst of scenarios presented in

paper-and-pencil format. The purpose of the naturalistic decision model was to provide a perspective on the topic of improving instinctual decision-making (Klein, 2015). While participants within the current study did not voice uncertainty or time pressure, and the study was not held in a complex dynamic learning condition, there may have been some potential for them experiencing these factors and choosing not to report them.

In addition, Nickerson (2011) and Tomo et al. (2014) focused on the lexical memory model, which involves learners' capability to memorize vocabulary and store it in their long-term memory. While the current study addressed memory, I focused neither on long-term memory nor the lexical memory model. The results of the study are similar to those of the Recognition Primed model, which adopted the Bayesian Recognition Model. The Recognition Primed model functions with the semantic and orthographic routes to access lexical memory and retrieval simultaneously. Furthermore, semantic and orthographic routes can assist individuals in gaining the ability to read, write, and speak with increased fluency. As such, participants within the current study used memory to assist with their second language acquisition. Because the Recognition Primed model implements both semantic and orthographic routes to language acquisition, there is the potential that students within the current study may have increased fluency in their second language acquisition as compared with other models currently used for English language learners, such as the lexical memory model. Through the use of Recognition Primed, students in the current study may have improved chances of seeking employment and assimilating due to the increased effectiveness of the aforementioned model.

Similar to Griffiths and Oxford's (2014) research, I focused the current study on the use of memory, cognitive, metacognitive, and learning beliefs through different ways

of learning. The strategy that best relates to the study and the study outcomes is the strategy of memorizing learning from word lists and flash cards. Griffiths and Oxford (2014) specifically focused on the cognitive view of learning, the emphasis of which is teaching the individual the learning strategy in which their learning can be applied in different situations. As such, the use of cognitive learning strategies has the potential to benefit learners if they come across a word they do not know. Furthermore, cognitive learning allows participants to relate unknown words to their primary language. This is accomplished by participants referencing their past academic experience to verbalize the unknown word, thereby utilizing long-term memory to do so. In the course of the current study, participants might have previously learned unknown words when helping their own children with homework or while acquiring vocabulary during their adult second language courses. I cannot make this determination, though, as I found no statistical effect regarding the cognitive capabilities of study participants. This provides a potential area for further research, conducting a follow-up study with these participants to determine if such cognitive interventions were useful to them during the course of acquiring a second language.

Focusing on cognitive strategies reveals a similarity between cognitive strategies and memory strategies, as cognitive strategies involve both spoken and written repetition. As such, memory, particularly rote memorization, is heavily constituted by repetition. Within this study, repetition was key, as participants were given time to study the words and review them several times. Although participants did not use any written repetition, some repeated this process so as to remember and learn the words on cards and words on cards with pictures. This strategy helped some participants acquire some or most of the

words. While Griffiths and Oxford (2014) focused on a combination of both cognitive and metacognitive learning strategies, I relied far more on cognitive learning for the current study's results. This is partly because metacognitive strategies include a conscious overview of learning process and the associated decision-making regarding planning, evaluation, and monitoring ways to learn. While this was successful for Griffiths and Oxford (2014), the current study was short, which did not allow participants much decision time about planning, evaluating, or monitoring the way they learn. Had the current study incorporated more time, metacognitive strategy utilization may have resulted in statistical significance for the findings, along with greater clarity regarding the use of vocabulary. However, this was not the case, guaranteeing that assertion of potential findings had circumstances been different are rooted in assumption.

Another method of learning examined by both Griffiths and Oxford (2014) and the current study included learning belief strategies. Learning belief strategies are stronger than rote memory, even though many regard rote memory as the best for review before exams or under pressure (Birjandi & Mohammadi, 2014). This was evident in the current study, since participants wanted to learn all the words given to them before the end of the study.

Furthermore, one key facet in previous research was memorizing learning using mnemonics (Zahedi & Abdi, 2012). Mnemonics involves using cognitive functions to promote word learning throughout retention and retrieval, including visual, verbal, or mixed strategies (Tavokoli & Genomi, 2013). The participants of the current study did not use mnemonics in the forms of letters because words on cards were provided to them; they were also not asked to use mnemonics. However, participants did review the words

visually and verbally. Finally, the last key facet of learning beliefs strategy was language acquisition through phonological memory. This includes language acquisition through phonological recognition such as a sound of a grapheme, defined as a letter combination of letters (Gontijo et al., 2003). Participants in the current study did not use this strategy, instead relying more on visual memory and verbal rehearsal to acquire the new words.

Limitations

The first limitation of the study was that the results do not allow for generalizability, trustworthiness, or reliability; this is due to several factors that may have influenced the results.The first is the length of time a second language learner has lived in the United States, as this may make a difference due to the age of the individual. The individual may have learned language through other means, such as conversation with others or their own children, or when they had to make themselves be understood. The second factor is the amount of English language the second language learner has acquired while in the United States; an individual living in the United States may only acquire a few words due to others around them conversing with them in their native language. Third is the cognitive ability of a second language learner, because it is difficult to identify the presence of any underlying learning problems that affect the individual, be they a native English speaker or a non-English speaker. The fourth factor is the socioeconomic status (SES) of the individual, as individuals with higher SES may have the means to hire a tutor to learn a second language. Conversely, individuals with low SES may not have the means to do so, thereby limiting their ability to receive outside assistance. The fifth factor is the amount of time the participants had to review vocabulary words, as individuals may need additional time than what was provided

during the study. Finally, the last factor is the level of education the second language learner has received in the United States or Mexico. There is no way to determine the level of education an individual received prior to participating in the current study. As such, some participants may have had college degree while others only had a sixth-grade education. These individuals may or may not have a sound foundation in academics in the United States or Mexico, as their instructors may not have been trained in teaching second language learners. Additionally, participants have difficulty in learning new information. These findings are important because they provide information about adult second learners and the way of acquiring language by learning a few words at a time. With this limited number of words, the individual has time to practice the pronunciation of the word, use it a few times, practice it in different settings, and gain confidence with the new language. The participants may gain a sense of self-efficacy after the study due to increase knowledge of words.

Recommendations

In establishing the recommendations based on the findings of the current study, I used two categories to apply suggestions for further research and recommendations for practice. One recommendation is that future researchers set up the analysis so that results can be generalized to other languages, not just English. The results of this study indicated both strengths and weaknesses. The potential impact for positive social change is the approach to teaching adult second language learners.

Another recommendation is to incorporate memory techniques to aid in learning a new language based on different time allotments and teaching methods. Additionally, adult language learners can develop a more extensive second language word bank that

might lead to a fluent second language user. I employed a quantitative and quasi-experimental design to assess the difference between two teaching strategies and the theoretical framework based on the exemplar model. As indicated in Chapter 1, the exemplar model grew out of the theoretical framework of Kahneman and Tverksky's (1973) exemplar model of prediction and organization. In this study, one group of participants learned words on cards for 15 min, while another group learned words on cards for 30 min. As these groups learned words on cards for either 15 min or 30 min, the other groups learned words on cards with pictures for 15 min and 30 min. The results of the study indicated no significant differences in the method of learning or the time spent learning words on cards and words on cards with pictures.

Because of these findings, future researchers will likely benefit from the use of a different research method. An example would be for the participant to be able to recognize the word in the context of a sentence or explain the meaning of the word. A second recommendation is to have the participants apply the word in different contexts or settings, or to label specific objects using the words. Furthermore, another recommendation is to have participants spend longer than 30 min reviewing the words. These recommendations have the potential to influence the outcomes of a similar study.

Additional suggestions for future researchers include separating the participants by number of years spent in school, as some had more schooling than others. Also, in their years of study, some had to learn material in English. Still, other participants may have started learning English in their home country or at a younger age, perhaps at a kindergarten or first-grade level as opposed to when they entered a school in the United

States. It is recommended to divide participants into the different grade levels, as this will give a better understanding of when they began to learn the English language.

Implications

The findings of the current study are important in that they relate to Kahneman and Tversky's (1973) exemplar model of prediction and categorization. This approach helps to illuminate the ways people can predict and make judgments by using the information they already have to make predictions when acquiring new knowledge. As such, the participants of this study may have already acquired the words before they participated in the study, through past experiences from their own country, or through television, radio, or advertisements in their native country. In addition, participants may have learned words from their children who attend U.S. schools and bring schoolwork home. Adult second language learns who are parents might also learn the meanings of English words expressed in communications between children, their siblings, and other family members who speak English. Participants may have learned some of the presented words in their home country or related words that are similar in spelling and sound to those of their first language. Furthermore, they might have acquired additional words through other social media outlets.

Summary

There was a dearth of research related to learning and teaching approaches for adult second language learners, particularly those who are primarily Spanish speakers learning English through vocabulary recall. Therefore, I sought to determine which method was easier and quicker for second language learners in acquiring and recalling vocabulary: vocabulary cards with words or vocabulary cards with pictures. Findings

revealed no statistically significant difference between two groups of adult second language learners' word acquisition recall, based upon method of learning. In addition, there was no statistically significant difference between two groups of adults second language learners in word acquisition recall, based upon method of learning (words on cards and words on cards with pictures) and length of time for learning (15 min and 30 min). Additionally, the sample size decreased to 95 due to 5 individuals dropping out of the study. In this chapter, I provided recommendations for future researchers to determine if the potential for the alternative hypotheses exists, with some modifications to the overall study design.

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Appendix A: Consent

Consent Form

You are invited to take part in a research study on acquiring word after trying to different types of learning strategies to determine which method is more effective for learning and committing words to memory. Your participation is strictly voluntary, and the only requirements are that you are an Adult Second Language Learning, female or male between the ages of 18 to 40 years and whose first language is Spanish. This study is being completed by Maria Esmeralda Garza as partial fulfillment of the doctoral program at Walden University. If you have any questions at any time during the study, please ask Maria Esmeralda Garza.

This research poses minimum risk to the participant. There are slight advantages beyond the possibility of learning new words. However, the results of the study may have a positive impact by satisfying in the gaps to the existing research, while providing treatments and strategies necessary to treat Adult Second Learners, Learning Strategies, and Memory.

If you agree to participate in this study, you will be asked to complete a demographics form and will view words on cards and pictures with words on cards. This study should take from approximately 30 min to complete and forms at the beginning and end of the study will be returned to Maria Esmeralda Garza.

All records, documents, and any identifying information will be kept confidential and will be locked in a secure place at all times. If information based on this study will be used for further study, no identifying information will be released. The results of this study are to be utilized in gaining more understanding of the more efficient method of

learning a language and committing words to memory. There is no reimbursement for this study regarding earning extra credit or for monetary payment. You may leave the study at any time as this is voluntary.

If you have any questions about the procedures or aspects of this study, you may contact Maria Esmeralda Garza at garzalpc_s@yahoo.com or 956-994-3880. Dr. Michael Johnson is the committee chair for this study and can be reached by email at michael.johnson2@mail.waldenu.

Printed Name of Participant _____

Date of consent _____

Participant's Signature _____

Researcher's Signature _____

Consentimiento

Están invitados a participar en un estudio de investigación en la adquisición de palabra después de intentar diferentes tipos de estrategias para determinar qué método es más eficaz para el aprendizaje y compromiso palabras de memoria de aprendizaje. Su participación es estrictamente voluntaria, y los únicos requisitos son que usted es un adulto segundo aprendizaje de idiomas, femenino o masculino entre las edades de 18 a 40 años y cuyo primer idioma es el español. Este estudio se completa por Maria Esmeralda Garza como cumplimiento parcial el programa de doctorado en la Universidad de Walden. Si tienes dudas en cualquier momento durante el estudio, consulte a Maria Esmeralda Garza.

Esta investigación plantea un riesgo mínimo para el participante. Hay ligeras ventajas más allá de la posibilidad de aprender nuevas palabras. Sin embargo, los resultados del estudio pueden tener un impacto positivo por satisfacer los vacíos en la investigación existente, mientras que proporciona tratamientos y estrategias necesarias para tratar a los estudiantes adultos de la segunda, estrategias de aprendizaje y memoria.

Si acepta participar en este estudio, se le pedirá que rellene un formulario demográfico y verá las palabras en las tarjetas y las imágenes con las palabras en las tarjetas. Este estudio debe tomar de aproximadamente 30 minutos para completar y los formularios al principio y al final del estudio serán devueltos a María Esmeralda Garza.

Todos los registros, documentos y cualquier información de identificación se mantendrá confidenciales y serán bloqueados en un lugar seguro en todo momento. Si información en base a este estudio se utilizará para continuar los estudios, se publicará ninguna información de identificación. Los resultados de este estudio son para ser

utilizados en obtener más comprensión del método más eficiente de aprender un idioma y cometer palabras a la memoria. No hay ningún reembolso para este estudio en cuanto a ganar crédito extra o pago monetario. Usted puede dejar el estudio en cualquier momento ya que es voluntario.

Si usted tiene alguna pregunta sobre los procedimientos o aspectos de este estudio, puede contactar a Maria Esmeralda Garza al garzalpc s@yahoo.com o 956-994-3880. Dr. Michael Johnson es el Presidente del Comité para este estudio y se puede llegar por correo electrónico a michael.johnson2@mail.waldenu.

Nombre del participante impreso _____

Fecha de consentimiento _____

Firma del Participante _____

Firma del investigador _____

Appendix B: Demographics Questionnaire

Demographics Questionnaire

Completion of this questionnaire is very important in determining the results of this study. All records will be kept strictly confidential, and any reports that may be published will contain no names or identifying information on any participants on this study.

Please complete the following questions:

Age: _____

Marital Status

(1) Single _____

(2) Married _____

(3) Divorced _____

(4) Other _____

Education Level (Check the highest level that fits you)

(1) Elementary _____

(2) Junior High _____

(3) High School _____

(4) College _____

Education Level (Check the highest level that fits you)

(1) Elementary _____

(2) Junior High _____

Attended school in the United States:

(1) _____ I did attend school in the United States.

(2) _____ I did not attend school in the United States.

If you attended school in the United States, indicated the last grade attended:

(1) 1 _____

(2) Grade 2 _____

(3) Grade 3 _____

(4) Grade 4 _____

(5) Grade 5 _____

(6) Grade 6 _____

(7) Grade 7 _____

(8) Grade 8 _____

(9) Grade 9 _____

(10) Grade 10 _____

(11) Grade 11 _____

(12) Grade 12 _____

Cuestionario Demográfico

La realización de este cuestionario es muy importante para determinar los resultados de este estudio. Todos los registros se mantendrán estrictamente confidenciales y cualquier informe que pueda publicarse no contendrá nombres ni información de identificación de ningún participante en este estudio.

Por favor complete las siguientes preguntas.

Años: _____

Estado Civil

(1) Soltero _____

(2) Casado _____

(3) Divorciado _____

(4) Otros _____

Nivel Educativo (Compruebe el nivel más alto que le convenga)

(1) Primaria _____

(2) Secundaria _____

(3) Colegio _____

Asistió a la escuela en los Estados Unidos:

(1) _____ Yo asistí a la escuela en los Estados Unidos.

(2) _____ No asistí a la escuela en los Estados Unidos.

Si usted asistió a la escuela en los Estados Unidos, indicó el último grado asistido.

Appendix C: Letter of Cooperation

Region One Education Service Center

Cornelio Gonzalez, Ph.D., Executive Director

12/4/2017

Dear Maria E. Garza,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Second Language Recall within the Region I Education Service Center (ESC) Adult Education Program. As part of this study, I authorize you to visit selected program sites which offer English as a Second Language classes. A schedule will be created by the instructor and the researcher. The researcher will visit the site at the scheduled times. The target population consists of adult learners enrolled in an English as a Second Language course offered through the Education Adult Education Program in South Texas.

Participants will complete an Informed Consent Form prior to participating in the study. This form will outline the purpose and nature of the study, the process of data collection, and the requirements for inclusion in the study. Participants will be informed that participation in the study is completely voluntary and that there is no undue coercion to participate in the study. Participants will also be informed that they may leave the study at any time without fear of any negative consequence. The researcher will not offer compensation to participate in the study to avoid introducing any financial coercion to participate. Students will check yes to indicate their willingness to participate in study.

No personal identifying information will be collected from participants and the researcher will maintain sole access to the data during data collection to ensure participants' privacy. Results will be reported in aggregate to ensure that information linked to individual participants is not revealed. Participants will be permitted to inquire about the study after they have completed their participatory role to help eliminate any mistaken beliefs or worries about the study. This study is not based on deception and there is no predictable harm to come to the participants of this study. A list of local services and telephone numbers will be provided to the participants as well as the researcher's telephone number to address any concerns about the study or participatory role. The researcher will collect all paper copies of any study related materials from participants and will keep these documents in a locked file cabinet in a home office. The researcher will store electronic copies of participant data to an encrypted thumb drive. The researcher will store the encrypted thumb drive in a locked file cabinet in a home office. The data will be stored for five years following the close of the study. At that time, the data will be destroyed. The participants will be informed that any information they provide will be kept confidential.

Participants who consent will be given a demographic questionnaire to complete written in English and Spanish on which they will be asked to provide age, gender, years of education, and the amount of time living in the United States.

Region One Education Service Center does not discriminate on the basis of age, race, color, national origin, gender, or disability.

Region One ESC Adult Education responsibilities include providing a classroom at a program site, after IRB approval has been received from Walden, for study to take

place in order to ensure confidentiality. Participants will have access to water and restroom facilities. The classroom will have good lighting and ventilation.

Site personnel will be available in case of any unexpected situation or crisis. It is clear that

Walden does not sponsor, and/or assume liability for the program/intervention under study. Region One is responsible for changes that occur during normal operations and during the course of the study.

Region One will reserve the right to withdraw from the study at any time if circumstances change.

I understand that the organization will not be named in the doctoral project report that is published in Proquest.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

LeeRoy Corkill, Administrator
Region One Education
Service Center Office of
Adult Education
(956) 984-6270

Appendix D: KSCAr

NAME:	
CASEBOOK No.	
DATE:	
RATER:	

Sub-Test	Scores	Performance Comments
1. Orientation /10		
3.a) Digits Forward /5		
b) Digits Backward /4		
4. Word Recall /10		
5. Visual Memory /6		
6. Word Finding /10		
7. Reading /3		
8. Abstract Thought /8		
9. Calculation Score /4		
10. Writing /4		
11. R/L Orientation /10		
12 Verbal Comprehension /10		
13. Delayed Recall /10		
14. Recognition /10		
15. Copying /4		
16. Spatial Reversal /5		
17. Ideomotor /3		
18. Clock Test /7		
19. Perseveration /2		

Sub-Totals		Normal Percentile	Dementia Percentile
Language /39			
Visual-Motor /31			
Memory /55			
Total Score /125			

For score percentile conversions see last 3 pages (34-36)

KSCAr

Name _____ Age _____

M F

Date of Birth _____ Case No.

_____ (day / month / year)

First Language

_____

Education:

_____

Last Occupation

_____

Patient Status: Inpatient ____ Consultation ___ Outpatient ___ Other _____

Living Arrangement (If Not Inpatient): Alone _____ With spouse _____ Age peer ____

With younger caregivers ____ Institution _____

Present Assessment: Date _____ Time _____ a.m./p.m.

(day/month/year)

Place _____

Examiner _____

Lateral Dominance: Right ___ Left ___ Mixed ___ Unknown ___

For This Exam: Was Vision Adequate Yes ____ No ____

Was Hearing Adequate Yes ____ No ____

Physical Handicaps:

_____

(Affecting Performance)

_____

_____

Significant Meds:

_____

_____

_____

OBSERVATIONS DURING EXAMINATION

(**normal** response is larger and bolded)

BEHAVIOUR AT TIME OF EXAMINATION

OVERLY PERSISTENT	1	2	**3**	4	5	GIVES UP EASILY
UNCONCERNED	1	2	**3**	4	5	ANXIOUS
RELAXED			**1**	2	3	RESTLESS
FULLY ALERT			**1**	2	3	DEPRESSED LEVEL OF CONSCIOUSNESS
GOOD CONCENTRATION			**1**	2	3	EASILY DISTRACTED
COOPERATIVE			**1**	2	3	UNCOOPERATIVE

LANGUAGE USAGE

ARTICULATION GOOD		**1**	2	3	ARTICULATION POOR
SPONTANEOUS SPEECH		**1**	2	3	SPEAKS ONLY WHEN SPOKEN TO
FLUENT SPEECH		**1**	2	3	NONFLUENT SPEECH
NORMAL SPEECH		**1**	2	3	PERSEVERATIVE SPEECH

RECORD ALL RESPONSES

1. ORIENTATION

"WHAT IS" **Responses and Observations**

1. **"YOUR FULL NAME?"** _____

0 1

2. **"YOUR AGE?"** _____

0 1

3. **"YOUR BIRTH DATE?"** _____ 0

1

4. **"WHERE ARE WE NOW?"** _____

0 1

5. **"WHAT CITY (TOWN OR VILLAGE) IS THIS?"** _____

0 1

6. **"WHAT DAY OF THE WEEK IS THIS?"** _____

0 1

7. **"WHAT MONTH IS THIS?"** _____

0 1

8. **"WHAT YEAR IS THIS?"** _____ 0

1

9. **"WITHOUT LOOKING AT YOUR WATCH" (or THE CLOCK)**

WHAT IS THE TIME OF DAY?" _____

0 1

10.**"WHAT IS THE SEASON?"**

_____ 0 1

(a) TOTAL _____/10 2. REMOTE MEMORY* (Verify If Possible)

1. **"WHERE WERE YOU BORN?"** _____ 0 1

2. **"WHERE DID YOU GO TO SCHOOL?"** _____ 0 1

3. **"WHAT WAS YOUR FATHER'S NAME?"** _____ 0 1

4. **"WHAT WAS YOUR MOTHER'S NAME?"** _____ 0 1

5. **"HOW MANY BROTHERS AND SISTERS DID YOU HAVE?"** _____ 0 1

* This sub-test is NOT scored.

3. DIGIT REPETITION

[1 digit/second, even tone of voice; record responses; administer Trial II only if patient fails Trial I; continue until both are failed]

a) Digits Forward

"I AM GOING TO SAY SOME NUMBERS. LISTEN CAREFULLY, AND WHEN I AM

THROUGH, SAY THEM RIGHT AFTER ME."

1. Trial I: **3-7** _____

Trial II: **5-2** _____ 0 1

2. Trial I: **9-4-6** _____

Trial II: **7-1-8** _____ 0 1

3. Trial I: **2-5-8-1** _____

Trial II: **4-7-3-2** _____ 0 1

4. Trial I: **3-1-9-5-8** _____

Trial II: **7-5-9-1-4** _____ 0 1

5. Trial I: **5-3-7-2-8-6** _____

Trial II: **7-1-8-5-6-9** _____ 0 1

TOTAL

_____/5 b) Digits Backward

"NOW I AM GOING TO SAY SOME MORE NUMBERS, BUT THIS TIME WHEN I

STOP I WANT YOU TO SAY THEM BACKWARDS. FOR EXAMPLE, IF I

SAY 7-1-9, WHAT WOULD YOU SAY?"

1. Trial I: **2-4** _____

Trial II: **5-8** _____ 0 1

2. Trial I: **6-9-2** _____

Trial II: **4-1-5** _____ 0 1

3. Trial I: **8-3-7-1** _____

Trial II: **4-9-8-6** _____ 0 1

4. Trial I: **1-6-2-8-5** _____

Trial II: **6-1-7-4-3** _____ 0 1

(b) TOTAL _____/4

4 . WORD RECALL

Use 10 word list (TABLE, FOOTBALL, WINDOW ... APPLE).

USE A BLANK SHEET OF PAPER (i.e. page 7) TO COVER THE WORDS

THAT YOU HAVE NOT YET PRESENTED. SLIDE THE PAPER DOWN

THE LIST SEQUENTIALLY EXPOSING THE LIST ONE WORD AT A TIME.

Present each word for 2 seconds. Ask the subject to

"PLEASE READ ALOUD EACH WORD THAT I SHOW YOU."

DO NOT TELL THE SUBJECT TO TRY AND REMEMBER THEM.

After presenting all 10 words, cover the list and ask the subject

"**PLEASE TELL ME AS MANY OF THE WORDS FROM THAT LIST AS YOU CAN, IN ANYORDER**"

Score = number correct (max = 10).

TABLE	____	**FOOTBALL**	____	**WINDOW**	____
ROSE	____	**COMPUTER**	____	**GLOVE**	____
MOON	____	**FORK**	____	**GOLD**	____
APPLE	____				TOTAL _____/10

5. VISUAL MEMORY [3 designs on 3 pages 10, 12, 14] [Hand patient blank page and pencil with eraser]

"**HERE IS A PIECE OF PAPER FOR YOU. I AM GOING TO SHOW YOU A FIGURE.**

I WOULD LIKE YOU TO STUDY IT FOR 10 SECONDS AND THEN I WILL TAKE IT

AWAY AND I WANT YOU TO DRAW IT FROM MEMORY."

[Remove design after 10 secs; mark the top of the page as used by the patient;

repeat instructions for each design as you hand patient another blank page]

Design 1 _____ 0 1 2

Design 2 _____ 0 1 2

Design 3 _____ 0 1 2

(c) TOTAL _____/6

Note: Pages 9, 11, 13, and 22 are blank for subject responses.

USE THIS PAGE TO COVER WORD LIST

TABLE

FOOTBALL

WINDOW

ROSE

COMPUTER

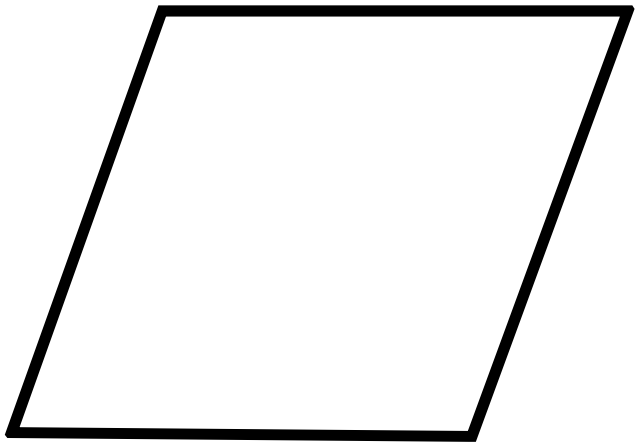
GLOVE

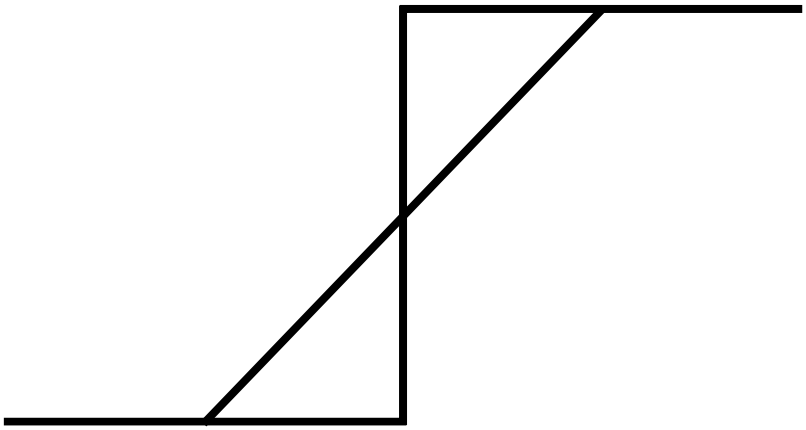
MOON

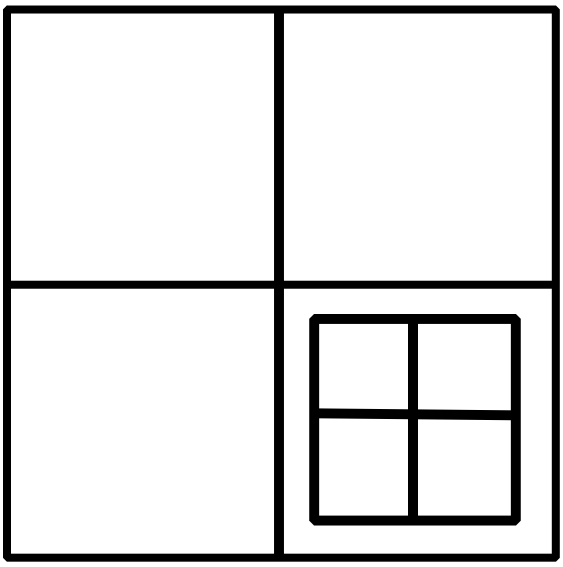
FORK

GOLD

APPLE







6. WORD FINDING [2 picture pages (16, 17)]

Point to each of the pictures in turn "**TELL ME WHAT YOU CALL THIS**"

SCORE If Incorrect, Record Response

1. BOTTLE	0 1	_____
2. UMBRELLA	0 1	_____
3. ELEPHANT	0 1	_____
4. CHIMNEY	0 1	_____
5. KITE	0 1	_____
6. BICYCLE	0 1	_____
7. SPADE (SHOVEL)	0 1	_____
8. FOOT	0 1	_____
9. PEDAL	0 1	_____
10. SPOKES	0 1	_____

(d) _____

TOTAL _____/10

7. READING COMPREHENSION [Story page (18)]

"**NOW I WOULD LIKE YOU TO READ A SHORT STORY AND THEN I WILL ASK**

YOU SOME QUESTIONS ABOUT IT. PLEASE READ SO THAT I CAN HEAR YOU."

[Hand patient the story page; Patient must have story in their possession when answering questions; Tell patient to refer to text; note articulation!]

Mr. Davis had to go to Toronto. He decided to go by bus. His daughter drove him to the bus terminal, but on the way there they ran out of gas. However, they arrived at the terminal just in time for him to catch the bus.

[ ] Unable To Read

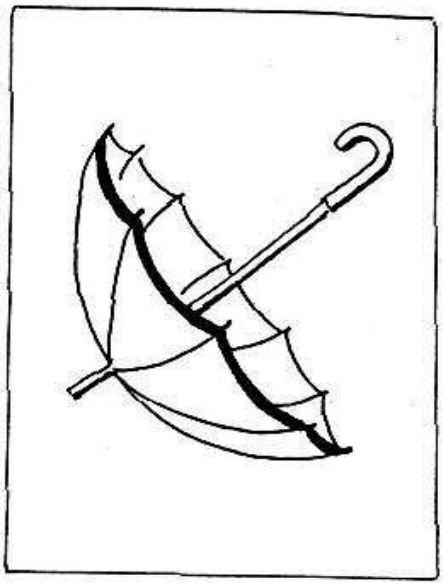
(If patient is unable to read, or does so with great difficulty, proceed to next task.)

"**WHAT CITY WAS MR. DAVIS TRAVELLING TO?**" _____ 0 1

"**HOW DID HE INTEND TO GET THERE**?" _____ 0 1

"**WHERE WAS HIS DAUGHTER DRIVING HIM?**" _____ 0 1

(e) TOTAL _____/3



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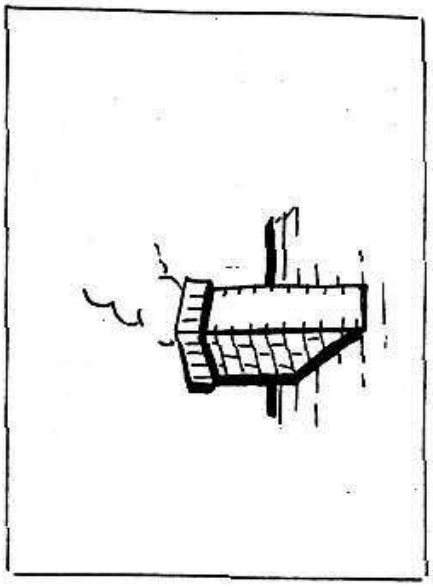

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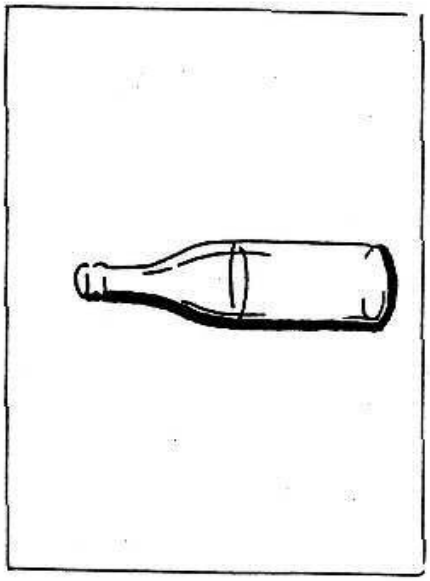

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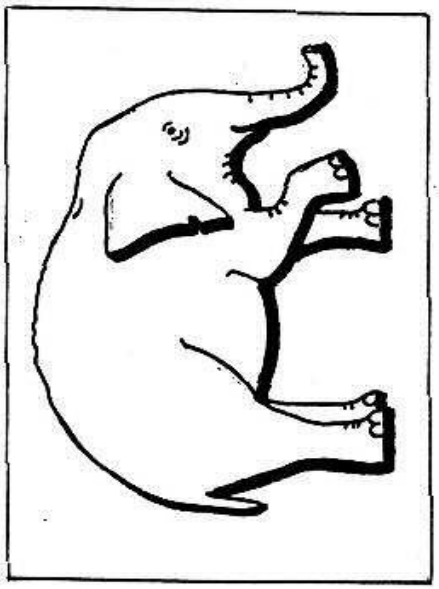

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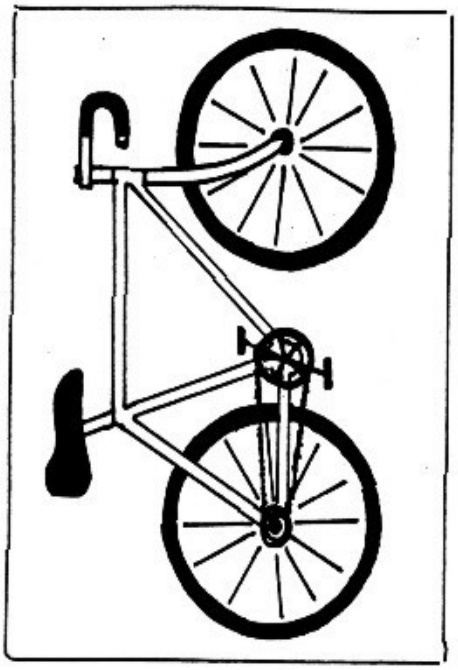

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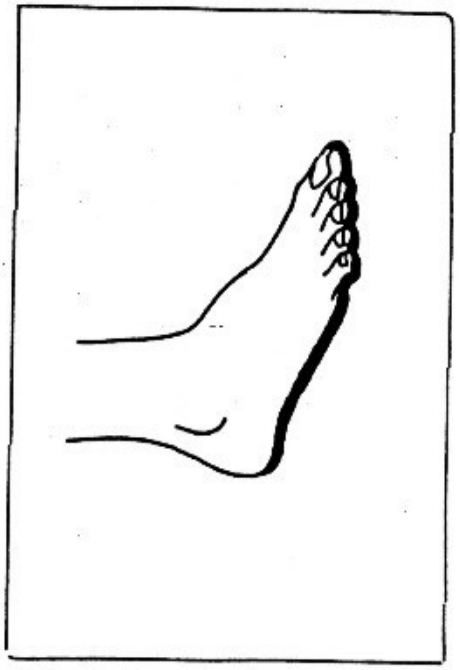

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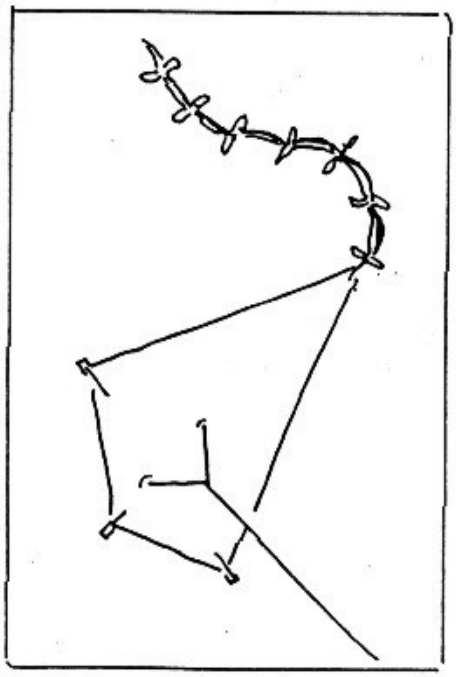
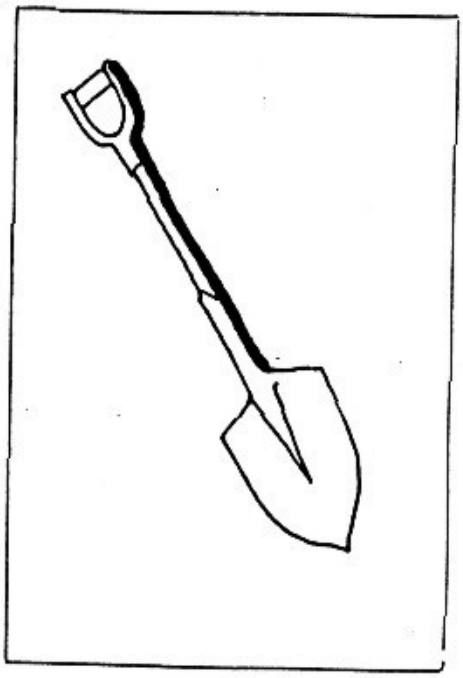


1



3

Mr. Davis had to go to Toronto. He decided to go by bus. His daughter drove him to the bus terminal, but on the way there they ran out of gas. However, they arrived at the terminal just in time for him to catch the bus.

8. ABSTRACT THINKING [RECORD ALL RESPONSES]

1. "**IN WHAT WAY ARE CARROTS AND BEANS ALIKE?**"

[If patient fails to give a 2 point answer, say "**THEY ARE BOTH VEGETABLES**"]

_____ 0 1 2

2. **"IN WHAT WAY ARE A SHIRT AND A SWEATER ALIKE?"**

[If patient fails to give a 2 point answer, say "**THEY ARE BOTH ITEMS OF CLOTHING**"]

_____ 0 1 2

3. **"IN WHAT WAY ARE A DOG AND A COW ALIKE?"** [No help]

_____ 0 1 2

4. **"IN WHAT WAY ARE A CAR AND A BICYCLE ALIKE?"** [No help]

_____ 0 1 2

TOTAL _____/8

9. CALCULATION

"I WANT TO ASK YOU A FEW MORE QUESTIONS: HOW MUCH IS"...

1. **2 PLUS 4 (2 + 4)** = _____ 0 1
2. **9 MINUS 2 (9 - 2)** = _____ 0 1
3. **5 TIMES 5 (5 X 5)** = _____ 0 1
4. **56 DIVIDED BY 7 (56 ÷ 7)** = _____ 0 1

(f) TOTAL _____/4

10. WRITING [Use blank page (20)]

"**NOW I WOULD LIKE YOU TO WRITE SOMETHING** "

a)"**FIRST YOUR NAME, PLEASE**". 0 1

b)"**AND NOW I WANT YOU TO WRITE: KINGSTON, ONTARIO, CANADA**"*

[Repeat, if patient forgets it]

(g) 0 1 2 3

* use a more familiar local address (of similar length) if the patient is not from Kingston. *Note: Patient must write (i.e. use script) not print. If patients start to print, correct them, if they persist, score is 0.*

TOTAL _____/4

(h) (For Writing)

11. RIGHT/LEFT ORIENTATION and

12. VERBAL COMPREHENSION

NOTE: while Right/Left Orientation and Verbal Comprehension are run together as one task, they are scored separately as two distinct tasks. Ask the patient to

TABLE ____	**FOOTBALL ____**	**WINDOW ____**
ROSE ____	**COMPUTER ____**	**GLOVE ____**
MOON ____ APPLE ____	**FORK ____**	**GOLD ____**

R / L TOTAL _____/10

Part

1. "**TOUCH YOUR LEFT SHOULDER**." _____ 0 1 0 1

2. "**TOUCH YOUR RIGHT ELBOW**." _____ 0 1 0 1

3. "**TOUCH YOUR RIGHT EAR**." _____ 0 1 0 1

4. "**TOUCH YOUR LEFT HAND**." _____ 0 1 0 1

5. "**TOUCH YOUR RIGHT ANKLE**." _____ 0 1 0 1

6. "**TOUCH YOUR LEFT KNEE**." _____ 0 1 0 1

7. "**TOUCH YOUR LEFT THUMB**." _____ 0 1 0 1

8. "**POINT TO MY LEFT HAND**." _____ 0 1 0 1

9. "**POINT TO MY RIGHT ARM**."_____ 0 1 0 1

10."**POINT TO MY RIGHT ELBOW**."_____ 0 1 0 1

TOTAL Sub-Test 11 _____/10

TOTAL Sub-Test 12 _____/10

13. DELAYED WORD RECALL

"PLEASE TELL ME AS MANY WORDS THAT YOU CAN REMEMBER FROM THE LIST THAT I SHOWED TO YOU EARLIER, IN ANY ORDER"

Score = number correct (max = 10).

14. WORD RECOGNITION

After completing the recall, show the subject the second list of 20 words [pages 23,24] (TABLE, HOUSE, BOWL, .. BIRD), point to the first word and say to the subject

"DID YOU SEE THIS WORD ON THE LIST THAT I SHOWED TO YOU EARLIER OR IS THIS A NEW WORD?"

Repeat these instructions for the 2nd word. But for the 3rd word say **"HOW ABOUT THIS**

ONE?"

For the 4th word onward, use either instruction as seems necessary.

After completing the lst page go to the second one (GLOVE, KING ....)

Score = total number of correct responses i.e. IN/10 + NOT IN/10 = Total/20 ÷ 2 (max = 10).

	IN	NOT IN
TABLE		
HOUSE		
BOWL		
FOOTBALL		
WINDOW		
LAKE		
ROSE		
DRESS		
WHEAT		
COMPUTER		
GLOVE		
KING		
MOON		
CLOCK		
GIFT		
FORK		
GOLD		
STORE		
APPLE		

SCORE	**/10**	**/10**

BIRD		

(i) TOTAL = _____ /20 ÷ 2 = _____ /10

TABLE

HOUSE

BOWL

FOOTBALL

WINDOW

LAKE

ROSE

DRESS

WHEAT

COMPUTER

GLOVE

KING

MOON

CLOCK

GIFT

FORK

GOLD

STORE

APPLE

BIRD

15. COPYING [2 design pages (26, 27)]

"**HERE I HAVE A FIGURE FOR YOU TO COPY**" [avoid naming designs].

a.) [diamond]_____ 0 1 2

b.) [arrow]_____ 0 1 2

TOTAL _____/4

16. SPATIAL REVERSAL

"**NOW I WANT YOU TO DRAW ANOTHER ONE LIKE THIS**" [point to arrow]

"**BUT THIS TIME POINTING THE OPPOSITE WAY**". [avoid indicating direction]. 0 5

TOTAL _____/5

17. IDEOMOTOR

1. "**SHOW ME HOW YOU WOULD STIR A CUP OF TEA**" _____ 0 1

2. "**SHOW ME HOW YOU WOULD HAMMER A NAIL**" _____ 0 1

3. "**SHOW ME HOW YOU WOULD BLOW OUT A CANDLE**" _____ 0 1

TOTAL _____/3

18. CLOCK [4 circle pages (28 - 31)]

[1st circle - blank]

"**I WANT YOU TO WRITE IN THE NUMBERS, AS ON A CLOCK FACE.**" 0 1 2

[2nd circle - blank]

"**ON THIS CIRCLE DRAW IN THE HANDS TO MAKE IT SAY 9 O'CLOCK.**" 0 1 2

[3rd circle - numbered]

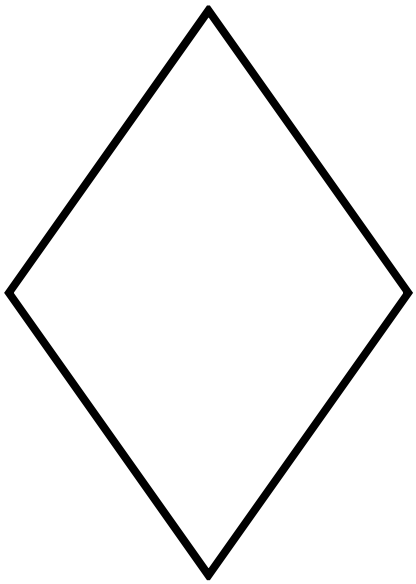
"**NOW TRY THIS ONE.**

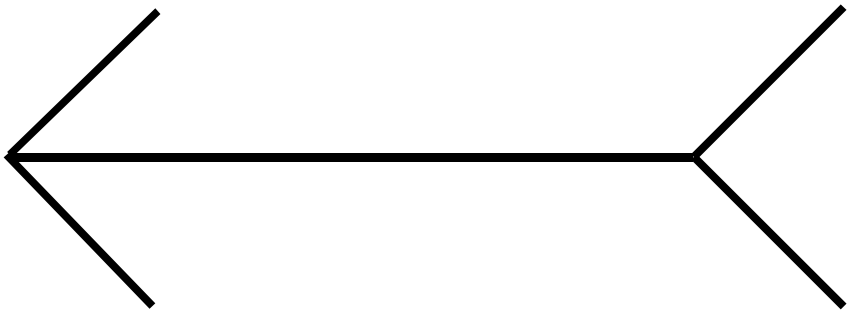
PUT IN THE HANDS FOR 5 PAST 10. MAKE IT SAY 5 PAST 10." 0 1 2

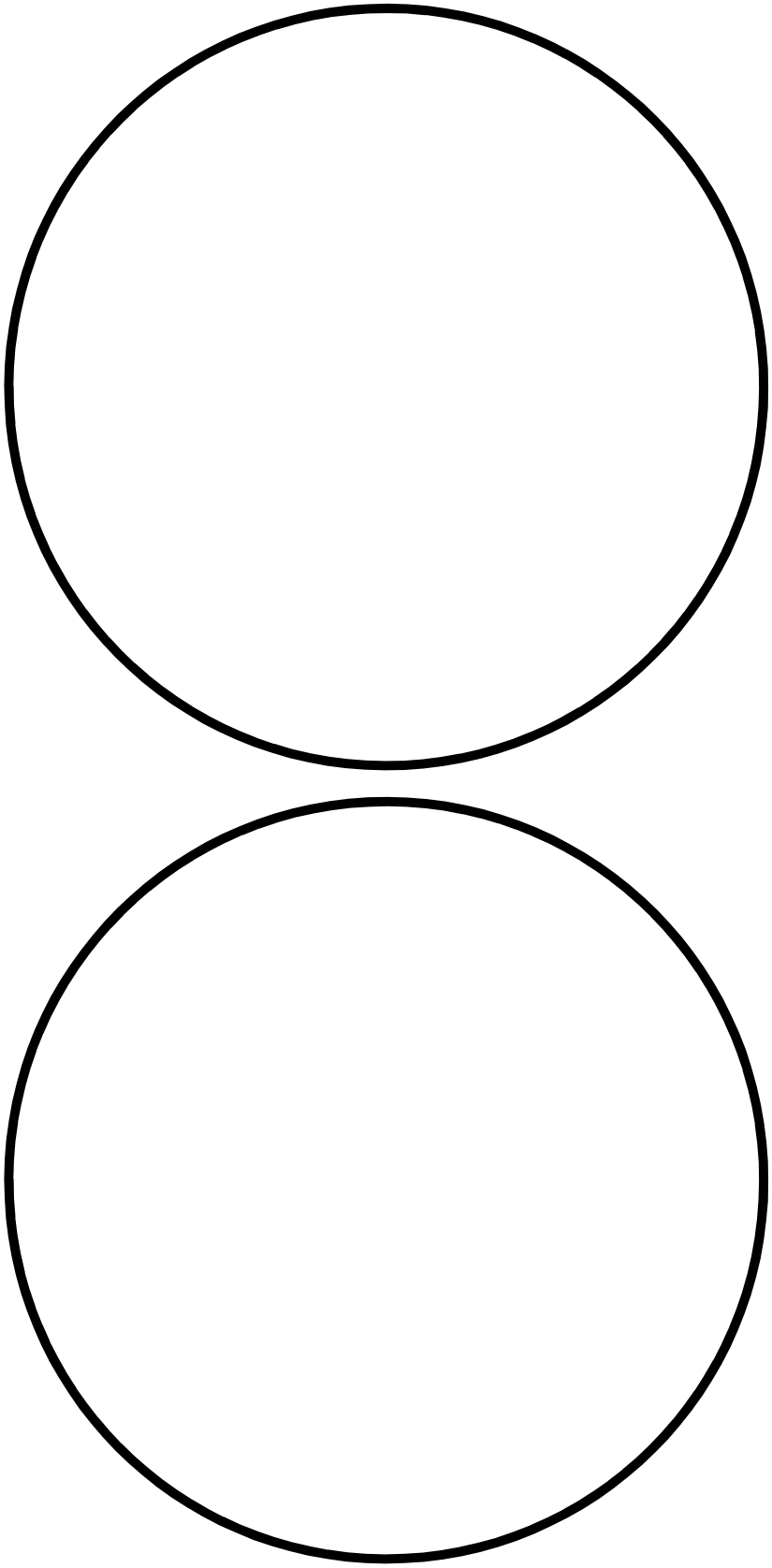
[4th circle - numbered and hands (20 past 8)]

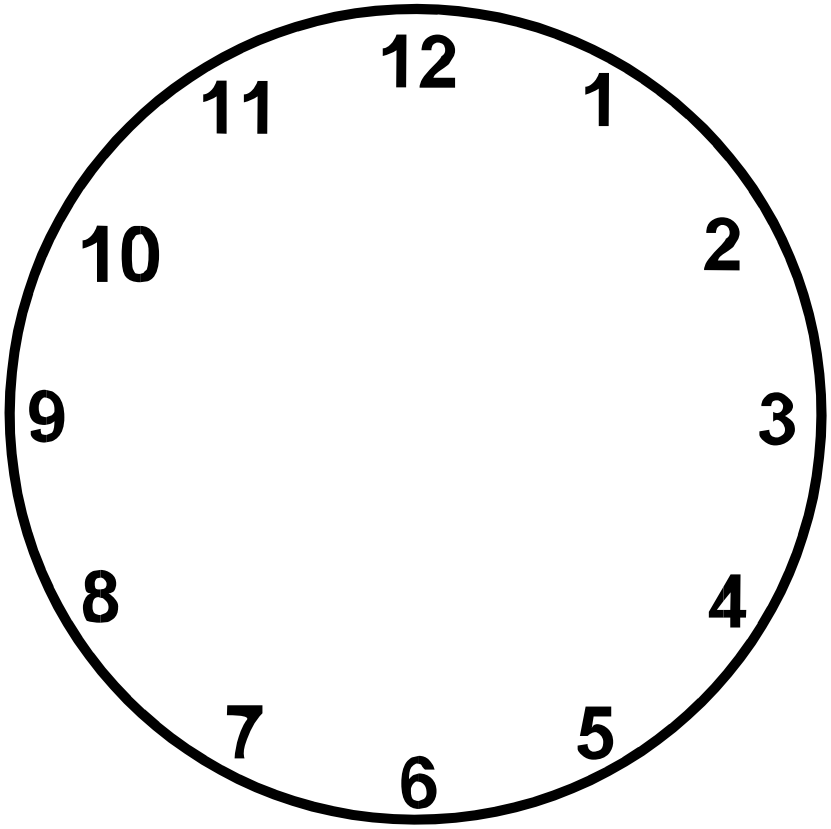
"**WHAT TIME IS IT ON THIS CLOCK?**" 0 1

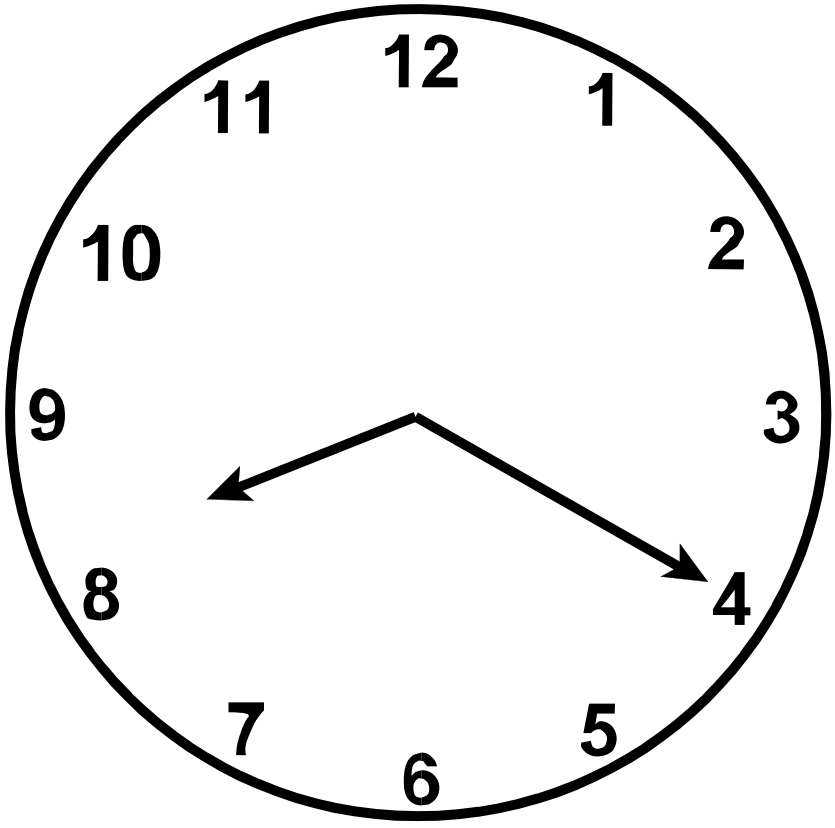
(j) TOTAL _____/7








12
1
2
3
4
5
6
7
8
9
10
11


12
1
2
3
4
5
6
7
8
9
10
11

19. PERSEVERATION

a) *Motor Pattern*:

[Demonstrate touching table alternately first with palm of hand and then with fist on edge, i.e., thumb facing up. Movements should be alternated at a rate of not faster than one movement per ½ second and no slower than one movement per second. Have the patient copy your motions for 5 trials or until you are sure that the patient has learned the pattern.] If patient is unable to learn the task within 10 trials, discontinue and score 0. If patient has successfully learned the task, then say:

"**I WANT YOU TO REPEAT THIS MOVEMENT ON YOUR OWN UNTIL I SAY 'STOP**'."

[If patient is unable to do this after several attempts, say "STOP". Otherwise let him/her do at least five repetitions using his/her preferred hand.]

(k) 0 1

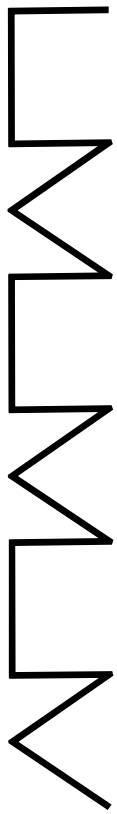
b) *Visual Pattern*: [sheet with pattern (page 33)]

"I WANT YOU TO COPY THIS PATTERN. START COPYING BELOW THE EXAMPLE, AND THEN CONTINUE IT TO THE END OF THE PAGE. START HERE"

[Point to the space below the pattern. Encourage patient to continue to right margin of page, such that the design is not just copied, but repeated twice. If patient makes an error while copying the pattern (but not while continuing it) draw it to the patient's attention the first time and refer back to the pattern. After this, no further help.]

0 1

(l) TOTAL _____/2



SCORE ANALYSIS Page 1

(See Adm & Scoring Manual - Page 41)

START

STEP 1: Previous Level?

WHAT LEVEL DID THE PATIENT FUNCTION AT PREVIOUSLY?
Above Avg ___
Average ___
Below Avg ___

STEP 2: Compare to Normals

USING THE CHART FOR NORMALS (right), CIRCLE THE PATIENT'S TOTAL SCORE AND READ THE PERCENTILE AND RANGE THAT THE SCORE FALLS IN.
Percentile ____
Range: Above Avg ____
Average ____
Below Avg ____

STEP 3: Is there evidence of decline?

IS THERE A DIFFERENCE BETWEEN THE PATIENT'S SCORE AND YOUR PREMORBID ESTIMATE?

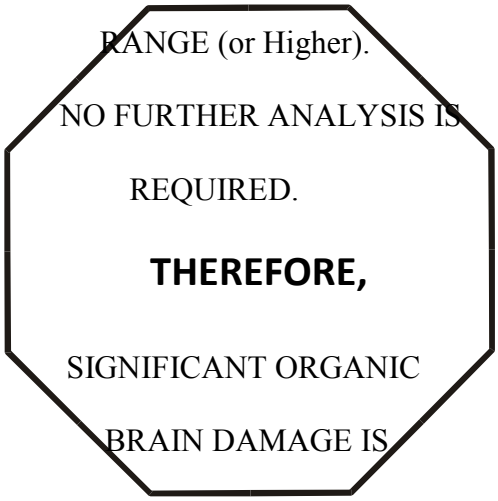
NO

STOP!

NORMALS

TOTAL SCORE	PERCENTILES	RANGE
123	98	
118	95	↑
117	91	A
116	88	V
115	86	G
114	80	
113	75	A
112.5	68	V
112	61	E
111	54	R
110.5	50	A
110	44	G
109	32	E
108.5	26	
108	20	↓
107	14	A
106	12	V
105	5	G
104	2	

THE PATIENT'S SCORE IS **YES**



FURTHER

ANALYSIS IS REQUIRED.

GO TO STEP 4 ON NEXT PAGE

KSCAr SCORE ANALYSIS Page 2

DEMENTIA

STEP 4: What is the

TOTALSCORE	PERCENTILES	RANGE
105 103 102 100	**95** **91** **88** **84**	M I L D
98 96 94 93 91 89 87	**78** **73** **65** **61** **54** **50**	M O D E

degree of decline?

NEXT PAGE

KSCAr36

USING THE CHART FOR DEMENTIA (right), CIRCLE THE PATIENT'S TOTAL SCORE AND READ THE PERCENTILE AND RANGE.

Percentile _____

Range: Mild ____
Moderate ____
Severe ____

85	**44**	RATE
83	**39**	
82	**34**	
80	**30**	
77	**26**	
	20	
74	**11**	SEVERE
72	**10**	
68	**8**	
62	**5**	

GO TO

KSCAr SCORE ANALYSIS

Page 3

DEMENTIA

SUB-TOTAL SCORES Language Visual-Motor Memory

Score	Percentiles	Range	Score	Percentiles	Range	Score	Percentiles
	95			**95**	UNIMPAIRED	38	**98**
						37	**96**
				86		36	**92**
	78	UNIMPAIRED	31	**79**		35	**86**
	75					34	**83**
			30				
	65						
			29 28	**68**			
39			27	**66**	MILD	33	**77**
						32.5	**75**
38			26	**62**		32	**68**
			25	**59**			
				50		31	**64**
	61					30	**60**
		MILD				28	**56**
	50		24	**42**			
	42		23	**37**	MOD	27	**46**
37			22	**36**		26	**39**
36						25	**26**

STEP 5: Which area(s) are most affected?

CIRCLE THE 3 SUB-TEST SCORES ON THE CHART TO THE RIGHT. OBTAIN LEVELS AND DESCRIPTIONS FOR EACH.

LANG VIS-MOT MEM

%ile _____ _____ _____

(Circle One) (Circle One) (Circle One)

Unimp* Unimp* -

Mild Mild Mild

Mod Mod Mod

Severe Severe Severe

* Unimpaired

35	**36**		21	**29**	ERATE	24	**23**
34	**30**		20	**23**			
33	**23**	MODERATE					
32	**15**						
31	**8**		19	**15**	SEVERE	22	**15**
			18	**12**		21	**10**
30	**7**		17	**9**		20	**7**
28	**5**	SEVERE	15 12	**5**		19	**6**
24	**2**			**3**			