THE EFFECTS OF ANIMATION AND CUEING IN THE ACQUISITION OF

SPANISH VOCABULARY

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THE EFFECTS OF ANIMATION AND CUEING IN THE ACQUISITION OF SPANISH VOCABULARY

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THESIS ABSTRACT

THE EFFECTS OF ANIMATION AND CUEING IN THE ACQUISITION OF SPANISH VOCABULARY

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According to Paivio's (1971, 2007) Dual Coding Theory (DCT), cognitive information is stored in two separate systems, the visual and the verbal system. Both are linked through cognitive connections that lead to better memorization and remembering of both words and images. The current thesis intends to study the use of dynamic and static images in Spanish L2 vocabulary acquisition and the effects of cueing when presented with those two types of visual representations. An experiment was conducted in twenty-two sections of beginner Spanish at Auburn University in four days. Two conditions were applied, i.e. dynamic versus static images and cueing versus absence of cueing. The twenty-two sections were divided in four treatment groups: static and

absence of cueing (Control group), static and cueing (Group A), dynamic and absence of cueing (Group B), and dynamic and cueing (Group C). In order to gather data, participants were provided a recall and a recognition test both in a short term (after instruction) and a long term period (thirty-six days after instruction). Also, recall was divided in two different analyses: effectiveness (i.e. when the words were correct or orthographically related to the original) and production (i.e. only exact words were considered right). Results showed that there are no significant differences in the use of dynamic and static images in four of the six tests. However, dynamic images proved to be more effective in the short term recall test when measuring production. On the contrary, static images proved to be significantly better than static images in the long term recall test when measuring production. Discussion on the findings is presented.

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Style manual used: Publication Manual of the American Psychological Association. Fifth Edition.

Computer software used: Microsoft Word and SPSS 16.0

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CHAPTER ONE

INTRODUCTION

1.1. Introduction

One of the fields in which the study of L2 vocabulary has paid special attention has been the use and effects of visual stimuli in memorization. One of the most influential theories on memory and cognition is Paivio's (1971, 2007) Dual Coding Theory (DCT). This theory defends the position that the human cognition is split into two different coding systems, i.e., the visual coding system and the verbal coding system. Information is linked within and between these two systems through referential, associative, and sensory connections. Therefore, learning an image will lead us to a specific word and vice versa. Also, stronger memorization will happen if both the image and the words are hold in and connecting between their corresponding systems. However, a question arises when differentiating between different types of images. Research conducted in L1 and L2 has tried to clarify the implications and effects of using dynamic and static images in vocabulary learning. The researcher believes that not all images are the same as they do not provide the same amount of information. Colors, forms, or movement, for example, might allow understanding more clearly what the image is showing. However, Weiss, Knowlton, and Morrison (2002) suggest that, from a cognitive perspective, images are stored in the visual system and that there are no differences in use in terms of the type of

image. Mayer and Moreno (1998) introduce the Dual Processing Theory which proposes that, from a processing perspective, images and text are stored in the same system and suggest that presenting them together may create an overload of the system. Therefore, they argue that images should be presented with audio instead of text.

These statements indicate that using animated images, in comparison to static images, might not have an effect in vocabulary learning. As Weiss et al. (2005) indicate, if a static image is as informative as a dynamic image, there is no need to use dynamism for the presentation. However, that statement is provided in a L1 context and the researcher believes that the same cannot be applied in L2.

Research conducted in L1 has provided inconclusive results. Some studies provide positive effects on the use of animation in instruction (Mayer, 1994; Rieber, Boyce, & Assad, 1990). Many other studies were proved to be inconclusive or even benefited from the use of static images (Mayer, Hegarty, Mayer, & Campbell, 2005; Owens and Dwyer, 2005; Wilson & Dwyer, 2001; Mautone & Mayer, 2001; Rieber, 1990; Rieber, 1989; Rieber & Hannafin, 1988). However, research conducted in L2 acquisition on the comparison between static and dynamic images is not as abundant as research in L1 (Lin & Chen, 2006, 2007; Sun & Dong, 2004; Xiao & Jones, 1995). Furthermore, the researcher could not find any study that was fully conducted in the classroom where the real instruction takes place.

In this study, I want to provide some evidence on the use of animated images in the acquisition of L2 Spanish in comparison to the use of static images. Chapter one introduces the study and states the goal of the study. Chapter two reviews the most

influential papers and research on the use of dynamic and static images in L1 and L2. Chapter three describes the methodology followed when the study was conducted. Chapter four explains the results obtained through data analysis. Finally, chapter five discusses of the most relevant findings.

1.2. Research Questions

The present study tries to address to the following questions:

1. Do dynamic images improve the acquisition of L2 Spanish vocabulary more than static images?
2. Does cueing, when presented with static and dynamic images, affect the acquisition of L2 Spanish vocabulary?
3. Does cueing, when presented with dynamic images, overload the visual systems according to Mayer and Moreno's (1998) Dual processing theory?

CHAPTER TWO

LITERATURE REVIEW

2.1. Second Language Vocabulary Acquisition

Traditionally, Second Language Acquisition (SLA) research has been directed towards the study of syntax and phonology (Zimmerman, 1997; Nation, 2001). In contrast, less emphasis has been placed on second language vocabulary acquisition until recently. It gained importance when researchers found that the study of grammar does not provide the learner of a second language all the necessary tools to communicate successfully. Knowing about how a language functions, i.e., its grammar, does not entail the ability to use it appropriately. In this sense, producing a foreign language is like building a house. One might have the theoretical knowledge of how to build it, but the house will never be built without other essential materials, e.g. vocabulary.

Knowing a word, however, is complex. Nation (2001) argues that knowing a word is to know its meaning, its function, and its use. In other words, vocabulary learning does not only involve form recognition - spoken or written -, but also the position - grammar and collocation -, its function - frequency and appropriateness -, and meaning - concept and associations - (Nation, 1990). However, these fields evolving word knowledge are gradually organized. First, the learner discovers what real concept

the word refers to and then pays attention to its appropriate use, as stated by Nation (1990).

Ma & Kelly (2006) distinguish two perspectives in the acquisition of vocabulary: Implicit and explicit learning. Implicit vocabulary learning proposes that vocabulary should be presented naturally and without effort and learning will happen accidentally. Learners must be exposed to as much input language as possible. Explicit vocabulary learning, on the other hand, validates the necessity of mentally engaging the learner through strategies to make vocabulary store and retrieve more efficiently.

One of the most influential models of implicit vocabulary learning has been presented by Krashen's Second Language Acquisition Theory (Krashen, 1982) and the Natural Approach (Krashen & Terrell, 1983). They present five hypotheses to account for Second Language Acquisition. The first is the Learning-Acquisition Hypothesis which posits that acquisition is subconscious while learning is conscious. The former is a product of communication and the latter of studying; both might lead to the mastering of the language. The second hypothesis, the Natural Order, states that some grammatical structures are acquired in a predictable order, similar to the order in L1, and that some structures are acquired before. However, this hypothesis argues that not all acquirers follow the same order when acquiring these structures. The third hypothesis is the Monitor Hypothesis which argues that production starts with the acquired system of the language while the learned system, called the Monitor, only plays a role before or after linguistic production. If the Monitor acts after production, it performs a self-repair action, i.e., applies the learned rules to correct the produced utterance. Next, the Input

Hypothesis, one of the most influential Krashen's hypotheses, states that i+1 input, i.e., information beyond the level of competence of the learner, leads to acquisition. Finally, the Affective Filter Hypothesis states that affective variables play an important role in converting input (i.e., received information) into intake (i.e., processed information). When that filter is opened, there is a higher chance to achieve intake because the student is motivated, confident and there is no anxiety. In contrast, when the learner is not motivated, confident or is anxious, the filter is closed resulting in reduced language acquisition. The authors also point out that other variables as aptitude, the role of the first language, individual differences, and age can also affect the level of acquisition.

In contrast, explicit vocabulary learning states that vocabulary words and learning strategies must be taught in order to create a vocabulary base for the learner. Nation (2001) argues that low level learners need a set of high frequency words (2,000 words) in order to reach a minimum vocabulary for effective comprehension. This can be achieved by direct teaching (teacher explanation, peer teaching), direct learning (using word cards, consulting dictionaries), incidental learning (contextual guessing, communicative activities), and planned encounters with the words (graded reading, vocabulary exercises).

The explicit vocabulary learning hypothesis also supports the idea that instruction of learning strategies is necessary for students to be able to find their own ways of expanding their vocabulary knowledge. Oxford and Scarcella (1994) divide these strategies into three types: (i) decontextualized, (ii) partially contextualized, and (iii) fully contextualized. Decontextualized activities must be carefully used in the classroom and

are not as effective as the other two strategies. They include the use of word lists, flash cards, and dictionaries. Partially contextualized learning strategies refer to word grouping, word or concept association, visual imagery, aural imagery, keyword, physical response, and semantic mapping. Each of these activities provides some degree of context. Finally, fully contextualized strategies involve vocabulary learning in authentic communication.

Oxford and Scarcella (1994) affirm that the differentiation of these three types of strategies does not indicate that they should be taken separately, but rather it suggests that more vocabulary can be acquired if more strategies are used. Moreover, context is vital as guessing from context is probably the most effective learning strategy. It is expected that providing students with partially contextualized strategies in a fully contextualized context will result in better vocabulary learning. In the following sections, I will present a theoretical background that supports the use of image-style strategies for the enhancement of vocabulary acquisition.

2.2. Paivio's Dual-Coding Theory (DCT)

Paivio's Dual-Coding Theory (Paivio, 1971, 2007; Paivio and Begg, 1981) is a seminal work on the acquisition of vocabulary that is supported by a vast body of research such as the power of animation in memory (Wilson & Dwyer, 2001; Owens & Dwyer, 2005; Zhu & Grabowski, 2006; Mayer, 1994; Mayer & Moreno, 1998; Mayer et al., 2005; Mautone & Mayer, 2001; Rieber, 1989, 1996; Rieber & Hannafin, 1988; Rieber, Boyce, & Assad, 1990), the influence of animation (Lin & Chen, 2007; Kuo & Hooper, 2004; Nassaji,

2004; Hew & Ohki, 2004; Lai, 2000; Chang, Lin, & Lee, 2005), and the influence of cognitive strategies in L2 (Shapiro & Walters, 2005; Atkinson & Raugh, 1975; Saltz & Donnenwerth-Nolan, 1981). As explained by Kobayashi (1986), the power of this theory comes from the intensive research that supports it.

Paivio (1971, 2007) states that the information can be divided into two different coding systems, a visual coding system and a non-visual coding system. On the one hand, the visual coding system contains all the visual information while, on the other hand, the non-visual code system deals with all the linguistic information, i.e., the word. Paivio and Begg (1981) refer to the elements contained in the visual system as *imagens* and the elements contained in the non-visual system as *logogens*[1]. Imagen can constitute any pictorial representation either given or internally created. This means that the visual system controls not only the elements of the real world that we can see but also the representations that human beings can generate themselves.

Paivio (2007) explains that, although the visual and the verbal systems are independent, there are certain cognitive connections that relate the contents of both systems. The first type of connections refers to associations of logogens and imagens within each system, i.e., logogens associate to logogens in the verbal system and imagens associate with imagens in the visual system. Both visual and verbal systems possess internal correlations in their systems. Paivio and Begg (1981) illustrate this with an example of a face. A face can be a single imagen but it is compound of other imagens smaller in hierarchy such as eyes, mouth, nose, etc. Similarly, logogens can relate within the verbal system because human beings connect words with words and can differentiate

[1] Paivio borrowed this term from Morton (1969)

between synonyms and antonyms. Secondly, there are connections that relate the verbal and visual content with information outside. For example, relations with the external world occur through sensory and motor connections. These exist outside of the two systems and they relate the information contained in the visual and verbal systems to the real world. Sensory connections are visual, auditory, and haptic (by active touch) while the motor relations are established through drawing, writing, and signing. They relate independently to the elements of both systems although they do not affect the way imagens and logonens relate to each other. Also, Paivio (2007) explains that, while sensory stimuli can relate to any verbal or imaginable item, the opposite cannot happen. There is no image or word that can produce a feeling or emotion by itself.

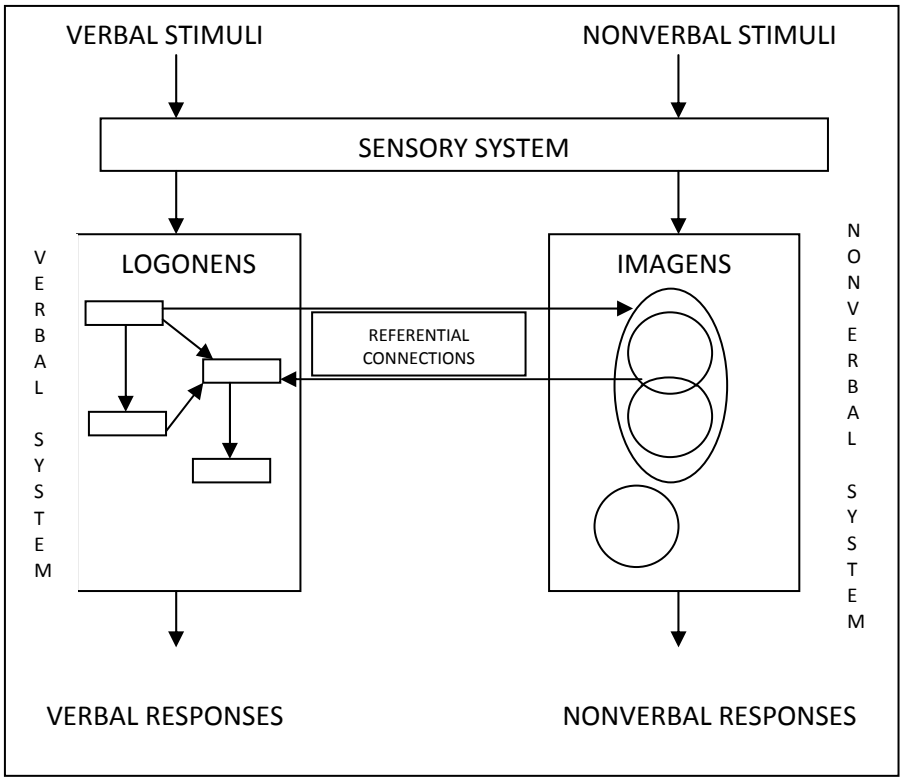

Figure 1. Schematization of Paivio's Dual-Coding Theory and cognitive connections

Finally, Paivio distinguish referential connections. These references reciprocally connect both logogens and imagens from the verbal and visual systems. That is, by naming an object in the world, one can create a representational image of that object. Similarly, a visual representation of an item can be linked to a verbal one. In a more practical way, if we see a picture of a cat, we can name what we see with the word *cat*. The opposite also occurs. If we hear the word *cat*, we can easily recall or generate a picture that represents that concept. Therefore, as Mayer (1994) points out, referential connections have a direct effect on memory. That is, information will be better memorized when it is processed in both systems rather than only one because if part of the information is lost, the other still remains.

2.3. Research on the Contents of the Study

2.3.1. Visual Stimuli as Vocabulary Strategy

As reported by Kobayashi (1986), the earliest studies conducted with pictures date back at the end of the 19th century and focus on the human capacity for retention and memorization. It was shown that pictures could be remembered up to an 87.0% and 57.7% after 7 days and 120 days of their presentation respectively. Later, similar investigations studied the relations between verbal information and pictures. Investigation demonstrated that visual stimuli enhance vocabulary learning (Webber, 1978; Jones & Plass, 2002; Nassaji, 2004). Deno (1968) explained that images and words cannot be considered as equivalent stimuli when representing the same concept. With new developments and advances in technology, new perspectives in the field

evolved. More recently, research on visual stimuli has been focused on the use of dynamic representations in Computer Based Instruction (CBI). In this section, I review the most relevant research related to the field of visual stimuli and the use of animation in L1 and L2 acquisition.

2.3.1.1. Static versus Dynamic images

The introduction of dynamism into CBI became a popular area of discussion for scholars at the beginning of the 1980's (Rieber, 1990) and its study continues today although scholars look at it with more critical eyes. Authors like Rieber (1990, 1994), Xiao and Jones (1995), and Weiss et al. (2002) collect and present important guidelines on the use of animation and when it should be used instead of static visual materials.

Xiao and Jones (1995) argue that computer animation improves learning but they state the need to clarify some criteria for the use of animated materials in the classroom. Similarly, Weiss et al. (2002) point out that most research to date has focused on empirical research in animation but has not defined the principles that lead to its use. Rieber (1994) and Weiss et al. (2002) introduce these criteria. All these authors investigated the role of animation as visual stimuli in CBI in comparison to static visual stimuli. Their investigation gives some insight on the role that animation plays in designing materials.

Weiss et al. (2002) highlight some criteria to take into consideration in deciding between the uses of static or dynamic images. They argue that preference should be given to static images if the dynamic ones provide the same amount of information.

First, following Rieber (1994), they agree that dynamic pictures should only be used when they differentiate from static images in their capacity to provide trajectory and movement. Moreover, they state, following Paivio's Dual-Coding Theory (Paivio, 1971, 2007; Paivio and Begg, 1981) that dynamic and static visuals follow the same usage principles, i.e., in terms of use, both static and dynamic images have the same representational value. In Paivio's theory, images and words are encoded in two different systems – the visual and the verbal systems. Hence, the comparison between static and dynamic images is irrelevant because all images are hold in the same visual system. However, I would like to point out that if animation presents extra information that static visual stimuli cannot, it is important to separate its informative potential. Mayer et al. (2005) point out the difficulty in presenting equally modified treatments on research since it is impossible to make dynamic and static images equally informative. Support for this view is found in a study conducted by Schnotz and Grzondziel (1996). In the study, participants were required to solve problems related to time zone differences using static and dynamic images. The study shows that those students using animated graphics answered better than those using static graphics. The researchers explain these differences stating that the dynamic graphics provided more information. These results seem to indicate that, from a L2 perspective, the most effective visual stimuli will be the one that represents more closely the world the students already know.

Further support for the use of dynamic representations when they provide more information is found in Xiao and Jones (1995). They assert the added value of using dynamic images in ESL with verbs of motion. Dynamic images can easily provide more

information than static images allowing the learner to discriminate slight differences in meaning as in the comparison between the actions *to hop*, *to walk*, or *to run*. In terms of the DCT, an animated image can provide more information that, consequently, will lead to better referential connections with the word that best defines it, ultimately resulting in better learning.

2.3.1.2. Functions of Animation

Researchers (Weiss at al., 2002; Xiao & Jones, 1995; Rieber, 1990) distinguish five functions in animation:

1. Cosmetic function: This is the type of animation used to decorate the presentation of the materials. These visuals are normally used to create an impressive opening although they hardly help in the learning process. They are mostly decorative.
2. Attention gaining function: This function has two main purposes. One is to keep students focused on the presentation. The other is to highlight the main information within the material. The main criticism of employing animation for this purpose is that once the use of this pictures becomes familiar, attention gaining effects will decrease and eventually will no longer be effective (Large, 1996). However, such an objection is hardly reason enough to dismiss the use of this tool as long as it remains effective.
3. Motivation function: This function relates to the feedback given to learners' responses. However, giving an animation as feedback does not always imply that that

reinforcement is going to be better. Special attention to the type of animation related to positive or negative feedback is especially important.

4. Presentation function: This is considered to be the best direct type of application. When a text is presented, animation helps in understanding the information, from the most specific, such as meaning of words, to the most general, such as concepts. They are more effective when they present more abstract and dynamic processes together.
5. Clarification function: This function is similar to the presentation function although animation might not provide any new information beyond the concept itself.

It is important, then, to consider this classification when designing learning materials. Designers must consider what type of function their animation fits into and how relevant and helpful it is in relation to the content.

2.3.1.3. Characteristics of Animation

Research has also focused attention on the physical properties of animation and how it can be better designed to become a more powerful teaching tool (Xiao & Jones, 1995; Weiss et al., 2002; Chang et al., 2005).

From a theoretical perspective, Weiss et al. (2002) give heightened attention to the nature of animation. On the physical level, pictures must have a certain texture, color, pixel density, and size must fit the goals of the presentation. Additionally, realism should also be considered. Whether it is a low quality or high quality image, it is important to consider specifications such as its equivalence to the real world or level of detail when

designing teaching materials and adapting them to learning objectives. Along with the consideration of the type of image used, it is important that the designer follows a certain consistency with the materials presented. Xiao and Jones (1995) differentiate between the contents of the animation that are more frequent: frame-by-frame animation and real-time animation, and both differ on the speed of the animation and the items presented. Frame-by-frame animation is a continuous flow of static images that create the illusion of movement and in which one frame is the same as the previous one except for the element that is being animated. Real-time animation is formed by frames but they are reproduced at certain speed so they show full motion as in movies.

From a more empirical perspective, Chang et al. (2005) conducted a study to measure young (ages from 5 to 7 years old) children's preferences for dynamic images. The goal of the study was to examine the effect and complexity of dynamic images and the children preferences in a multimedia learning environment. They used a picture of an apple with a face and modified it according to dynamism (completely or partially dynamic) and complexity (high, medium, or low level). Results show that the subjects preferred dynamic pictures over the partially dynamic images. In terms of complexity, subjects showed a preference for highly complex pictures over medium complex pictures, and the medium over images with low complexity. The researchers consequently conclude that these results indicate that an ideal image for computer-assisted vocabulary item learning is one with entirely dynamic effects and high complexity. However, since the subjects of the study were children and the purpose of the study is based on

preference rather than learning, this seems to be an extreme generalization. Further research on the type of dynamic image is needed.

2.3.1.4. New trend in Animation

Hegarty (2004) distinguishes two main attitudes towards animation. She explains that, early, researchers assumed that the use of animation was better and more beneficial for instruction. However, Hegarty states that empirical investigation has demostrated animation not to be as effective as it originally seemed and we cannot generalize conclusions. These days, researchers agree that the effectiveness of animation in instructional materials is inconclusive and there is a need for further investigation (Weiss et al., 2002). Notice that animation has been thoroughly studied in different situations and, therefore, it is not advisable to generalize results to other studies with different types of animation or with different content as pointed out by Hegarty (2004), and Mautone and Mayer (2001). In addition, there is a need to study not only the differences between dynamic and static images, but also between types of animations, their comparisons with dynamic displays, and the contexts of presentation as stated by Rieber and Hannafin (1988). This is important as these investigations can provide better perspectives on what type of animations to use, when, and how to use them effectively to create a better medium for learning.

2.3.2. Research on L1 and L2 Acquisition

Although the field of animation is not a new one, there is considerable disparity regarding the amount of research that has been conducted in the area of animation as related to first and the second language. Most of the studies conducted on animation in a L1 have tried to link the effects of dynamism and the understanding of complex scientific procedures (Owens & Dwyer, 2005; Mayer et al., 2005; Rieber, 1996). However, this has not been the case of L2 research which has primarily focused on the facilitation of static images in the acquisition of a second language (Deno, 1968; Dolphin, 1987; Nassaji, 2004). Later advances in technology and L1 research has raised interest in the influence that dynamism might have on SLA (Lin & Chen, 2006, 2007). In this section, I am going to review some of the most relevant studies on L1 and L2 and their use of dynamic visual aid for instructional purposes.

2.3.2.1. Research on L1

Research on dynamic visuals and learning has yielded contradictory results over which no conclusions can be drawn about the potential benefits of animation in the learning process. For example, Rieber (1990) reviews twelve studies on animation. In five of them, animation was more effective in learning. The rest of the studies showed negative or inconclusive results. In this section, I review studies that have addressed specific features of instruction related to animation.

2.3.2.1.1. Practice and Feedback

Rieber and Hannafin (1988), Rieber (1989, 1996) and Rieber, Boyce, and Assad (1990) conducted a series of experiments on the effects of animation in the instruction and learning of Newton's Laws of Motion.

Rieber and Hannafin (1988) and Rieber (1989) examine the effects of animation and practice on Computer Based Instruction (CBI) with children. Rieber and Hannafin (1988) results show that animated-orienting activities, i.e., activities showing an animation on a science concept that would be shown in a later lesson, did not have a significant difference in comparison to text-based orienting activities, i.e., those in which the learner had to read a summarizing text of the contents of a later lesson. That is, neither condition had a particularly powerful influence on learning. Rieber (1989) conducted a similar study on children and was surprised to discover that those groups with dynamic graphics, with and without text, did not perform differently than the others. He attributes these results to subjects ignoring or being distracted by the animation. This, in turn, affected the influence of the animation in understanding the text presented. Additionally, he argues that the lesson was too complex for the subjects (kindergarten students).

In contrast, Rieber, Boyce, and Assad (1990) carried out a study on undergraduate students and found some differences concerning the type of visual – animations and static images – when combined with practice. The researchers provided two type of practice: behavioral practice and cognitive practice. Behavioral practice specifically reinforced the participants after practicing while cognitive practice had the chance to control a

structured simulation. The researchers found that, unlike children, adults that worked with animated graphics but received no practice performed better than those who worked with static images or with no graphics with cognitive practice. However, when animation and practice occurred together, the results were not different than when practice was used with static representations. This suggests that animation without practice helped to construct a mental image of the processes and, consequently, that learning of a practical Newton Law occurred at certain point during the encoding process of the images[2].

These results suggest that, in a L1 environment, it is not necessary to provide animated presentations when they accompany information that is self-explanatory. Mayer (1994) brings support for these findings. In his article on the conditions under which animation becomes effective, he discusses his previous research. He states that, when a test evaluated verbatim retention and recall, subjects in the animation groups performed less satisfactorily than those with no illustrations. To explain this, Mayer (1994) affirms that his results are "consistent with the proposal that powerful effects on meaningful learning occur when visual aids provided opportunities that otherwise would not be available for constructing a visual model of the system and connecting that visual model to corresponding verbal representations" (p. 132).

[2] Positive results were found in Rieber (1996). He conducted two experiments on the effects of acceleration and velocity with an alternative game-based measurement. Results of the first experiment showed that the "game" scores were higher when they received automatic graphical feedback through animation. The second experiment was modified increasing the number of trials when interacting with the game. Subjects presented with some sort of animated graphic, with or without text, performed better than the subjects with only text in the test score.

2.3.2.1.2. Narration versus Text Information Presentation

Another area of research has focused attention on the effect of the presentation of visual and aural information together with animation.

Mayer and Moreno (1998) conducted two science experiments on college students, one on cloud formation and the other on a car braking system. Following the Dual Processing theory with split-attention effects, the authors studied narration effects on learning in contrast to text effects. This dual processing theory states that visual information is stored in visual working memory while auditory information is kept in auditory working memory. The implication of the dual processing theory is that when students are presented with images and text at the same time, it results on an overload of the visual working memory. In contrast, when animation is presented with an aural narration, the information is split between both working memory systems and, as a result, performance improves, as predicted by Mayer and Moreno (1998). Researcher found that students presented with animation and narration outperformed those presented with animation and text on recall, matching, and transfer tests. However, I believe that while texts can be revised to draw attention to more specific information, narrations are more difficult to review, especially when students are exposed to a second language.

The use of text or aural information seems to have no effect in L1 whether the graphical representation is static or animated. Mayer et al. (2005) conducted four experiments to study the differences between the effects of static images with printed text as compared to a computer-based animation with narration. They used four experiments based on the topics of lighting formation, the workings of a toilet tank, the formation of

waves, and the braking system of a car. Each experiment was tested by a retention test and a transfer test. These four experiments showed that in four out of eight tests' results, static images and text were more efficient than animation with narration. The other four results were inconclusive showing no benefit to any of the groups. However, Mayer et al. (2005) explain these results arguing that subjects had more control over the learning materials in the paper-based treatment than in the computer-based one. Also, the computer-based treatment lacks the cognitive processing needed to achieve apprehension and, therefore, they suggested the use of practice. In a similar study, Wilson and Dwyer (2001) examined the correlation between an aural narration to static and dynamic representations using the functioning of the heart as the topic. Results revealed no significant differences in relation to the visual representations. These authors suggest that these findings may be a result of the type of visualization employed, i.e., dynamism impeded information processing. In contrast, Lai (2000) conducted an experiment on abstract programming languages using three subject groups: (i) text and audio, (ii) text, audio, and static images, and (iii) text, audio and dynamic images. She found that narration, together with animation, was more efficient than narration and static representations when learning abstract concepts. Lai (2002) explains that when narration was used with animation, participants paid more attention to the dynamic illustration and also established strong connections between the concept and the illustration.

The studies reviewed point to the effects of the type of presentation, i.e., aural, visual, text, etc, on the cognitive processes required for learning to occur. Mayer et al. (2005) states that there are three types of processing information that can affect attention:

extraneous processing, intrinsic processing, and germane processing. Extraneous processes are those cognitive processes used to understand the objective of the instruction. Intrinsic processes are those used to attend to key material. Finally, germane processes are those used to organize and map the information in relation to prior knowledge. Attention is affected depending by the cognitive processes the students use while instruction takes place. Consequently, the cognitive load affects the amount of attention students can engage in when learning new material. Accordingly, narrated animation in L1 may be more beneficial to learning since it involves less cognitive processing as the animated images provide sufficient information. However, students need to work cognitively to reach deeper learning (Mayer et al., 2005). Nonetheless, practice in a learning environment would provide the germane processing necessary for this deeper storage of the information provided (Rieber, Boyce, & Assad, 1990).

2.3.2.1.3. Cueing

One of the main issues concerning multimedia design is the need to direct attention to the target information, i.e., cueing. There is a need to calibrate and equalize the amount of attention in terms of cognitive processes when presenting subjects with animated and non-animated information.

Mautone and Mayer (2001) investigated the effects of what the researchers call *cueing* or *signaling* in relation to animated visual aids. Cueing, in this study, were considered as a cognitive guide to promote students' understanding of the presented materials. Among those signals, Mautone and Mayer (2001) distinguished three types:

(a) titles and headings, (b) function and relevance indicators (e.g. *thus*, *in summary*, or *it's important*), and (c) typographical indicators (i.e., bolding, italics, or colored text) that focused attention on specific words making them distinguishable from other words on the text.

Mautone and Mayer (2001) conducted three experiments. In the first experiment they studied the effects of cueing on paper on college students. They found that, although there was no statistical difference on retention of information, signaling had an effect on the transfer test, i.e., when students had to apply the learned material to problem-solving questions. The second experiment showed that signaling aurally had a significant effect on retention and transfer. In the third experiment, researchers signaled the animation through coloring, arrows, and icons. The results showed that there were no significant differences between signaled and non-signaled animations used with signaled and non-signaled narration. Researchers present three possible explanations for this lack of effect: (a) weakness of treatment on signaling the animation, (b) the complexity of the animation making narration alone sufficient, and (c) the ability of the students to take better cues from text than pictures. They also provided other explanations related to the participants' ability to use their own processing strategies on the presented information.

Owens and Dwyer (2005) studied the effect of cueing strategies in animation alone. In their study, the researchers did not find any significant difference between the three treatment groups – animation, animation with attention-directing strategies (i.e., the animation colored and moved to capture the viewer attention), and animation with visual-elaborating strategies (i.e., the animation lacked information that a static representation

appearing in the same screen had, so participants had to refer back and forth to both visuals). The researchers point out that cueing strategies did not affect learning was because of the powerful attraction that animation had in the materials used. In other words, subjects in the study spent more time attending to the animation than working with the accompanying text.

Later, Zhu and Grabowski (2006) replicated Owens and Dwyer's (2005) experiment adding cueing strategies not only to the animation but also the accompanying text. Text animation was introduced as pop-up text that specifically showed the most relevant information for each presentation. After four different post-tests, results demonstrated that there was no difference between students presented with or without animation.

However, it is important to note that these studies based on Dwyer's study of the functioning of the heart (Owens & Dwyer, 2005; Zhu & Grabowski, 2006) were conducted in one session. I would like to point out that the short amount of time given to process the large amount of information presented might have had a negative effect in their results. Also, students' interest in the subject matter could have a significant influence on retention.

Mayer and Moreno (2002) provide an explanation to these results under their dual-processing model and a redundancy principle. The dual-processing model argues that the working memory is split into a visual and an acoustic system. The redundancy principle states that, in L1, it is more effective to present animation and narration only rather than animation, narration, and on screen-text. Therefore, providing too much information in one system – rather the visual or the acoustic – may have overloading consequences. I

will discuss later how this principle may not have the same effects on L2 instruction (Nassaji, 2004).

2.3.2.2. Research with graphical representations in L2

Animation has also been the subject of considerable interest in Second Language Acquisition. Although research is not as robust in the area of static graphics versus animated graphics (Lin & Chen, 2006, 2007), there are several studies on the role that animation plays in acquiring a second language (Finkbeiner, Nicol, Greth, & Nakamura, 2002; Kuo & Hooper, 2004; Sun & Dong, 2004). It is generally believed that animation can benefit the acquisition of a second language although it effectiveness has been relegated to the categories of phonetics, action verbs and culture (Xiao & Jones, 1995).

2.3.2.2.1. Research with Static Images

Using visual aids in teaching and learning foreign languages has been proved to be a beneficial advantage. Deno (1968) found that individuals learn better from pictures and words pairs than from word and word pairs when presented with similar concepts. Scholars such as Dolphin (1987) defend the use of visuals to promote vocabulary acquisition and comprehension. Among other stimuli, still images can be used to reinforce vocabulary, provoke oral expression, improve aural comprehension, and even show cultural differences. Also, Dolphin (1987) advocates for the use of still images over moving pictures since they are cheaper and one can work more extensively with

them. However, new trends in technology are providing new paths for inserting animations more efficiently into classroom materials.

In contrast to the split-attention effect (Mayer and Moreno, 1998), and the redundancy principle (Moreno and Mayer, 2002), Nassaji (2004) found positive effects using visual graphics when combined with aural and written made-up words. He presented color pictures of recognizable objects together with (a) written word only, (b) aural word only, and (c) mixed written and aural word. The researcher concluded that subjects benefited the most from presentations that joined word and aural information with the visual stimuli.

However, other studies conducted with other types of static pictorial representations proved to have opposite results. Morimoto and Loewen (2007) studied the learning progress of Japanese high school students of English as a Second Language. In their study, one group of participants was taught with Image-Schema-Based Instructing (ISBI) materials and the other group with Translation-Based Instruction (TBI). Results of the study showed both treatments to be equally effective in all judgment posttests with the exception of one[3] in which the ISBI treatment was shown to be more efficient. Kuo and Hooper (2004) studied the effects of self-generated visual mnemonics in relation to Paivio's (1971, 2007) DCT in students learning Chinese as an L2. Self-generated visual mnemonics used in this experiment are memory aids created by the student, e.g. the rhyme of two words or linking an image and a word, that relate common features between a target word and a picture. The researchers found out that learning vocabulary

[3] This was an acceptability judgment test in which the participant had to read thirty sentences containing the target word and judge if they were semantically appropriate or not.

using self-generated cognitive strategies, such as creating links between the word and the image, is more effective than presenting the student with given mnemonics. It was also interesting that these students used mnemonics from their own country. For example, to learn the symbols for *door*, they used the mnemonic of western doors, which were closely related in form. Hence, it is important to first ascertain whether or not the graphical representations used in relation to the target culture is meaningful to the students taught. Second, materials must offer cognitive relations within coded information so information is learned.

2.3.2.2.2. The Use of Advance Organizers in Video and Animation

We should remember that video materials supporting specific course content were the first type of animation implemented into the L2 classroom. Kauffman (1996) points out the importance of video contextualization. He argues that just as students receive introductory information before they travel to a foreign country, the same must be done when presenting them with cultural material. Herron (1994) and Herron, York, Cole, & Linden (1998) conducted experiments on the introduction to video through advance organizers (i.e., introductory information). They found that their use leads to a better understanding of the visual materials showed. In summary, it has been demonstrated that when using any sort of animated visuals, it is better to use introductory information that prepare learners to the information that is going to be presented.

Due to the resemblance between video and animation, as pointed out by Xiao and Jones (1995)[4], it is very difficult to establish the boundaries that separate video with these representations. This is another reason why the use of advance organizers in animation is advantageous. Sun and Dong (2004) studied vocabulary learning of English as a Second Language in Chinese children. Content was based on an animation-based context and the results demonstrated that animation was less effective in learning L2 vocabulary when there was no learning support. These results have two important implications for vocabulary teaching. The first one is that before presenting animated information, the students should be properly informed about what they are going to see in the animation. The second is that the teacher is still needed in the learning environment to prepare the students before showing the visual representation[5].

2.3.2.2.3. Research on Animation

There is less research on the application of animation in L2 than in L1 in terms of the effects of animation in comparison to static visual stimuli. Lin and Chen (2007) postulate that although the use of animated materials has been practically researched n second language acquisition, "few studies have compared the learning effects of static and dynamic visuals, as well as strategies embedded to foster learning from animation in a foreign language context" (p. 86). They only identify one study by Xiao and Jones (1995) which suggests that animation is recommended to be used in L2 to teach phonetics, action verbs, and culture.

[4] See page 9 for differences between how static and animated visuals are built.
[5] See also Mayer at al. (2005).

Very few studies on animation and its effects on L2 can be found and few have been able to identify principles for the design of foreign language materials. Lin and Chen (2006, 2007) investigated the use of animation and advance organizers in reading authentic English as Foreign Language (EFL) texts. Results from their experiment show that there was no difference in posttests' performance between the group that used animation and the no animation group. However, advance organizers proved to have a significant effect on language learning between the animation and no animation groups.

It is important to note that the study conducted by Lin and Chen (2007) in L2 was a modified version of that conducted in L1 by Wilson and Dwyer (2001), Owens and Dwyer (2005), and Zhu and Grabowski (2006) on the functioning of the heart. Modifications consisted of time and situational training. The researchers divided the study into two days. They provided simplified texts and word banks to students during the first day based on considerations of difficulty of content material difficulty. The second day was used to conduct the study. This raises some concerns about the results. The researchers stated that there were limitations concerning time constraints, i.e., students presented with animation and question advance organizers had more exposure to the materials than those presented with static representations.

Verhallen, Bus, and Jong (2006) also compared the use of animated features in storytelling. They exposed five-year-old, at risk, immigrant children to a storybook with dynamic and static visuals. After several encounters with this material, both groups benefited learning the target language. However, those subjects in the animated graphic groups benefited the most. This experiment seems to support to two aspects considered

in the present study. First, the number of encounters has a positive effect on learning. Second, under certain conditions, animation, compared to static graphics, is a more powerful tool to SLA.

2.3.2.2.4. Other Uses of Animation in L2 Research

Other L2 studies have investigated the influence of annotations and feedback and animation (Hew & Ohki, 2004), classroom roles (Sun & Dong, 2004), the implications of using self-generated or given mnemonics (Kuo & Hooper, 2004), and the conceptualization of verbs (Finkbeiner et al., 2002)

Hew and Ohki (2004) studied the use of animation as annotations and feedback on the acquisition of Japanese sounds by Malaysian students. Annotations were presented as symbols designed to help the students to distinguish low pitch, high pitch, voiceless, voiced and explosive sounds, short and long vowels, and single and geminate consonants. Feedback was presented by showing a native speaker demonstration of the sounds in comparison to the student production. Results of their study showed that those students that received animated instruction performed better than students that only received audio and text.

Consistent with the cultural selection of animated stimuli and its relation to language, Finkbeiner et al. (2002) studied the conceptualization of an animation showing manner (e.g. a ball rotating in place) and motion (e.g. a ball moving towards a target) verbs in English, Spanish, and Japanese students. Results showed that English speakers pointed to the animation showing manner more than Spanish and Japanese did. Participants may

have used of their native languages to better remember and process the visual information. In other words, they related the visual and linguistic information as stated by the DCT (Paivio, 1971).

CHAPTER THREE

METHODOLOGY

3.1. Data Collection

Three sets of data were collected through a short-term and a long-term posttest, administered to twenty-two sections of second semester of the first year Spanish at Auburn University. All procedures were applied uniformly to each group, with the exception of varying instructors. Instructors formally informed the participants that an study was going to be conducted in the class and it would not affect their grades. Data were collected through class participation and from activities originally planned as part of the class. The study was of no cost for the participants, and they did not receive any monetary incentive for their participation.

Responses were collected from the different class sections under the participants' names in order to facilitate data gathering. However, the database was organized under two digit numerical code to maintain anonymity of the participants. Data were stored in the researcher's office and only he had access to the materials. The researcher's advisor also had temporary access to the data for guidance purposes.

3.1.1. Setting

The study was conducted in the Department of Foreign Languages and Literatures at Auburn University, Alabama during spring semester 2008 with the permission of the Department Chairperson and the Institutional Review Board for the Protection of Human Subjects Research (IRB). This place was selected by the researcher since he is a graduate student in Auburn and works as a Spanish graduate teaching assistant.

All twenty-two sections in the second semester of beginner Spanish were included in the study. Instructors involved in the study had at least two semesters of teaching experience at the university level. The study was conducted over three fifty minutes class periods as part of the class. In addition, participants completed lab work outside the classroom with multimedia instructional materials online within the Quia platform. However, this component was not part of the study but a regular part of the Spanish first year course.

3.1.2. Subjects

Participants were English-speaking, undergraduate students enrolled in a required second semester Elementary Spanish class (N=511). Only those participants that attended all classes pertaining to the study were included (N=199). Furthermore, the participants were given the choice to sign a consent form to authorize the use of the data in the analysis of the study. Out of a total of 199 participants, those who signed the consent form were included in the study (N=166). Finally, the researcher excluded the

participants that were part of his own sections in order to avoid any biases. Hence, the total number of participants included in the study after filtering all subjects was N=149.

Course sections were divided into four different treatment conditions: static visual and no cueing (Control Group), static visual and cueing (Group A), animation and no cueing (Group B), and animation and cueing (Group C)[6].

Originally, treatment assignment in each of the four treatment groups was randomly chosen to maintain an initial equal number of subjects in each group. However, after the criteria for subject selection were applied, the number of participants in each group was not identical. Control Group had a total number of thirty-seven participants; Group A had thirty-eight participants; Group B had twenty-nine participants; and Group C had forty-five participants.

A total of ten instructors were responsible for teaching the twenty-two sections of elementary Spanish. Six of the teachers were instructors in the department and four were experienced teaching assistants. Six of the instructors were native speakers of Spanish and four were English speakers with near-native proficiency in Spanish. All teachers belonged to the Department of Foreign Languages and Literatures at Auburn University, were trained in the communicative method, and had experience with Computer Assisted Language Learning (CALL) in the classroom.

[6] See next section for conditions.

3.1.3. The Conditions

Two conditions were used in the present study: animation versus static pictures and cueing versus absence of cueing. These two conditions were crossed to study the implications that they had with each other.

3.1.3.1. Animated versus Static pictures

In order to study the implications of movement in the acquisition of Spanish vocabulary, participants were presented with both animated and static images. The goal of the researcher was to identify the effect of movement presented as visual stimuli in the Spanish acquisition. Research regarding the use of animation has mainly been conducted in L1 and results have been inconclusive. By adding this condition, this study might shed some light on the use of animated and static images in the field of Spanish L2 vocabulary acquisition.

3.1.3.2. Use of Cueing versus Absence of Cueing

A second condition used in the study was the use of cueing strategies for the clarification of the target Spanish vocabulary taught. Cueing consisted on adding a red flashing highlighted color around the target word. It has been shown that pictures are better retained than words (Kobayashi, 1986). Therefore, when presenting L2 Spanish vocabulary in the classroom accompanied by visual stimuli, instructors must be careful about which is the relevant information we want the students to acquire. For example, in

the acquisition of vocabulary the word itself must be the target with the visual stimuli only serving as a support to understand the real representation of the word introduced.

3.2. The Materials

3.2.1. Vocabulary

The initial target words for the study were selected from the vocabulary list of the *Dos Mundos: Comunicación y Comunidad* textbook (Terrell, Andrade, Egasse, & Muñoz, 2006) and all belong to the noun category since they were more easily conceptualized through pictures. Some additional words not included in the book wordlist were also added to supplement the available nouns of the chapter.

Due to the importance of the relation between words and images in this study, words were selected according to the representational value of the pictures illustrating the words. From a set of thirty-nine initial words, only seven – *enfermera* 'nurse,' *cirujano* 'surgeon,', *veneno* 'poison,', *embarazada* 'pregnant woman,', *silla de ruedas* 'wheelchair,', *fonendo* 'sthetoscope,' and *pastilla* 'pill' – were finally selected on the basis of their clarity and representational value.

	Static pretest	Dynamic pretest
Pastilla	94.4%	97.8%
Embarazada	83.3%	91.3%
Silla de ruedas	97.2%	97.8%
Fonendo	83.3%	82.6%
Veneno	86.1%	93.4%
Cirujano	86.1%	91.3%
Enfermera	97.2%	93.5%

Table 1. Total percentage of image-word relation in the pilot study.

In order to know which set of words were easier to identify by the participants, a pilot study was conducted in four sections of the first semester of elementary Spanish level at Auburn University. Participants in this test were shown a set of thirty-nine pictures. After each picture, they were asked to write in English on a piece of paper what they thought the visual on the screen represented. Thirty-six participants were tested with static visual stimuli and forty-six with animated visual stimuli. The images whose answers matched both the native language and the correspondent translation in Spanish were selected. This was done to assure the validity of the images used, i.e., the selected images were interpreted by the students as representation of the vocabulary words to be used in the study.

3.2.2. Animation

Animated visual stimuli were initially obtained from the website *www.animationfactory.com* and then were modified by the researcher with Macromedia Flash 8 to assure the uniformity of their characteristics. For example, the image representing the surgeon had longer pauses in its movement than the image representing the nurse. Therefore, the researcher decreased the time span of the pauses in the surgeon image. The movement shown consisted of a set of frames that played continuously to give a sense of movement. The animations were short movie clips showing an item conceptualizing a Spanish vocabulary word. Each image was continuously repeated while the target vocabulary was presented. Moreover, static pictures were obtained from the corresponding animated picture by selecting a single-framed image that was as

representative as the animated picture. The representativeness of each pair of images, i.e., static and animated, was tested in the pretest.

However, to prevent participants from only focusing on the target animations and vocabulary presented in the instruction period, pictures and words were also included in the lesson plan.

3.2.3. Cueing

All target words were cued the exact number of times during the study. The researcher used two techniques for cueing the words of the study. This was done with two different purposes. First, all words linked to a visual stimuli were bolded and marked in dark red in order to indicate to individual instructors which words were linked to images. When the instructors clicked on those words, the corresponding image appeared in the lower part of the screen. Also, these bolded words had the goal of directing attention purpose. In other words, bolded words might have an indirect effect of indicating which words were related to the topic of study.

Secondly, only the seven target words studied were cued in the materials in specifically targeted sections of the instruction. When the participants were presented with the target Spanish vocabulary words and their visual stimuli in the vocabulary section, words were cued with red flashing around the word in the cued condition groups. This flashing was repeated three times until it disappeared and the word and image remained until the end of its presentation. For those groups under the no-cueing condition, no flashing appeared around the target vocabulary word in the presentation.

3.2.4. Lesson Plan

To maintain consistency of materials used by instructors, the researcher created a set of computer-based instructional materials with modifications of the two existing conditions. These materials were created with Macromedia Flash 8 and consisted of an upper menu with four lessons, each containing the materials and activities used in class each day of instruction. Each lesson had an introduction section, a vocabulary section, and a set of three to four practice activities. In addition, each lesson included extra activities that did not contain the target vocabulary words to assure that instructors had enough materials for the entire class period. Each activity was divided into presentation, activity, and feedback-reinforcement.

The materials were presented in class as part of instruction with a computer and a projector. All students in class had visual access through a white screen in the front part of the class where the lessons were projected. Participants in the study could ask their instructor to navigate through the materials, moving forward and backwards if they had questions or needed to clarify content.

3.3. Procedures

3.3.1. Pre-Questionnaire

Stated by Mayer et al. (2005), prior knowledge of the contents of study is crucial for learning. The first step in the study was to measure how many of the target words the students knew. Instructors gave participants the first questionnaire in the form of a test in which they had to write the English translation of the Spanish word given. The test

contained a total of twenty-one words related to the topic of health. Included in the list, there were some words related to previous course materials. This questionnaire-test was used to measure previous knowledge on the target vocabulary.

3.3.2. Day One

The first day of instruction included the following materials: introduction to the topic, vocabulary, four activities, and additional activities to supplement the class. None of the materials used during the first day of instruction contained any of the target words of the study. Rather, this first section was to familiarize the instructors and students with the format of the new materials. However, students were exposed dynamism through previous class activities.

The introduction part of the lesson consisted of a review of previous vocabulary words learned in the first semester of instruction, e.g. body parts. All participants were expected to know this vocabulary. A set of five animated and static images were used to present the vocabulary and participants had to tell the instructor which parts of the body they could relate to the pictures.

The vocabulary section introduced static images representing new vocabulary on the parts of the human body. These images and the vocabulary were taken from the *Dos Mundos: Comunicación y Comunidad* textbook (Terrell et al., 2006). The students could refer to the book and tell the instructor which parts of the body they could identify. When the participants produced the vocabulary words, the instructor clicked in the

corresponding part of the body and the written word appeared in a box next to the picture. This vocabulary section consisted on five images and forty-five words in Spanish.

Activity one was used to link the parts of the body with an action in which those parts were involved. First, the instructors presented the parts of the body by clicking on them, e.g. *boca* 'mouth,' *ojos* 'eyes,' and *piernas* 'legs,' and showing the correspondent static or dynamic image. Then, the students were asked to work in groups and link the parts of the body with their corresponding action, e.g. *los ojos se usan para mirar* '*eyes are used to look'*. Finally, participants gave the correct answer to the instructor and the instructor dragged and linked the vocabulary word to the corresponding verb.

Activity Two covered the skills of recognition and spelling. A definition of a vocabulary word was first introduced along with three images, static or dynamic, to choose from. The definition was read and participants were asked to select an image and spell the vocabulary word related to it. Eight sets were presented in this activity.

Activity Three was divided in two parts. The first part was an introduction to the verb *haber*, '*there is/there are*,' in Spanish with corresponding examples of its use. After the presentation, participants were asked to form groups and complete a text with the corresponding form of the verb *haber*. Four words in the text were linked to a corresponding image that the instructor showed when the word was introduced.

Activity Four practiced the reading comprehension skill. The instructor introduced a set of four short paragraphs and the participants were asked to read them. Some words were linked to corresponding images and the instructor showed them when the word was produced. After reading the short paragraphs, the entire text appeared together with a set

of five questions. In order to measure reading comprehension, participants were encouraged to answer.

Additional activities consisted in the presentation of sayings in Spanish with the corresponding English translation and an interview activity in which the students had to ask their partners given questions showed in the screen. However, none of the four groups of the study covered this section of the lesson given time concerns

3.3.3. Day Two

The second day of instruction was conducted two days after the first lesson. This was the first time the participants were presented the target words of the study. It included an introductory section, a vocabulary presentation, three practice activities, and additional activities. In addition, instructors assigned homework for the following day.

The introduction to the second lesson reviewed vocabulary learned in the previous lesson consisting of nine words. Like in the first lesson, an animated or static image was introduced and the participants had to tell the instructor the word linked to the image given.

The vocabulary was introduced in two different parts. In the first part, the participants were asked to listen to an audio recording and look at the screen. Before playing the audio, they received instructions as an advance organizer. While the audio played, target words were presented along with the corresponding image. Images were presented in either animated or static forms and words accompanying the images were cued or not depending on the treatment of the study. All seven target words of the study

were presented in this section. In the second part of the presentation, the audio script was projected after listening to the audio. Additionally, words were linked to a corresponding static or dynamic image that appeared in a content box under the text. Finally, participants were asked a set of six questions to measure their understanding of the materials presented and to produce the target vocabulary of the study.

After presenting the vocabulary, subjects worked with activities. The first activity developed the speaking skill. Students were given four situations and they had to complete the sentence with different options. Words were linked to corresponding dynamic or static images in order to facilitate understanding and reviewing of the material. Next, participants were asked to change roles and ask their instructors what they did in certain circumstances.

The second activity was a role play activity. Instructors asked the participants to work in pairs, one being a doctor and the other the patient. The patient reported a symptom to the doctor and the doctor gave a recommendation to the patient. Both the situation and the answers were given although the participants playing doctor had the option of open-ended answers. After completion, the instructor corrected the activity with the answers of the participants. Then, participants changed roles and another five situations were presented.

Activity three also was divided in two parts: a grammar presentation and a practical activity based on the grammar contents and vocabulary. The first part presented the use of the Spanish reflexive verbs to express 'to become' and 'to get' – *volverse*, *hacerse*, and *ponerse* plus an adjective or noun to express changes in state. After the quick

grammar presentation, the students were asked to work in groups and interview each other with a set of five questions provided by the instructor. These questions included target words of the study as well as non-target words. After talking to each other, the instructor asked participants the questions they have previously practiced.

An additional activity was included. It consisted on a written activity in which the participants had to write sentences using a set of six images given. Each image was linked to a word related to the chapter. However, due to time constraints, none of the groups covered this activity.

Finally, participants were given homework due the following day of instruction in which they had to write a paragraph on a topic related to the content of the study.

3.3.4. Day Three

During the third day of instruction, the lesson plan was structured as follows: an introduction, vocabulary, a set of three practice activities, and additional activities.

The introduction section of the third lesson consisted on a review of the material studied until that moment. As in other reviews, the participants were exposed to a set of seven animated or static images related to the vocabulary of the chapter studied and they had to tell the instructor what they saw in the images. However, none of them belonged to the target vocabulary of the study. A box next to the image showed the word related although the participants were encouraged to answer other possible words.

Vocabulary was introduced as in day two. Participants listened to an audio recording while they were shown an image and a word. Animated and static images were crossed

with cued and non-cued words. Only two target words were presented in this first part of this section – *enfermera* 'nurse,' and *cirujano* 'surgeon'. After the audio presentation with their corresponding pictures and words, participants listened a second time to the audio with the audio script projected. Two other target words were bolded in red and linked to the corresponding animated or static image. Finally, a third part in the vocabulary section presented questions that the participants used to speak with their partners. After participants asked the questions to each other, the instructor interacted with them to reproduce what they practiced with their partners.

The practice section started with a first vocabulary activity. The participants were exposed to seven blurry animated or static images that progressively became clearer. The objective of the activity was to make the participants guess what the image showed before the image became completely clear. Vocabulary production was free until the word was produced. Every time a student was willing to guess what the image represented, the instructor stopped its progression towards clarity.

The second practice activity presented three verbs that introduce the present tense of the subjunctive mood and used indirect objects before the verb (*aconsejar* 'to advice,' *decir* 'to say,' *pedir* 'to ask for,' *recomendar* 'to recomend'). After a brief introduction, participants had to practice the new structure with a practice activity. The activity presented six sentences with a command that the participants had to transform into a subjunctive structure. Two target words in the study were cued in this activity (*veneno* 'poison' and *silla de ruedas* 'wheelchair').

Next, a third activity introduced the practice of the speaking skill. It was based on a signature activity, i.e., an activity that involved participants in looking for classmates who had performed any of the given statements. They asked their classmates and if they received a positive answer, they wrote the name of the other participant. Later, the instructor asked the participants who they talked to and what other extra information they can produce.

Finally, additional activities consisted of a review of what was studied in previous lessons in the chapter, a vocabulary review, and a written activity. In the first part, participants told the instructor what vocabulary and grammar was covered in the chapter. In the second part, in the vocabulary review, instructors showed ten animated and static images and the participants again had to produce what they saw. Finally, six animated or static images were shown and participants wrote a small story including the vocabulary related to those images. Due to time constrains, none of these activities were carried out.

3.3.5. Day Four and Short-term Posttest

The last day of instruction was used to conduct the short-term posttest. The tests were covered the materials used in the four days of instruction. The whole lesson contained an introduction to the day, a recall test, a grammar and vocabulary presentation, three practice activities. One of the practice activities included the recognition test. Finally, additional activity to make sure instructors had enough materials to fill the entire class period.

The lesson started with a short introduction on the guidelines for the composition due the next day of class. Immediately, students were given a recall test consisting of ten animated or static images and were asked to write the words related to them according to previous instruction. They were given enough time until all participants were finished.

Next, class continued with a grammar and vocabulary presentation. No materials related to the study were presented in this section but they were introduced to create unity along the whole lesson plan and period of instruction.

The first practice activity was an interview. Participants were presented four questions to ask to their partners. The activity contained four bolded words linked to animated or static images that appeared in a square after clicking on the word. None of these words were target words for the study. Once participants finished talking to each other, instructors asked them what they discussed with their partners and then clarified any questions.

The second activity was used as a second short-term posttest intended to measure recognition. A fill-in the blank test was presented on the screen. The instructor read the text until reaching a blank. Then, when the instructor clicked on the blank, an image and three possible words showed. Participants were then prompted to recognize the correct word by selecting the correct answer in a multiple choice format. The posttest was comprised of a set of thirteen questions. After the posttest was completed, instructors collected the responses and gave them to the researcher.

Next, a listening activity was conducted. Participants listened to audio recording and organized a set of images in chronological order in relation to the audio recording. Also,

another activity was provided to fill the time of the class if needed; however, none of the instructors used it in their teaching. It consisted of given situations that participants had to use to write a short paragraph according to the given situations. However, due to time constraints, none of the instructors used the second written activity.

3.3.6. Long-term Posttest

Thirty-six days after the short-term posttest, participants completed another test to assess long-term recall and recognition. They were asked to complete two modified tests similar to those given in the short-term one.

The first test was a recall test. Participants were presented with ten images, animated or static depending on the group, and then they were asked to write on a paper the word related to the images. Seven of the ten images were target words on the study.

Immediately after the first test, instructors presented a second test to measure recognition with the same format as the short-term posttest. The activity contained a fill-in the blank paragraph read aloud by the instructor. Before each blank, the instructor stopped and introduced an image with three possible multiple choice answers. Students were asked to select A, B, or C according to the text and image shown.

3.4. Data Analysis

3.4.1. Variables

Four variables can be identified in the study concerning the instructors, the classes where instruction occurred, the participants' individual learning styles, and their varying levels of motivation.

CHAPTER FOUR

RESULTS

4.1. Dynamism in a Short-Term Period

The researcher conducted two short-term posttests in order to measure participants' performance. They consisted of recall and recognition posttests. In the recall posttest, participants were presented a total of ten dynamic or static images, both target and not target words, and they had to write the vocabulary word that referred to the picture. The recognition posttest presented a short paragraph in a fill-in-the-blanks format. Each blank introduced a static or dynamic image depending on the group condition and three words in a multiple choice format. Both recall and recognition short-term posttests were conducted the last day of instruction.

The recall short-term posttest was analyzed by the researcher in two different ways to measure both the influence of dynamism and its effectiveness in performance. On the one hand, the results on influence were obtained by calculating the percentages on the words produced exactly or similarly to the target word. However, if the word similar to the target word was another existing word in English or Spanish, the word was considered wrong, i.e., if they produced *enferma*, 'sick,' for *enfermera*, 'nurse,' the first was graded wrong. As Nation (1990, 2001) states, knowing a word is not only a matter of knowing the form. Therefore, the researcher estimates that words were not expected to

be perfectly produced and that this analysis might provide a general idea on the influence of visual stimuli on the vocabulary learning process.

The criteria used to evaluate if a produced word was similar are the following:

i. A vowel or consonant was missing in the written word, e.g. *embrazada* for *embarazada*, 'pregnant woman.'
ii. More than 50% of the letters are present in the word although in an incorrect order, e.g. *cirjeon* for *cirujano* 'surgeon.'
iii. All words of a compound noun were right except for one that started with the same letter than the target word, e.g. *silla de ruella* for *silla de ruedas*, 'wheelchair.'

On the other hand, performance was analyzed by counting as correct only those words that were produced target-like. All other words that were similar were rejected as incorrect. The researcher considers that this analysis would show the results of how dynamic and static images can affect vocabulary acquisition.

Dynamic and static images in the recall posttest were first analyzed in terms of the influence of images in vocabulary acquisition. The comparison of the means of the groups treated with dynamic or static images showed that participants exposed to dynamic material performed better than those presented with static material (means=40.05% and 33.11% respectively). To measure if this difference was significant, the researcher used a univariate analysis of variance with a significance at p=.05. Results

showed that there was no statistical significant differences between groups treated with dynamic or static images (p=.085).

Participants' performance when producing the precise target word was also analyzed. The comparison of the means of both dynamic and static groups revealed that the dynamic groups performed better than the groups presented with static images. However, both dynamic and static percentages were lower than expected (means=25.81% and 19.23% respectively). The researcher analyzed the statistical significance of dynamism in this posttest with a univariate analysis of variance with significance at a p=.05. In this analysis, dynamism was statistically significant to provide better results than static images (p=.05).

Condition	Means in short-term posttests		
	Recall (influence)	Recall (precision)	Recognition
Dynamic	40.05%	25.81%	93.43%
Static	33.11%	19.23%	95.61%

Table 2. Dynamic and static means in short-term period

In the short-term recognition posttest, the mean for each condition shows that the groups that used dynamic images in the class materials performed slightly worst (mean=93.4%) than the groups with static images (mean=95.61%). With the purpose of finding the statistical significance of these results, a univariate analysis of variance was conducted with a significance at p=.05. Results showed that there was no difference between the use of dynamic and static images between groups (p=.151). Both groups using dynamic and static images performed better in the recognition immediate posttest

than in the recall posttest. This is not surprising as the test format used for recognition provided all the needed information to participants, i.e., the picture, the possible words, and the context.

4.2. Dynamism in a Long-Term Period

In order to measure the influence of dynamic and static images in the acquisition of vocabulary in a long-term period, the researcher used the same test format of test as in the short-term period, i.e., a recall and recognition posttests. The recall long-term test was exactly the same than the short-term. A set of ten dynamic or static images containing the target words were presented and the participants had to write down the word associated to the images. In the case, the recognition long-term posttest presented a short paragraph with a fill-in-the-blanks format where each blank presented a dynamic or static image with three possible words in a multiple choice format. Participants had to mark their answers in a piece of paper that was collected by their instructor. Both long-term posttests were conducted thirty-six days after instruction.

As in the short-term posttest, the recall test was analyzed in two different ways to differentiate between the influence of dynamism and its effect on performance.

Condition	Means in long-term posttests		
	Recall (influence)	Recall (precision)	Recognition
Dynamic	40.35%	25.99%	95.03%
Static	47.93%	36.85%	91.38%

Table 3. Dynamic and static means in long-term period

In the long-term recall posttest that measured the influence of visuals in vocabulary acquisition, the group presented with static images performed better (mean=47.93%) than the dynamic group (mean=40.35%). These results are opposed to those found in the same test in the short-term period. Also, both groups performed higher than in the post-test. This difference in the performance might have been caused by the effect of an exam that took placed in between both short-term and long-term posttests. The repercussion of this exam on the results will be discussed in the next section. Statistical significance was measured with a univariate analysis of variance with a significance set at p=.05. The researcher again found no significant difference between groups exposed to dynamic or static images in this test (p=.116).

The long-term recall posttest that measured precise production resulted in better performance of the groups presented static images than the groups presented with dynamic images. The dynamic group had a mean = 25.99% and the static group had a mean = 36.85%. A univariate analysis of variance was used to measure the statistical significance of the findings set at p=.05. Results in this test show a significant difference in both groups with the outperformance of the static group over the dynamic group (p=.010).

Finally, means in the long-term recognition posttest revealed that both dynamic images (mean=95.03%) and static images (mean=91.38%) had a positive effect on the recognition of the vocabulary, dynamic visuals yielding slightly superior results. A univariate analysis of variance was used to examine the statistical significance of the

results set at p=.05. Results showed that there was no significant difference between dynamic and static images (p=.93).

4.3. Cueing in Short-Term Period

The effects of cueing when accompanying dynamic or static images in the recognition and recall of L2 Spanish vocabulary were also measured through posttests conducted at the end of instruction. On the one hand, the recall posttest showed a total of ten dynamic or static pictures containing the target words for the study. Participants had to write down in a piece of paper the vocabulary word related to each of those pictures. On the other hand, the recognition short-term posttest introduces a short paragraph in a fill in the blank format. Each blank showed a dynamic or static picture and a set of three words in a multiple choice format. Participants had to choose the most appropriate word for each of the blanks.

Two analyses were applied to the short-term recall posttest in order to measure the influence and effectiveness of cueing on vocabulary acquisition. In order to measure the influence of cueing, the researcher analyzed all words that were exactly or similarly written to the original word in Spanish. With the intention of measuring production, the researcher only analyzed those words that were produced exactly as the original in Spanish.

The means in the short-term recall posttest to measure the influence of the presence or absence of cueing with dynamic or static images in the acquisition of Spanish L2 vocabulary show that the presence of cueing (mean=37.03%) helped the participants to

perform slightly better than those groups presented with no cueing (mean=36.13%). In order to know the significant differences of this condition, the researcher conducted a univariate analysis of variance with a significance set at p=.05. Results showed that there is no significant difference between the presence and absence of cueing (p=.822).

The precise production of words by each group exposed to cueing or absence of cueing with dynamic or static images is illustrated by their means. The analysis shows that the absence of cueing (mean=24.48%) was more effective on exact recall than the54presence of cueing (mean=20.56%). This means that cueing affected negatively the performance of the participants in writing the word. The significance between means was measured with a univariate analysis of variance with the significance set at p=.05. Results show no significant differences between the presence and absence of cueing in this test (p=.242).

Condition	Means in short-term posttests		
	Recall (influence)	Recall (precision)	Recognition
Cueing	37.03%	24.48%	95.73%
No cueing	36.13%	20.56%	93.30%

Table 4. Cueing and absence of cueing means in short-term period

Finally, means in the recognition posttest show that groups presented with cueing benefited more (mean=95.73%) than those presented with no cueing (mean=93.30%) in this test. A univariate analysis of variance with significance at p=.05 showed that there is no significant differences in the groups with or without cueing (p=.109).

4.4. Cueing in Long-Term Period

The long-term effect of the presence or absence of cueing in the acquisition of Spanish L2 vocabulary was also evaluated with recall and recognition posttests. Participants were presented with ten dynamic or static images in the recall posttest. Also, they were exposed to a fill-in-the-blanks format short text to measure recognition, as previously explained. Also, the long-term recall posttest was analyzed in two different ways to measure influence and performance.

The influence of cueing in the recognition of Spanish L2 vocabulary was measured first with a recall test. The comparison of means on cueing (mean=44.25%) or absence of cueing (mean=44.03%) show that there was no difference between the presence and absence of cueing. A univariate analysis of variance was conducted to find the significant difference between the presence and absence of cueing. Statistical significance was set at p=.05. Results show that there is no significant difference in the use or absence of cueing in this test (p=.96)

Condition	Means in long-term posttests		
	Recall (influence)	Recall (precision)	Recognition
Cueing	44.03%	32.46%	93.87%
No cueing	44.25%	30.38%	92.53%

Table 5. Cueing and absence of cueing means in long-term period

Exact production of target vocabulary presented with and without cueing was also measured with the data collected with the recall test. The means show that the groups that used cueing (mean=32.46%) performed slightly better than those groups that did not

use cueing (mean=30.38%). The researcher used a univariate analysis of variance to analyze the statistical significance set at p=.05. Results proved that there was no difference on the presence or absence of cueing in this test (p=.617).

The presence or absence of cueing was also measured in the long-term recognition posttest. The means in groups under those two conditions show that groups using cueing performed slightly better (mean=93.87%) than those with no cueing (mean=92.53%). The researcher used a univariate analysis of variance to measure the statistical significance set at p=0.50. Results showed that no significant difference was given to those groups using cueing in comparison with those that did not use it (p=.535).

	SHORT-TERM		**LONG-TERM**	
	Dynamism	Cueing	Dynamism	Cueing
Recall influence	None	None	None	None
Recall production	Pro-dynamic	None	Pro-static	None
Recognition	None	None	None	None

Table 6. Significance of Post-tests for Dynamic and Cueing Conditions.

CHAPTER FIVE

DISCUSSION

5.1. The Conclusions

Findings of the research show inconclusive results on the use of dynamic and static representations and the presence or absence of cueing in Computer Based Instructional materials in the classroom. These results seem to agree with previous research on dynamism showing no positive effects of dynamic images over static images. Nonetheless, the researcher is aware of the existence of some influential variables that might have affected the results of the study. In the following section, I am going to discuss the main outcomes of the experiment, present its weak and strong points, and consider how external variables might have modified the results.

5.1.1. The Results

Results found in the present study can be categorized as inconclusive. First, in one of the six analyses conducted, animation proved to be statistically significant on the participants' production, i.e., when measuring the precise production in short-term recall of the word. Surprisingly for the researcher, the same analysis showed opposite results in the long-term period, i.e., groups under the static visual condition performed better than the dynamic groups. The researcher expected a decrease on the scores between both the

long-term and the short-term posttest due to time lapse between tests. However, the results were completely opposite, i.e., participants' performance improved over time and a short-term and a long-term period. Finally, the other four analyses show no difference between the use of animation and static images.

In addition, the researcher has found in this study that cueing, when presented in visual stimuli in the form of dynamic and static images, do not have an effect in the recall or recognition of Spanish L2 vocabulary.

The initial goal of the researcher was to compare the effect of dynamism and cueing in a short term and a long-term period. However, as I will discuss in section 5.1.4, results were influenced by an exam conducted in between both short and long-term treatments. This fact affected the results in such a way that a comparison between the short-term and long-term results was not reliable. For that reason, results in chapter four have been presented individually for both terms.

Xiao and Jones (1995) stated that the three main fields of study in L2 where dynamism could be applied were phonetics, verbs of movement, and culture. However, Weiss et al. (2002) classifies dynamic representations as a way to gain attention from the students. As a result, the researcher hypothesized that dynamic images would have an effect on the acquisition of vocabulary. Although they did not belong to any of the categories presented by Xiao and Jones (1995), it would still have an effect on attention and, therefore, retention of vocabulary. Results show that this hypothesis was not borne out by the data.

5.1.2. Predicted Variables Affecting Results

One of the weak points of the experiment was the division of the participants in groups taught by different instructors. As I mentioned in chapter three, the classes were conducted by ten different instructors. Although all instructors were trained in the use of the materials for the study, several problems occurred during the four days of instruction which could have affected the final results. These problems were related to the use of technology and measurement of time which affected the uniformity of instruction in all groups.

Another variable to consider was the distribution of the classrooms for the twenty-two sections participating in the study. Some of the instruction was conducted in tech rooms at the university. However, some of the classes were not technologically equipped and multimedia carts had to be taken into the classroom to project the materials. The amount of time setting the multimedia carts, the poor sound quality provided by the speakers, and the fact that the instructor had to stand next to the cart between the students affected the ability of the instructor to interact face to face with the participants. In this sense, the interaction of the instructor with the students could have modified the outcomes of some of the groups in the study.

5.1.3. The Dual Processing Theory and the Overload of the Visual System

As I introduced in chapter two, the Dual Coding Theory (DCT) (Paivio, 1971, 2007) is an influential theory on the division of the cognitive memory into two systems, the visual system and the word system. Later, Mayer and Moreno (1998) introduced the Dual

Processing theory which defends that the visual system has a limit and it can be overloaded if there is too much exposure to visual materials.

The inconclusive results of this study can be explained in terms of the Dual Processing theory. Participants were exposed not only to dynamic and static images but also to dynamic and static text through cueing. Although when the participants were presented with audio at the time they were exposed to both dynamic images and words, it seems that they could not process all the information that they received. In the average percentages on the participants' scores, the group that used dynamic images and flashing cueing at the same time performed lower than the group with dynamic images and not flashing cueing. This might indicate that the group that saw both dynamic representations, i.e., in words and images, might have suffered an overwhelming dynamic overload. However, if this was true, the group with no dynamic representations and no dynamic cueing should have scored higher than any other group since its participants were not exposed to any type of dynamism. On the contrary, participants in this group scored lower in both recall posttests analysis in the short-term period than in the long-term period. This seems to indicate two things: (i) dynamic images had an effect on the short-term production since both groups under that condition scored higher than the groups with static image, and (ii) mixing both dynamic images and flashing cueing at the same time overloaded the participants' visual system decreasing their production.

5.1.4. Unpredicted Effects of a Variable between the Short and Long-Term Posttests

The initial intention of the researcher was to compare the effects of dynamism and cueing in short and long-term periods of time. Results were expected to decrease in relation to the amount of time elapsed after the first short-term posttest. However, surprisingly for the researcher, means increased in the recall long-term posttest for three of the four groups, i.e., the group with static images and no cueing, the group with static images and cueing, and the group with dynamic images and not cueing. More surprisingly was that the group with dynamic images and cueing lowered their scores while all those three groups increased their scores. On the contrary, the difference on the scores of the short and long-term recognition test were less surprising. Both groups presented with static images, with or without cueing lowered their scores when time passed. Similarly, the group under the dynamic images and cueing conditions had the same outcome. However, the group with dynamic images and no cueing increased its scores in the long-term recognition test. The researcher believes that these unexpected results might have been caused by the preparation to an exam that participants had to take after the short-term posttests and two weeks before the long-term posttest.

Although there was a clear influence of the exam on the increasing scores, the researcher noticed that those results might be representative of how students learn vocabulary outside the class. Nation (2001) states that a person needs certain amount of encounters with a word in order to acquire that word. It seems that the exam between tests gave the opportunity to the participants to encounter words with a sufficient frequency vocabulary to store vocabulary in their memory.

5.2. The Study and Further Research

The present study has tried to present the implications of using dynamic and static images with cueing or absence of cueing in class instruction. Nonetheless, the researcher would like to point out that the division of the groups and the statistical analysis conducted might present certain limitations on the results. Both conditions, dynamism and cueing, were originally crossed and four groups were created, i.e., static images and absence of cueing, static images and cueing, dynamic images and absence of cueing, and dynamic images and absence of cueing. However, for the purpose of this thesis, statistical analysis focused on the influence of dynamic and static images and the influence of the presence or absence of cueing independently. Further statistical analysis is needed to show how the results of the four groups may be affected by crossing of the conditions. Finally, the presence of an exam between the short-term and the long-term posttest made impossible the comparison between short-term and long-term effects of the two conditions.

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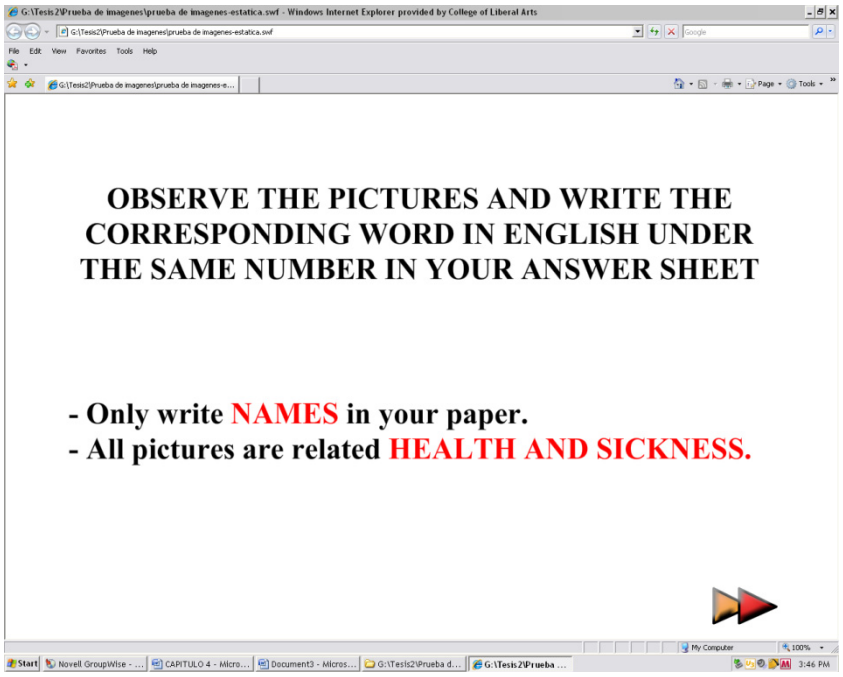
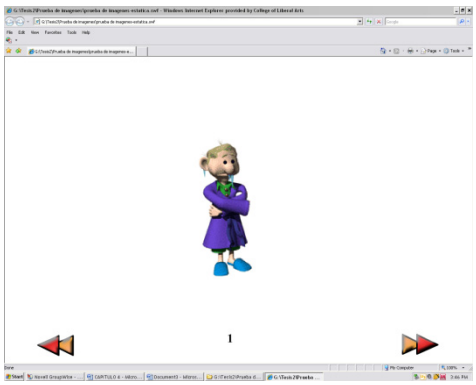
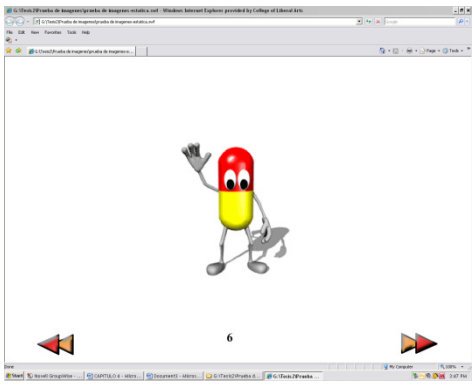
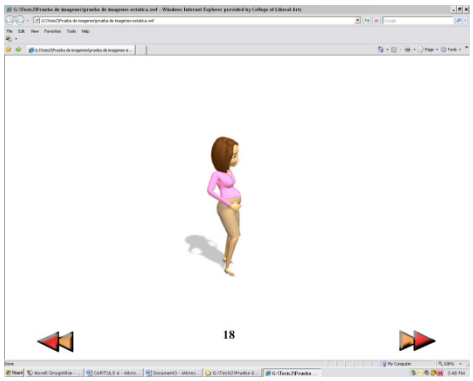
APPENDICES

Appendix A: Pretest for Images









SECTION: 1010- _____

1. _____	14. _____	27. _____
2. _____	15. _____	28. _____
3. _____	16. _____	29. _____
4. _____	17. _____	30. _____
5. _____	18. _____	31. _____
6. _____	19. _____	32. _____
7. _____	20. _____	33. _____
8. _____	21. _____	34. _____
9. _____	22. _____	35. _____
10. _____	23. _____	36. _____
11. _____	24. _____	37. _____
12. _____	25. _____	38. _____
13. _____	26. _____	39. _____

Appendix B: Static Images of the Target Vocabulary

Fonendo
Sthetoscope

Embarazada
Pregnant woman

Enfermera
Nurse

Pastilla
Pill

Silla de ruedas
Wheelchair

Veneno
Poison

Cirujano
Surgeon

Appendix C: Pretest to Measure Previous Knowledge

Questionnaire

NOMBRE: _____ **SECCIÓN**: _____

¿CUÁNTO SABEN?: Escribe en inglés el significado de las siguientes palabras en español. Esta actividad no es una prueba, solamente queremos saber cuánto vocabulario saben:

Dentista:	_____	Estornudar:	_____
Brazo:	_____	Cirujano:	_____
Uña:	_____	Gripe:	_____
Enfermera:	_____	Embarazada:	_____
Enferma:	_____	Sida:	_____
Accidente:	_____	Pierna:	_____
Catarro:	_____	Veneno:	_____
Muletas:	_____	Pastillas:	_____
Ojos:	_____	Psiquiatra:	_____
Farmacéutica:	_____	Fonendo:	_____
Silla de Ruedas:	_____		

Tema 12, Clase 1 – El cuerpo humano y la salud

➔ Contenidos:

VOCABULARIO: El cuerpo humano y la salud (p. 410)
12.1: Expresiones con haber: distintas formas del verbo haber en el presente (hay), pretérito (hubo), imperfecto (había), subjuntivo (haya), futuro (va a haber) y obligación (tiene que haber).

➔ Lesson Plan:

Cuestionario:

Materiales: cuestionario (está al final del lesson plan)
Grupos: individual
Procedimientos: Entregar a los alumnos el cuestionario. Darles uno por persona. Decirles que no es una prueba y que queremos sabes cuánto saben sobre las enfermedades. Recoger el cuestionario y empezar la clase.
Tiempo: 5 minutos

Introducción:

Materiales: Introducción de la lección 1.
Grupo: toda la clase.
Procedimientos: Para empezar la clase, hacer que recuerden el vocabulario estudiado antiguamente en el Paso B sobre las partes del cuerpo. Mostrar las imágenes y que digan lo que es.
Tiempo: 5 minutos.

VOCABULARIO: presentar el vocabulario del libro

Materiales: Vocabulario de la lección 1.
Grupo: toda la clase.
Procedimientos: Hablar con los alumnos para que vayan diciendo al instructor las partes del cuerpo. A medida que los alumnos van diciendo las partes, el instructor puede hacer click en la parte del cuerpo para que la palabra aparezca. Seguir los dibujos del libro. Para usar el verbo haber, hacer preguntas como ¿cuántos dedos hay en una mano?.
Tiempo: 10 minutos.

Actividad 1: Las funciones de las partes del cuerpo.

Materiales: Actividad 1 de la lección 1.
Grupo: en grupos de 2 o 3 personas.
Procedimientos: hacer que los alumnos unan las partes del cuerpo con las acciones en grupos. Cuando pase el tiempo indicado, corregir la actividad con los alumnos presentando las imágenes para cada acción.
Tiempo: 5-7 minutos.

Actividad 2: Las definiciones.
Materiales: Actividad 2 de la lección 1.
Grupo: individual.
Procedimiento: Empezar el archivo de ordenador de la actividad. Tienen que mirar la definición, luego los tres dibujos y elegir el dibujo apropiado. Luego, tienen que deletrear la palabra diciendo las letras que la forma. El instructor deberá hacer click en el hueco correspondiente a cada letra para que ésta aparezca.
Tiempo: 5-7 minutos.

Actividad 3: Rellenar los huecos
Materiales: Actividad 3 de la lección 1.
Grupo: individual
Procedimiento: Presentar el texto en la pantalla de la clase. Decirle a la clase que tienen que rellenar los huecos con las formas de haber (hay, tiene que haber, había, haya, va a haber) Darles el tiempo indicado para trabajar individualmente. Luego corregir con la clase en la pantalla. El profesor **debe** escribir la forma correcta en los espacios en blanco a través del ordenador.
Tiempo: 5-7 minutos.

Actividad 4: Actividad de lectura y escritura
Materiales: Actividad 4 de la lección 1.
Grupo: lectura con toda la clase y escritura individual.
Procedimiento: Hacer que cinco voluntarios lean las cinco partes del texto. Si no hay voluntarios, elegir a los alumnos. Para facilitar la comprensión, hacer click en las palabras en negrita para mostrar la imagen correspondiente. Luego hacer que contesten las 5 preguntas sobre el texto que aparecerán a continuación.
Tiempo: 15 minutos (7 y 7 más o menos para cada cosa)

Tema 12, Clase 2 – Las enfermedades y su tratamiento

➔ Contenidos:

VOCABULARIO: Las enfermedades y su tratamiento (p. 413)
10.2. Expresar cambios de estado: become, get.

➔ **Lesson Plan:**

Introducción:

Materiales: Introducción de la lección 2.
Grupo: toda la clase.
Procedimientos: Para empezar la clase, hacer que recuerden el vocabulario estudiado el día anterior. Mostrar las imágenes y que vayan diciendo palabras de lo que ven en la pantalla. Recuerden que no es importante que digan lo que es exactamente, sino que digan tantas palabras como puedan.
Tiempo: 5 minutos.

VOCABULARIO: Mi familia y las enfermedades

Materiales: Vocabulario de la lección 2.
Grupo: toda la clase.
Procedimientos: Decirles a los alumnos que presten atención a la pantalla de la clase y que cierren los libros. Poner el audio primero y mostrar las imágenes en la pantalla principal del ordenador. Posteriormente, repasar las palabras de vocabulario una a una haciendoles que lean el texto a la vez que escucha en audio de nuevo. Finalmente, hacerles unas preguntas para observar su comprensión.
Tiempo: 10 minutos.

TEXTO

- Mi familia siempre está enferma. Mi madre estuvo enferma en el hospital. Ella tuvo gripe el año pasado. En el hospital la enfermera la cuidó y le dio las medicinas. Ella ahora está mucho mejor y hace de enfermera cuando nosotros tenemos gripe.
- Mi padre se fracturó una pierna la semana pasada. Ahora él tiene que ir en silla de ruedas porque no puede usar muletas. Él no puede caminar y tiene que descansar todo el tiempo. Se pone muy nervioso y está siempre de mal humor.
- Mi hermana ahora está embarazada. Ella va a tener un bebé. El bebé se va a llamar Pedro. Ella está muy feliz pero está muy cansada porque tiene una barriga muy grande.
- Mi hermano, cuando él era pequeño, se tomó un poco de veneno. Mis padres lo llevaron al hospital rápidamente. Él estuvo en el hospital por dos días.
- Pero por suerte tenemos un familiar que cuida de nosotros. Mi tío es cirujano. Él cuida de los enfermos y los opera. Casi nunca se pone enfermo pero a veces tiene catarros y estornuda. Normalmente, él me deja usar su fonendo cuando juego a los médicos.
- Yo ahora tengo dolor de barriga. Me duele mucho. El médico me ha dicho que tengo que tomar unas pastillas, pero a mí no me gustan porque saben muy mal... ¡qué asco!

Actividad 1: Preferencias – cuando me siento mal.

Materiales: Actividad 1 de la lección 2.
Grupo: toda la clase

Procedimiento: Mostrar la actividad en la pantalla. Luego, preguntarles a los alumnos qué hacen en esas situaciones. Tienen que elegir entre las opciones de la pantalla. Mostrarles las imágenes de las palabras que están en negrita. Preguntarles la misma pregunta a unos 2 o 3 alumnos más o menos y contrastarlos.
Tiempo: 5-7 minutos

Actividad 2: Doctor, ¿qué debo hacer?
Materiales: Actividad 2 de la lección 2.
Grupo: grupos de 2 o 3 personas
Procedimiento: Repasar rápidamente la gramática del tema. Después, mostrar la actividad en la pantalla de la clase. Leer las preguntas y repasar el vocabulario de las situaciones con los dibujos con la clase. Luego dejar conversar a los alumnos para unir las situaciones con las soluciones posibles. Recuerden que la letra **f. ¿¿??** Permite escribir lo que queramos en caso de que haya alguna respuesta alternativa de algún alumno. Finalmente, corregir con la clase pidiendo voluntarios. Cambiar los papeles y volver a repetir.
Tiempo: 10 minutos

Actividad 3: Conversación
Materiales: Actividad 3 de la lección 2.
Grupo: en parejas.
Procedimiento: Mostrar en la pantalla las situaciones por las que tienen que preguntar a sus compañeros. Repasar las situaciones con ellos para saber que han comprendido. Mostrar las imágenes de las palabras en negrita. Luego hacerles que hablen con sus compañeros. Después, corregir con toda la clase.
Tiempo: 10 minutos.

TAREA PARA CASA: Escribir un párrafo de unas 50 palabras explicando cuando fue la última vez que el alumnos se puso enfermo y qué hizo para remediarlo. Especificar que pueden invertarse la historia para poder usar el mayor número de palabras del vocabulario que puedan.

Tema 12, Clase 3 – Las visitas al médico, a la farmacia y al hospital

➔ **Contenidos:**

Vocabulario: las visitas al médico, a la farmacia y al hospital
12.3: Objetos Indirectos con mandatos y subjuntivo: Presenta 4 nuevos verbos que llevan objetos indirectos y luego piden un subjuntivo.

➔ **Plan de clase:**

Prueba de CPS: Hacer la prueba de CPS.

Materiales: Archivo CPS
Grupo: individual
Procedimiento: Encender el CPS. Mostrar las preguntas y hacer que los alumnos contesten con los mandos.
Tiempo: 10-15 minutos.

VOCABULARIO: Las visitas al médico, a la farmacia y al hospital.

Materiles: vocabulario de la lección 3
Grupo: toda la clase.
Procedimientos: Presentar el vocabulario. Primero los alumnos tienen que escuchar un audio y ver las palabras clave. Hacer que los alumnos lean las frases en español y preguntar por las palabras que no conocen. Mostrar el vocabulario de las palabras en negrita. Luego hacer que los alumnos conversen entre ellos con las preguntas siguientes.
Tiempo: 10 minutos.

Actividad 1: Juego de oscuro a claro.

Materiales: Actividad 1 de la lección 3.
Grupo: toda la clase
Procedimientos: Mostrar las instrucciones a la clase y el ejemplo. Los alumnos tienen que mirar una imagen que pasa de borrosa a más claro progresivamente. Tienen que adivinar las palabras antes de que la imágen se vuelva clara del todo.
Tiempo: 5-7 minutos

Actividad 2: ¿Qué les recomienda el Doctor Sánchez a estas personas?

Materiales: Actividad 3 de la lección 3.
Grupo: toda la clase, por voluntarios.
Procedimientos: Mostrar la gramática de los nuevo 4 verbos que introducen el subjuntivo. Mostrarles el modelo a los alumnos. Leer cada oración antes de hacer la actividad y hacer que conviertan las oraciones como en el modelo para usar el subjuntivo.
Tiempo: 5-10 minutos.

Actividad 3: Firmas

Materiales: Actividad 3 de la lección 3.
Grupo: toda la clase.
Procedimientos: Antes de empezar, leer las oraciones y mostrar las fotografías de las palabras que están en negrita. Los alumnos tienen que levantarse y buscar a las personas que hacen las acciones indicadas en la pantalla. Después de 5 minutos, hacerles que se sienten y digan quién hace esa cosa. Expander la

conversación con preguntas a los estudiantes alguna otra información relacionada con el vocabulario.
Tiempo: 10 minutos.

Tema 12, Clase 4 – Los accidentes y las emergencias

➔ **Contenidos:**

VOCABULARIO: los accidentes y las emergencias (p. 422)
12.4. Sucesos sin planear con "se": introducir verbos como *se descompuso*, *se cayó*, *se rompió* y otros con pronombre como *se me olvido*, *se le perdió*, *se me quedaron*.

➔ **Plan de clase:**

QUIZ: Prueba del tema 12.
Materiales: documento de Word "prueba de clase".
Grupo: individual y sin copiarse.
Procedimientos: Entregar los papeles para las respuestas. Encender la pantalla y mostrar las imágenes. Dejarles que completen los huecos con la palabra más adecuada a la imagen mostrada. No hay contexto.
Tiempo: 10 minutos.

VOCABULARIO:
Materiales: Vocabulario del libro (pp. 422 y 423)
Grupo: Toda la clase
Procedimiento: Hacer que algún voluntario lea las palabras en español. Si no hay voluntarios, elegir a una persona de la clase. Hacer TPR para las palabras que los alumnos no comprendan.
Tiempo: 10 minutos.

Actividad 1: Descripción de dibujos
Materiales: archivo de flash o Actividad 12, p. 423
Grupo: toda la clase.
Procedimiento: Mostrar las imágenes y leer las oraciones de cada una de las situaciones. Hacer que los alumnos digan el número de la imagen. Poner especial énfasis en el "se" de sucesos sin planear.
Tiempo: 5 – 7 minutos.

Actividad 2: Completar el texto estilo multiple choice
Materiales: PowerPoint para CPS
Grupo: individual

Procedimiento: Completar un texto con huecos. Cada hueco tiene una imagen y varias opciones tipo multiple choice.
Tiempo: 10 minutos.

Actividad 3: Práctica de escuchar 2

Materiales: documento flash "El Accidente de Guillermo" (tomar las fotografías de la actividad 13 del libro, p. 424)
Grupo: individual
Procedimiento: Decirle a los alumnos que cierren los libros ya que la actividad está en la p. 424. Abrir el documento de flash en la pantalla principal. Decirles que los dibujos están desordenados y que van a escuchar un audio con la historia. Luego decirles que tienen que ordenar las imágenes en su papel de acuerdo con el audio. El texto se puede sacar de las letras azules de la actividad. Luego, preguntar a los estudiantes y ordenar las imágenes de acuerdo con la información que nos digan. Poner el audio 2 veces.
Tiempo: 10 minutos

Appendix E: Short-term Recall Test

Prueba Capítulo 12 **Nombre**: _____
Sección: 1020- _____

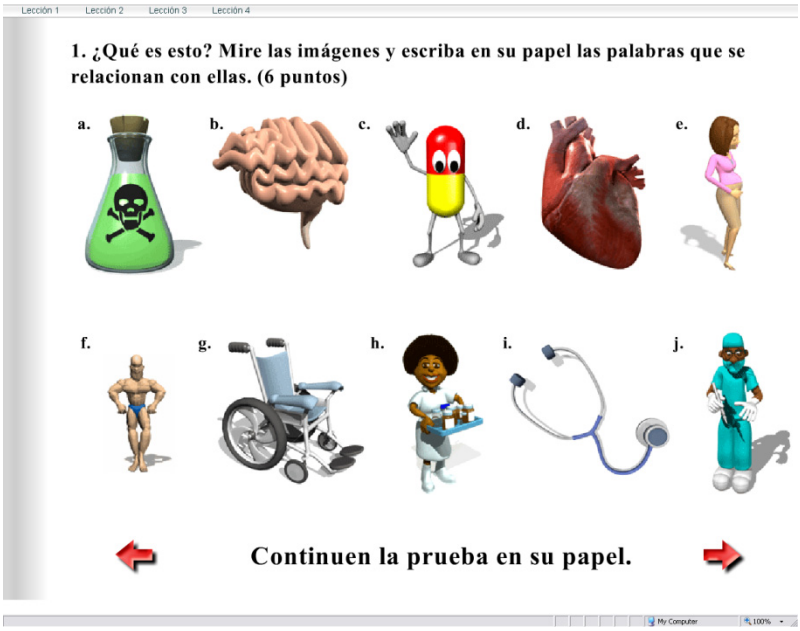
1. **¿Qué es esto?** Mire las imágenes y escriba en su papel las palabras que se relacionan con ellas. (10 puntos)

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____
i. _____
j. _____

2. **Mario y los médicos**. Mario habla sobre las peticiones (requests) de los médicos. Escriba los siguientes verbos en el **subjuntivo** (5 puntos)

a. Mi veterinario nos pide a mi mujer y a mí que nosotros _____ (**DAR**) muchas medicinas a nuestro perro.
b. La psiquiatra le aconseja a mi mujer que ella _____ (**ALEGRARSE**) por las cosas buenas de la vida.
c. Los médicos les recomiendan a los pacientes que ellos _____ (**HACER**) ejercicio todos los días para vivir muchos años.
d. Voy a ir al hospital cuando _____ (**HABER**) menos personas en la sala de espera.

Appendix F: Long-term Recall Test



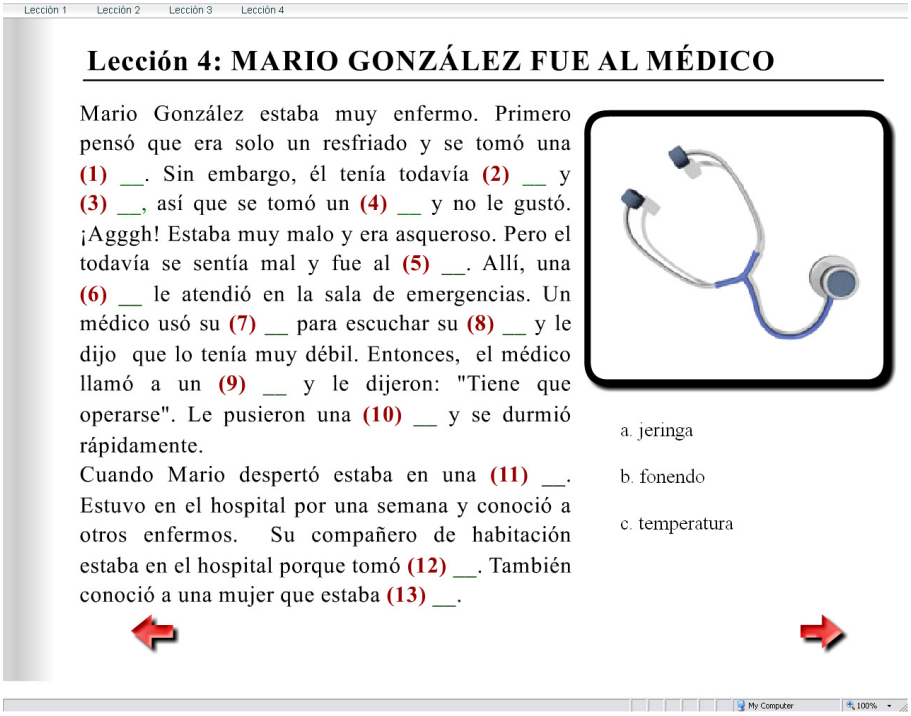
Nombre: _____
Sección: 1020- _____

1. **¿Qué es esto?** Mire las imágenes y escriba en su papel las palabras que se relacionan con ellas. (10 puntos)

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____
i. _____
j. _____

Appendix G: Short-term Recognition test

Instrucciones: En esta actividad va a ver un texto con espacios en blanco. En cada espacio hay una imagen y tres palabras para seleccionar. Escriba en el papel que el profesor les va a dar la respuesta correcta. El trabajo es individual, no pueden trabajar con su compañero. Luego, devuelvan el papel a su profesor y corrijan la actividad.


Lección 1 Lección 2 Lección 3 Lección 4

Lección 4: MARIO GONZÁLEZ FUE AL MÉDICO

Mario González estaba muy enfermo. Primero pensó que era solo un resfriado y se tomó una **(1)** __. Sin embargo, él tenía todavía **(2)** __ y **(3)** __, así que se tomó un **(4)** __ y no le gustó. ¡Agggh! Estaba muy malo y era asqueroso. Pero el todavía se sentía mal y fue al **(5)** __. Allí, una **(6)** __ le atendió en la sala de emergencias. Un médico usó su **(7)** __ para escuchar su **(8)** __ y le dijo que lo tenía muy débil. Entonces, el médico llamó a un **(9)** __ y le dijeron: "Tiene que operarse". Le pusieron una **(10)** __ y se durmió rápidamente.

Cuando Mario despertó estaba en una **(11)** __. Estuvo en el hospital por una semana y conoció a otros enfermos. Su compañero de habitación estaba en el hospital porque tomó **(12)** __. También conoció a una mujer que estaba **(13)** __.

a. jeringa

b. fonendo

c. temperatura

My Computer 100%

Actividad 2 – Hoja de respuestas **Nombre:** _____
Sección: 1020-_____

Marque la respuesta correcta:

1.	☐**A**	☐**B**	☐**C**	**8.**	☐**A**	☐**B**	☐**C**
2.	☐**A**	☐**B**	☐**C**	**9.**	☐**A**	☐**B**	☐**C**
3.	☐**A**	☐**B**	☐**C**	**10.**	☐**A**	☐**B**	☐**C**
4.	☐**A**	☐**B**	☐**C**	**11.**	☐**A**	☐**B**	☐**C**
5.	☐**A**	☐**B**	☐**C**	**12.**	☐**A**	☐**B**	☐**C**
6.	☐**A**	☐**B**	☐**C**	**13.**	☐**A**	☐**B**	☐**C**
7.	☐**A**	☐**B**	☐**C**				

Appendix H: Long-term Recognition Text

Instrucciones: ¿De qué te acuerdas? Ahora complete el siguiente texto usando la palabra más adecuada para cada espacio en blanco.

MARIO GONZÁLEZ FUE AL MÉDICO

María irá al médico hoy porque tiene un poco de **(1)**___. Ella pensó: "Tan pronto como llegue al hospital, me sentaré en una **(2)**___". Después de esperar en la sala de espera, la **(3)**___ llamó a María a la consulta. Allí, el médico usó su **(4)**___ para escuchar el **(5)**___ de María. "¡Ajá!" dijo el médico, "le diré qué tiene después de que llegue mi compañero". Después de llegar un **(6)**___, ellos le explicaron que no tenía ninguna enfermedad, sino que estaba **(7)**___. El médico le recetó una **(8)**___ a María y le puso una **(9)**___.

Después de cuatro meses, María tuvo a su hijo Roberto. Su compañero de habitación, que estaba en el **(10)**___ por tomar un **(11)**___, le preguntó: "antes de que se vaya de aquí, ¿me dejará sostener a su hijo en mis brazos?". María, que estaba muy contenta, le dijo que sí.

a. embarazada

b. enferma

c. dolor

Hoja de respuestas **Nombre:** _____
Sección: 1020-_____

Marque la respuesta correcta:

1.	☐**A**	☐**B**	☐**C**	**8.**	☐**A**	☐**B**	☐**C**
2.	☐**A**	☐**B**	☐**C**	**9.**	☐**A**	☐**B**	☐**C**
3.	☐**A**	☐**B**	☐**C**	**10.**	☐**A**	☐**B**	☐**C**
4.	☐**A**	☐**B**	☐**C**	**11.**	☐**A**	☐**B**	☐**C**
5.	☐**A**	☐**B**	☐**C**	**12.**	☐**A**	☐**B**	☐**C**
6.	☐**A**	☐**B**	☐**C**	**13.**	☐**A**	☐**B**	☐**C**
7.	☐**A**	☐**B**	☐**C**				