

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL
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THE ROLE OF WORKING MEMORY IN VOCABULARY ACCESS

Porto Alegre

2011

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Trabalho de conclusão de curso,
apresentado como requisito parcial para
obtenção de título de licenciado em Letras
pela Universidade Federal do Rio Grande
do Sul.

Orientadora: Profa Dra. Ingrid Finger

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Aprovada em ____ de _____ de _____.

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ACKNOWLEDGMENTS

During the period I have been at UFRGS there are some very important people I would like to thank for having supported and encouraged me to continue through the end, and have taught me so much.

First of all, I would really like to thank my advisor Ingrid, who has taught so much and was a great inspiration throughout this course.

I am also grateful to professor Anamaria Welp, who allowed me to use her group to collect the data for this paper and motivated her students to participate in it, and for being part of my evaluation defense. I also want to thank her students for being very patient and taking the tests.

Thanks also to professor Ubiratã Alves, someone I really admire, for being part of my evaluation defense and also a great teacher.

I would like to thank professor Ana Fontes, not only for her help in this paper, but also for allowing her students to participate on my study. And, of course, her students, for their cooperation on the data collection.

A special thanks to my parents, Luiz Bayard and Anamaria, who also supported me during this journey and always believed I could do it.

I also would like to thank all my classmates, who, one way or the other, have helped me go through those 6 years of joy and hard work.

Of course there were many important professors who motivated me and praised my effort. Among them are Sérgio Menuzzi, Rita Lenira Bettencourt and Antônio Sanseverino.

*“Time changes all things; there is no reason why
language should escape this universal law”*

— Ferdinand de Saussure

RESUMO

Este trabalho tem como objetivo investigar a correlação entre alcance de memória de trabalho e acesso de vocabulário em um grupo de brasileiros estudantes de inglês como segunda língua. A memória de trabalho possibilita o armazenamento e a manipulação temporária da informação de curto prazo como mostrado em estudos anteriores a memória de trabalho é utilizada na execução de tarefas, assim como no processo de aprendizado, sendo um componente cognitivo importante. O sucesso da fluência tanto na língua materna como em segunda língua, envolve a habilidade de memorização de sequências de linguagem. A memória de trabalho foi extensamente estudada por Alan Baddeley e Graham J. Hitch (1974), criando juntos um modelo segundo o qual ela se subdivide em 'loop' fonológico e bloco de rascunho visuo-espacial. O papel de um professor é encontrar formas de facilitar o processo de aquisição e acesso à linguagem entendendo como ele funciona, por esta razão, o objetivo específico deste estudo é comparar os resultados dos testes de memória de trabalho e o de acesso lexical de palavras abstratas e concretas. Para esta investigação também é comparado o tempo de resposta para palavras abstratas e concretas. Para isso, foram realizados testes de memória de trabalho (BAMT) seguidos de testes de vocabulário com 2 grupos, um total de 27 alunos da Universidade Federal do Rio Grande do Sul. Ambos os grupos pertencem ao nível 2 do curso de Letras, e são adultos entre 17 e 37 anos de idade. Entretanto, nenhuma das duas hipóteses iniciais foram confirmadas. A primeira buscava confirmar que alunos com maiores resultados em memória de trabalho também obteriam os maiores escores em Acesso de vocabulário, entretanto não encontrou-se correlação substancial entre os resultados dos testes de memória de trabalho e os de vocabulário. A segunda hipótese, que dizia respeito a maior acurácia para palavras concretas, e também reação de resposta mais rápida para estas palavras, também não foi confirmada, o que ocorreu foi o oposto do que era esperado. O escore das palavras abstratas foi mais alto do que o escore das palavras concretas. O tempo de resposta de ambas foi relativamente igual.

Palavras-chave: Memória de trabalho, vocabulário, segunda língua, acesso lexical.

ABSTRACT

The aim of this paper is to investigate the correlation between working memory capacity and vocabulary access in Brazilian students of English as a second language. Working memory allows for the temporary storage and manipulation of short-term information as shown in previous studies, working memory has an important role in task related activities, as well as in the learning process. It is an essential cognitive component. The success of language fluency, both in native and foreign languages, involves the ability of memorizing sequences of language. Working memory seems to be deeply involved in the process of language acquisition and learning of sequences. Working memory was extensively studied by Alan Baddeley and Graham J. Hitch (1974). Together they have developed a model which subdivides it into the phonological loop and the visuo-spatial sketch pad. The role of a teacher is to find ways to facilitate the process of language acquisition and access understanding how it functions, therefore, the specific aim of this paper is to compare the results of the working memory and lexical access of abstract and concrete words. For this investigation the reaction time for abstract and concrete words are compared. For that, a working memory test followed by a vocabulary test was applied in 2 groups of participants, a total of 27 students. They were adults ranging from the age of 17 to 37. Both of the groups were from English level 2 of Letras course. However, neither one of the initial hypotheses were confirmed. There was no substantial correlation between the results of the working memory test and the vocabulary test. The second hypothesis was not confirmed either, in fact, what was found was the opposite of what we expected. The score for abstract words was higher than the score for concrete words. The reaction time for both was relatively the same.

Keywords: Working memory, vocabulary, second language, lexical access.

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1. INTRODUCTION

A lot has been researched about what can help students improve their learning skills in second language acquisition. There are several studies which try to find out what makes a student a better learner. What kind of environment is more appropriate, what motivates and engages students, what can predict greater vocabulary acquisition, and, of course, in the field of teaching, what can teachers do to facilitate the learning process and make it more effective. Knowing more about what goes on in the students brain while learning would allow for us, teachers of English as a second language, to better prepare our classes, likewise, taking into account those processes to use them in our students advantage in the classroom.

Vocabulary can be considered one of the main points in language acquisition, it serves as a useful and fundamental tool for communication. A great number of theories about language acquisition have been created in order to explain these abilities (WALLACE, 1988; CARTER, 1987; CRYSTAL, 2003; GARDNER, 1990; KRASHEN, 1989). Being able to learn and access an extensive vocabulary is one of the most complex challenges for students of a second language who aim to be fluent. This capacity involves the ability of picking up different cognitive skills, including syntax, phonetics, and a wide range of lexical items. A major concern in understanding language acquisition is how these capacities are learned and recalled.

There is a considerable amount of evidence that input alone is not enough to obtain high levels of proficiency in a second language. Attention, concentration and encoding are also important features of vocabulary learning (MACINTYRE and GARDNER, 1994). Cognitive operations within the brain play an important part, those operations actively control the processes of generating meaning while making sense of experiences and perceived realities. Processing language include organization, storage and the assimilation of the input, this requires internal manipulation of the vocabulary items learned at the input stage. Memory is, possibly, another predictor, considering that without it nothing would be retained and no language would be acquired.

It has been shown that working memory is significantly involved in vocabulary acquisition and access (BADDELEY, 1999). Researchers who investigate second language acquisition have explored the significance of working memory in language learning (JUFFS, 2006). According to Juffs it appears to be common ground that, in part, the explanation for

certain differences among students who do well when learning a second language is credited to differences in their working memory capacity. This is based on the idea that working memory is a temporary capacity used to process, analyze and manipulate recently perceived information. Citing Harrington & Sawyer (1992); Just et al. (1996) and Cheung (1996) also mentions that the phonological working memory, or the phonological loop could be said to be the ability to accurately recall lists of words in the same order as they appear, and that there is a variation in the amount of words people can remember.

Within this context, this study investigates the effects of working memory capacity in a vocabulary access task in a group of beginner Brazilian learners of L2 English. Working memory capacity was assessed through the BAMT Battery (WOOD et al., 2001) and vocabulary access was assessed with an online task in which reaction time and accuracy for concrete and abstract lexical items were measured. The study was conducted with 27 participants who are enrolled at the second level of English classes at the Letras course at a public University in Porto Alegre, RS. The students were between 17 and 37 years old, and the average age was 22.44. There were 13 men and 14 women in the sample.

This paper is organized the following way. In the first chapter, the theoretical background will be presented. First, a brief introduction of working memory and how it functions will be given and then vocabulary acquisition and access will be discussed. In the second chapter, the method and the study that was conducted will be described. There, the objectives and the hypotheses of the investigation, as well as details regarding the participants of this study will be presented. The procedures and the materials selected for the data collection used in both tests will be examined as well. In the third chapter, the analysis and discussion of the results will be presented. Finally, some final considerations and limitations of the study will be addressed.

2. THEORETICAL BACKGROUND

2.1 Working Memory Definition

According to Baddeley and Hitch (1974) working memory can be defined as a system that temporarily stores and manipulates information that is required to process complex cognitive tasks such as learning languages, comprehending and reasoning. It is responsible for the selection, initiation and termination of information processes like encoding and retrieving data. As mentioned by Ericsson and Kintsch (1995), working memory is the ability to keep recent information for a short period of time and use this information to perform tasks. Cowan (1999) suggests that it could be referred to as short-term memory or even recent memory, however, short-term memory refers to information without the use of manipulation, therefore, being considered a component of working memory. Daneman & Carpenter (1980) contend that working memory is a kind of construct developed by cognitive psychologists to explain the role of short-term memory in complex cognition.

Baddeley and Hitch (1974) created a model to explain short-term memory and named it working memory. Their first concept was that the working memory was made of two separate sub-systems, they can be described as follows: the visuo-spatial sketch pad, which creates and maintains visual-spatial representations such as scanning. It is a cognitive ability and a mental process to maintain and recall visual and spatial information. And the phonological loop, on the other hand, deals with phonological and auditory memory, and it is subject to rapid decay of the information. The central executive, which controls the other two, elaborates and coordinates activities and is responsible for the transmission of information within the cognitive system. It designates people's focus of attention as well as establishes logical thinking. The following figure illustrates Baddeley and Hitch's model (1974) and the role of its components.

Working Memory Model (Baddeley and Hitch, 1974)

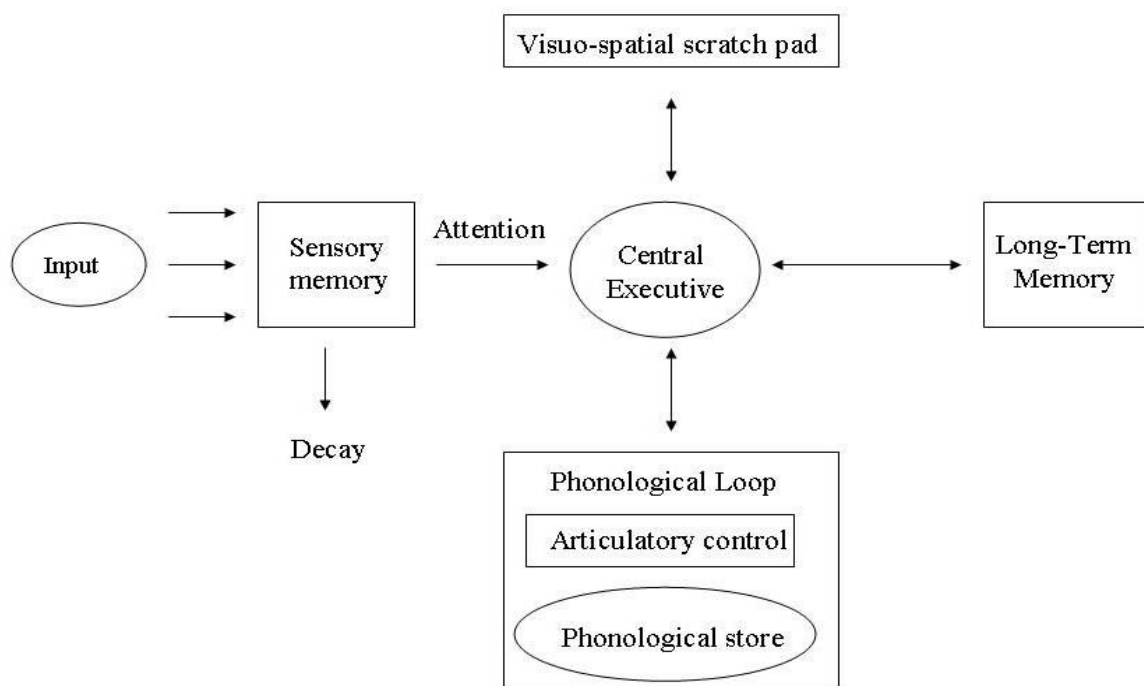


Figure 1 – Working memory model by Baddeley and Hitch (1974)¹.

Years later Baddeley (2000) added a fourth component to the Model, he called it the episodic buffer. According to the author, the episodic buffer is a temporary store of limited capacity and is able to integrate different dimensions. This system can be used as an auxiliary store as well as a place to combine different kinds of information such as verbal and spatial, in the working memory. Another characteristic of the episodic buffer is that it is a place where short-term memories of complex information such as temporally data are stored. It can also serve as a “mental modeling space, allowing one to set up representations that might guide future actions” (BADDELEY & WILSON, 2002, p. 1738).

Working memory is a limited capacity system, since there is a limit to the number of different memory representations that can be stored in an accessible state. Miller (1956) in “The magical number 7 plus or minus 2” estimated the capacity of immediate memory to be of around 7 items. They could be either digits or words. It represents the amount of chunks of information someone is able to hold in the working memory at a time.

¹ Available at <<http://www.simplypsychology.org/working%20memory.html>>. Accessed in 10/12/11.

In addition working memory is considered a system of operational resources that uses short-term memories and attention (TURNER & ENGLE, 1989). Engle (2002) argues that attention can influence the integrity of representations in working memory. Some possible mechanisms of attention include changes in attentional selection or other mechanisms used for the maintenance of various information types, like auditory and visual, which may also depend on the ability to top-down control over the items to be maintained.

Cowan (1988; 1995; 1999; 2001) has proposed an alternative model of the working memory, positing an attentional system with a capacity of about four chunks as its main characteristic. The author claims that his model is able to specify the interaction between the central executive and the episodic buffer. He tries to explain how people can recall small amounts of information in short intervals, arguing that this is due to a limited focus of attention. This focus combines both voluntary and involuntary processing. He states that working memory functions better when items are grouped in three or four, which he called “The magical number 4” in reference to Miller (1956). He also suggests that some important points still need to be further looked into, such as modularity, capacity and decay.

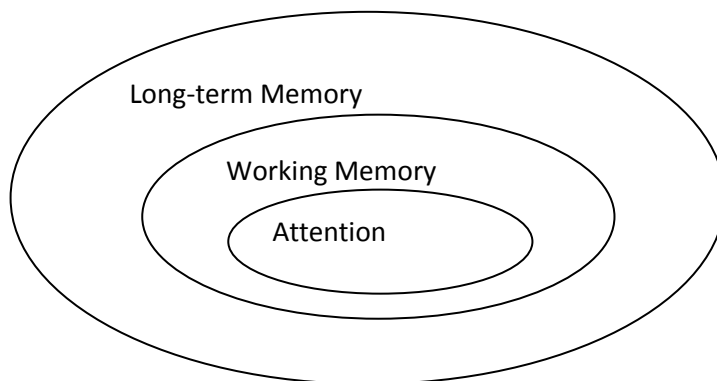


Figure 2 – Representation of embedded process (Cowan, 1999 PP.62)

2.2 How Working Memory Functions

Working memory capacity research demonstrates that the ability to control attention, especially when facing competing demands, is a determinant of performance in working memory tasks (BARRETT, TUGADE, & ENGLE, 2004; ENGLE, 2002). Previous researchers have pointed out that the amount of information a person is able to attain varies (DANEMAN & CARPENTER, 1980), and that this can predict the degree of intelligence of a

person. Working memory capacity is normally assessed using complex span tasks with two separate components, (1) a processing component, and (2) a concurrent storage component in which the participant has to remember unrelated information for later recall (CONWAY et al., 2005).

In Engle's view (2002), working memory is the ability to use this attention to keep information in such a way that it could be assessed when needed, as fast and effectively as it is required. Because working memory is also responsible for avoiding distracters, controlling attention plays an essential role in it. Being able to cope with interference is one of the most relevant features of working memory (KANE & ENGLE, 2000). Engle also argues that working memory capacity is not only related to memory but, above all, it is based on control of cognition (ENGLE, 2002; KANE et al., 2007). The author endorses the view of an "executive attention", where the ability to master top-down control predicts greater performance in working memory tasks. Therefore, some studies have suggested that the more a person is capable of controlling attention amongst interference, the better he will score on working memory tests.

Working memory can be compared to the ability of a computer, as it is a command executed to retrieve data that is in storage awaiting to be used when it is requested. The complete process of this memory takes only a few seconds. The information we store in the hard disk is similar to long-term memory, while the Random Access Memory (RAM), the temporary memory storage of a computer, would correspond to our working memory. According to Baddeley (1992) it is the process of actively holding information in the mind's eye or the mind's ear and using it to guide and control behavior. It is an appropriate metaphor because working memory is a temporary working area, very much like the RAM, it is deleted after it is used. It is also totally flexible towards its content, and it is capable of performing several simultaneous tasks or programs.

One example of how people use working memory in everyday life is when one is looking for a professor's e-mail address on the Internet. It is necessary to keep in mind the person's name, university name and department, and, at the same time, avoid distracters, such as advertisement and other unnecessary information. While performing these tasks simultaneously, we are using our working memory capacity. It is the ability to concentrate on what we need and ignore all other pieces of dispensable information.

Another situation in which working memory is necessary is simultaneous interpreting, when a person must hear or see the words, process and transfer them into the second

language in a very short period of time making use of all knowledge about the word, while precisely selecting the most appropriate words according to the context. Translation means the act of transforming a code into another code, from one language or dialect into another one. This decoding process demands the use working memory. In the words of Hartman and Stock (1972 :713) “Translation is the replacement of a representation of a text in one language by a representation of an equivalent text in a second language.” Translation is regarded as a challenging language task requiring extensive analysis and understanding of words and sentences in the original language, then performing selective retrieval of the corresponding words and sentences in the target language. A control system as the one described in the working memory is responsible for supervising the entire process.

2.3 Language Learning and Working Memory

Studies on working memory capacity have developed considerably in the last 30 years, and this has helped scholars to understand its role in predicting and improving learning (CONWAY et al., 2005). Working memory is of great importance in language learning (GATHERCOLE & BADDELEY, 1993). For instance, Breznitz & Share (1992) explain how failures in working memory are often responsible for learning disabilities. According to Cowan (2005) there are three distinct moments in the proper use of working memory: the first is receiving information, which can be considered the input, and maintaining the focus of attention. The second is being able to handle this information correctly, rehearsal is necessary in this phase. The third is shifting information correctly from working memory to long-term memory, this can be done by encoding the received information or relating it to previously known information.

As reported by Baddeley (2003) deficiencies in working memory can cause great difficulties for learners of language. Students who take longer to learn, although they show average performance on non-verbal intelligence have demonstrated low score on working memory tests. Studies on adults with reading disability also identified them as having working memory deficits (BADDELEY & WARRINGTON, 1970; MILNER, 1966). Researches support that the role of the phonological loop in language learning is of utmost importance (e.g. BADDELEY, GATHERCOLE, & PAPPAGNO, 1998), since the phonological loop is directly connected to the acquisition of new words.

Conway and Getz (2010) tested the performance of people who had gone through several sessions of working memory training and compared them to another group who had not done it. The group who had working memory training showed more positive results than the later one in fluid intelligence². That experiment supports the idea that working memory is not only responsible for the manipulation of information, but it can also be trained to improve students' learning skills and overall performance in the understanding and production of language. The training is done by submitting participants to several batteries of working memory tasks, such as the one presented in this paper. Dempster (1991, apud CONWAY 2005) argues that one of the most important aspects of intelligent behavior and its connection with working memory capacity is its ability to inhibit distracting information.

The psychiatrist Bart Rypma (2003) studied the relation between age and working memory in cognitive skills. His work corroborates previous studies that show that working memory capacity decreases as age goes up. That is, people tend to take longer to process data as they get older (SALTHOUSE, 1996). Rypma argues that higher activation that comes with age is connected to the decrease in the ability of transmission mechanisms that contribute to cognitive skills. He also defends that older people make up for that by taking advantage of other strategies, such as digit-span performance, when performing cognitive tasks, in what he calls a compensatory theory.

These concepts were explained and discussed in this chapter in order to support the notion that working memory affects vocabulary access, which is the basis of this paper. In the next chapter the concepts of vocabulary will be investigated and presented.

2.4 Vocabulary

2.4.1 Definition

The Merriam-Webster Dictionary of English (2011) offers three definition of vocabulary:

² **Fluid Intelligence** - The ability to form concepts, reason and identify similarities; it is intuitive and represents the activity involved when forming new mental structures rather than making use of old ones. It includes the ability to see complex relationships and solve problems, and it can decline with age if not 'exercised'. Segen's Medical Dictionary. 2011, Farlex, Inc. All rights reserved.

1. A list or collection of words and phrases usually alphabetically arranged and explained or defined.
2. A list or collection of terms or codes available for use.
3. A sum or stock of word employed by a language group, individual or in a field of knowledge.

As it is described in the Oxford Advanced Learner`s Dictionary (2011), vocabulary can be defined as the group of words people are most familiar with and are able to use properly and understand. Speakers can use vocabulary in different ways, speaking, writing, listening and reading are the most common ones. This dictionary also explains that vocabulary is the set of words a person needs to know in order to communicate effectively in one specific language. Speakers can use vocabulary in different ways, in listening, reading, speaking and writing. Vocabulary enables people to deal with each other in everyday situations.

According to Nation (2001) vocabulary can be divided in two main groups: receptive or passive vocabulary, the set of words people are able to recognize and understand when they hear or read. Productive or active vocabulary, the set of words people can speak or write properly. The second one tends to be usually in smaller number than the first, for it demands more practice and knowledge of the lexical item. David Crystal (1995) says that “vocabulary is the Everest of language” (p.116), while S. Burton (1982) asserts that “without a large vocabulary, it is impossible to use English language precisely and vividly” (p.98). Both authors outline the significance of vocabulary knowledge to a proper use of language.

2.4.2 Vocabulary Acquisition

During the 1950`s researchers noticed that teaching vocabulary is not about simply translating words from the mother tongue to the target language. It would be more productive to teach vocabulary in a contextualized way. Allowing students to see the word in its real use, syntactically, semantically, and paradigmatically (CARTER, 1987, p.181) would provide a more successful understanding of it. Nowadays meaning plays a central role in language teaching. Students have difficulties in learning grammar or pronunciation, for example, if they do not know what a word means. Allen (1983) reported to have found that lexical difficulties very often interfere with overall communication, preventing proper understanding and use of the target language.

Some scholars such as Lewis (1993) point out that the teaching of vocabulary is the most important part of a class, because “language consists of grammaticalized lexis, not

lexicalized grammar” (p.34). According to Wallace (1988) to really understand a word is to be able to recognize it when we hear it, recall it, relate it to other contexts, use it appropriately and be able to pronounce and spell it correctly. On the other hand, Carter & Mc Carthy (1988) point out that understanding a word entails knowing its limitations of use in each specific situation, knowing what it can be associated to, its meaning and semantic value, understanding its syntactic behaviour, its forms and derivations and by knowing its meaning and semantic value, as well as its relation with other words, learners must know its place in the overall conceptual knowledge of the language. Thornbury (2002) cited Wilkins saying that: "Without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (p.13).

Learning vocabulary is, in most part, a process in which learners work based on their own resources. The role of the teacher is to provide the appropriate environment for this to take place. Willis (1990) notes that teachers should allow and facilitate the students` management of the vocabulary and help organize their previous knowledge in order for them to be able to make associations. Many students contend that they often forget words they have already learned. Gairns and Redman (1993) present two reasons for that:

1. Lack of practice and review, without that students cannot possibly recall everything they have learned. This is the decay theory.
2. The Cue-dependent forgetting, which means that new words might be still in the memory, but students cannot remember them. It is a retrieval deficiency.

Gillund & Shiffrin (1984) and Raaijmakers & Shiffrin (1981) report experiments that demonstrated that retrieval cues strategies facilitate the recall of the words learned.

The term contextual vocabulary acquisition refers to the ability of learning and understanding the meaning of a word through reasoning. That is possible when learners recognize vocabulary previously seen and make the appropriate connections and inferences about it. This process does not involve assistance from other people or dictionaries. This usually happens when learners are reading a text or watching a film in the target language.

Norbert Schmitt (2005), a professor of Applied Linguistics, suggests eight key points to help students learn lexical items in written and oral production. They are:

1. Build a large sight of vocabulary.
2. Integrate new words with previous words.
3. Provide a number of encounters with a word.

4. Promote deep level of processing.
5. Facilitate imaging.
6. Make new word `real` by connecting them to the students world in some way.
7. Use a variety of techniques.
8. Encourage independent learning strategies

When discussing vocabulary development it is necessary to mention the difference between concrete and abstract words. Concrete language units can be defined as being perceivable and spatial entities, while abstract refers to what “is neither purely physical nor spatially constrained” (BARSALOU & WIEMER-HASTINGS, 2005, p.129, in press). Some investigations on their difference have been conducted, demonstrating that words which refer to concrete ideas are processed faster, and also learned and remembered better than abstract words. The dual code theory by Paivio (1971) postulates that words referring to concrete entities are easier to access than the abstract ones, for the idea they convey contain a verbal and an imagery code, while the abstract ones contain only a verbal code. However, this distinction is often not evident, and when embedded in an appropriate context there might not be real difference in the level of difficulty, as shown by Schwanenflugel and Shoben (1983).

When studying concrete and abstract lexical items, they are oftentimes presented as a pair, comparing the two makes it more logical. Abstracts words are the ones which exists only in our minds and , therefore, cannot be perceived through our senses. It might include ideas, qualities, conditions, theories, states of mind, and similar concepts (KOPPLE 1989). Another theory by Paivio (1986) is that verbal language is mostly located in the language area of the left hemisphere of the brain, while concrete items can be found in both hemispheres. This is another reason why they are believed to be more easily accessed. However, it appears to be a controversial topic, imaging investigations were not able to provide enough clear evidence that the right hemisphere is actually contributing to vocabulary processing (NOPPENY & PRICE, 2004), as defended by the dual code theory.

3. THE STUDY

In my experience as an English as a foreign language teacher, I have always wondered why some students have a hard time acquiring new vocabulary, while others seem to pick it up quite easily. Therefore, I decided to investigate the influence of the working memory capacity on how students perceive, understand and retain vocabulary, in order to be able to use that as a tool to help students become better learners. The success in terms of language fluency, both in native and foreign languages, involves the ability of memorizing sequences of language. Working memory seems to be deeply involved in the process of language access and learning of sequences. Understanding how working memory functions may also allow teachers to understand why and how students have different cognitive skills and abilities as well as different levels of success acquiring languages, in this case, how they could be more efficient in accessing vocabulary items

3.1 Objective

Several measures of phonological loop storage, such as the digit span, have demonstrated a relationship between working memory and lexical access as well as the ability to learn previously unfamiliar words (e.g. ADAMS, BOURKE & WILLIS, 1999; GATHERCOLE & BADDLEY, 1989, 1990; GATHERCOLE & PICKERING, 1999; GATHERCOLE, SERVICE, HITCH, ADAMS & MARTIN, 1999; MICHAS & HENRY, 1994).

Within this context, the objective of this study is to identify the effects of working memory capacity in the performance of a vocabulary access task involving concrete and abstract items, in a group of beginning Brazilian learners of L2 English.

3.2 Hypotheses

Previous studies have suggested that vocabulary attainment and aspects of working memory may be somehow associated, and that one might be determined by the other. Baddeley (1999) and Ellis (2001) argue that vocabulary acquisition development and working memory capacity utilize a

common cognitive skill and that working memory is a strong predictor of positive performance in vocabulary tasks. Based on that, the hypotheses of this study are:

- a) Working memory capacity will positively influence learners' performance on the vocabulary test, confirming that working memory capacity plays an essential role when individuals are asked to respond promptly to recall and reproduce vocabulary items.
- b) Immediate recall of concrete words will be more accurate than of abstract words (PAIVIO & CSAPO, 1969); in addition, the reaction time for the recall of concrete and abstract words will differ, with the concrete words being accessed faster than abstract words.

3.3 Participants

The data collection for this study took place at a public University in Rio Grande do Sul. A total of 27 students took part in this experiment. The participants were adults ranging from the age of 17 to 37, the average age of the students being 22.44. They were enrolled in the second level of English at the Letras course.

The sample was composed of 13 men and 14 women. A total of 18 participants are students, one is a musician, one is an unemployed teacher, one is a computer programmer, one is a public servant and three are research assistants. The age in which they started studying English ranges from 8 to 28 years old, with an average of 13.4. Seven of them studied English in elementary school, high school and in a language course, 9 studied in high school and in a language, 2 studied at home only, 4 studied only in high school, 3 studied only in elementary school, and 2 of them studied only in an English language course. They have studied English for a period between 4 and 18 years, with an average of 10.1 years. Among the participants 4 have studied Spanish as a second language, two have studied Spanish and French, one has studied French, one French and Italian, one has studied Japanese and French, while all the others have studied only English as a second language. Only 4 of the participants speak English at home with either family members or friends, and 5 of them use English in some way at work. From those, the musician uses it all the time, 2 use English often, and one uses it occasionally. Only one participant has lived abroad, in Spain, and no one has ever been to an English speaking country. On the other hand, only one said he never uses English in his leisure time, all the others use it in at least one activity. The activities are: Internet, TV or cinema, reading books or magazines, listening to music and playing video games. A total of nine participants said they use English in four of these activities, six said they use it in five of these,

four use it in six activities, three said they use it in three of these, and two said they use English only when they listen to music. A total of 23 participants said they do these activities daily, two do them often and one, only sometimes. When responding about extra-class study, the options grammar books and exercises, texts books and talking to friends were offered. From those, 11 participants said they use English in two of these situations, seven participants said they use it only with friends, five use only in grammar books, one in all of those, one only in texts books and one does not use it in any extra-class context. ten students answered no when asked if they play video games, while 17 answered yes. From those, six play it sometimes, five play it daily, three play on the weekends, one plays it frequently, one plays only when on vacation, and only one plays it three times a week.

3.4 Consent Form and Questionnaire

All participants tested had previously agreed on taking part on this experiment. They read and signed a consent form (Appendix A). All of the students who were in class agreed to undergo the data collection tests. They also answered a questionnaire (Appendix B) about their overall knowledge of the English language, which included questions such as how long they had studied English, if they used it in any way apart from the University, if they had been abroad and other questions related to their contact with the language. That was done in order to know more about attendants level of proficiency of the language in which they were being tested. Because all Letras` students are supposed to take a placement test before starting their English disciplines, I assumed they had the same level of proficiency.

3.4.1 Materials and Procedures for the Working Memory Test

For this test we used the Battery for Working Memory Assessment (BAMT) test, developed by a team of professors at the Federal University of Minas Gerais, Psychology Department (2001) (Appendix C). For this paper only the linguistic tasks of the BAMT were used, it was decided that the mathematics task would not be relevant for this investigation. The linguistic tasks consisted of three different exercises, being all three double task activities, which will be explained below.

The first exercise contained ten groups of sentences, each group had three columns. The groups started from one line going up to ten lines, adding a line per group consecutively. However, it was decided that the last two groups of nine and ten sentences would not be used for this study, for the level of difficulty in both was too high. In this exercise, the examiner read the sentences aloud while the students had to tick the correct option and memorize the last word of each sentence. After each column of sentences in a group was dictated, the students were asked to write the last word of each sentence in the appropriate space, in the same order they were dictated. There was a time limit for each group depending on the number of sentences it contained.

The second exercise contained lists of single words. There were 8 groups of words with 3 columns each, the groups started from 3 lines of words going up to 10 lines of words. Again, the last 3 groups, which contained columns of 10, 11 and 12 words in a column were removed from the test. The students were supposed to memorize and then write the words down only after the examiner finished dictating each list. They should write the words in the same order as they were read aloud by the examiner. There was a time limit for each group depending on the number of sentences.

The third exercise was a sentence comprehension activity. There were 2 pages, in which there were 2 columns with 25 sentences in each page and one question for each sentence. Both pages contained exactly the same sentences and questions. The students should read the sentences and tick the appropriate responses. There was a time limit of 20 seconds per page, after this time they were not allowed to answer any more questions.

The BAMT was applied in groups. In the first group, a large number of students had problems understanding the test instructions and were eliminated from the sample.

The first group of students was tested on September 22nd. There was a total of 24 students in class that day, however, one student arrived after the test had started, for this reason she was not included in the experiment. Firstly, they were given a brief overview of the study; then they were asked to sign the consent form and fill out the questionnaire. After that, we explained how the test was supposed to be done, only after they said they had thoroughly understood the instructions we started applying it. The first block of sentences was done as an example, as to be sure the students knew how to do it properly. Then we continued with the sentences. However, during the 4th block of sentences we realized some of them were confused about the instructions, as they were writing the words before the moment they were supposed to. At this point, we explained the instructions again and asked the ones who had not done it correctly up to this moment to put an asterisk next to their name on the first page of the test. Then we proceeded with the testing. From the beginning to

the end of the test there was a period of approximately 45 minutes. When the test was finished, there was a total of 14 tests with asterisks, and 09 without it, which meant that more than half of the students had not done it properly; therefore, they had to be disregarded.

The second testing session was conducted on October 31st. There was a total of 14 students in class. The same procedures were followed. They also signed the consent form and filled out the questionnaire. Again, a brief overview was given followed by an extensive explanation of how the test should be done, as to make sure all of them would do it according to the way it was supposed to be. Then we proceeded with the test, this time reinforcing after each set of sentences that they should write only when we said they could. It also took them about 45 minutes to complete the entire procedure.

As there were a few missing students on the second day of test, another testing session had to be done the following week, this time with four students only. That way, a total of 27 students composed the sample.

3.5.2 Materials and Procedures for the Vocabulary Test

The vocabulary test, designed in *E-prime*³, consisted of the translation of 38 single words in English, nouns and verbs. The list was composed of 19 abstract words and 19 concrete words. All the words were chosen by professor Ana B. Areas da Luz Fontes, Postdoctoral Research Fellow (2010-2011), Federal University of Rio Grande do Sul. The words contained no ambiguity and no cognates neither in English, nor in Portuguese. The average length of the words was 6 letters.

The test was done individually. Firstly, the instructions in Portuguese were read to the participants while they followed the instructions on the computer screen. If they had no further questions about how to perform the test, they could start it. A total of 38 words in English were presented on the screen, one by one. After 04 seconds, the word disappeared, the student should say the translation for the word in Portuguese, and their answers were recorded. In case they did not know any translation for the word on the screen they should say “no”. After 10 seconds, a sentence asking the participant to say any other translation they might know appeared on the screen, and they were instructed to say it if they knew another word. However, as very few words contained more

³ E-Prime® is a suite of applications for computerized experiment. E-Prime® provides computerized experiment design, data collection, and analysis. It also provides millisecond precision timing for the accuracy of data.

than one translation given by the participants, I decided that only the first translation would be taken into account in the data analysis; therefore, the second or third words were simply ignored. Also, the *E-prime* program test did not measure the reaction time for more than one word. After 10 seconds, a + (plus) sign appeared on the screen. When the participant was ready, he should press the space button to go to the next word. The test was recorded to be transcribed later. After the tests were finished, a transcription of each participant was made, and then they were corrected and received 1 (one) point for each correct word and 0 (zero) for each incorrect one. Their reaction times for each word were also measured.

4. RESULTS

In this chapter the results of the study will be presented and discussed. In section 3.1, the accuracy results in the vocabulary test and the working memory test will be analyzed and discussed. In section 3.2, the results for the reaction time measures in the vocabulary test and working memory test will be explained.

It is important to note that in the final analysis data from only 20 participants were considered and measured. Participants who scored under 63% in the vocabulary test were disregarded. The following results were found.

4.1 Accuracy and Working Memory Analysis

Table 1 below presents the total mean accuracy scores as well as the mean results for both concrete and abstract words. As we can see, participants had higher scores for the abstract words than for the concrete words. In order to see if this difference was significant, a Repeated Measures Analysis of Variance (ANOVA) with scores for accuracy for both concrete and abstract words and for working memory as a covariate was carried out. The analysis revealed a main effect for concreteness, which means that there is a significant difference between the scores for concrete and abstract nouns and verbs ($F(1,25) = 7.056, p = .014$). However, no interaction between concreteness and working memory was found ($p = .548$). This means that working memory scores did not affect accuracy results for neither concrete nor abstract words in the vocabulary test.

Table 1: Mean Score and Standard Deviation (SD) for Concrete and Abstract Words in the Vocabulary Test

	Mean Score	SD
Concrete	67%	.1388
Abstract	73%	.1381
Total	70%	.1384

4.2 Reaction Time and Working Memory Analysis

Table 2 below shows the mean reaction times and standard deviations for all the words combined and also for concrete and abstract words separately. The translations for the abstract words were uttered faster by the participants than the translations for the concrete words. A Repeated Measures ANOVA with scores for accuracy for both concrete and abstract words and for working memory as a covariate was also carried out to see whether there as a significant difference between these measures. The analysis revealed no difference between the reaction time for concrete versus abstract nouns and verbs. In addition, no effect of working memory capacity correlated to the reaction time was found.

Table 2 – Mean Reaction Time (in ms.) and Standard Deviation of Concrete and Abstract Words

	Mean RT	SD
Concrete	1231.5	291.6
Abstract	1114.2	326.5
Total	1172.8	309.0

4.3 Discussion

The research study reported in this paper investigated the effects of working memory capacity on vocabulary access. A task in which participants were asked to give translations to a group of concrete and abstract words in English was designed and accuracy and reaction time measures were recorded.

The first hypothesis was that working memory capacity would positively influence learners' performance on the vocabulary test, trying to confirm that working memory capacity plays an essential role in the recall and reproduction of vocabulary items. That notion was grounded on studies that show how working memory is considerably involved in vocabulary learning and access. The reason for this conviction is that working memory is a short-term capacity to process, manipulate and analyze information. Measures of phonological loop, such as the digit span, have demonstrated a link between working memory and lexical access (e.g. ADAMS, BOURKE & WILLIS, 1999; GATHERCOLE & BADDELEY, 1989; 1990; GATHERCOLE & PICKERING,

1999; GATHERCOLE, SERVICE, HITCH, ADAMS & MARTIN, 1999; MICHAS & HENRY, 1994). Therefore, it was expected to influence vocabulary access positively. This hypothesis, however, was not confirmed in this study. As mentioned before, In Engle's view (2002), working memory is the ability to use this attention to keep information in such a way that it could be assessed when needed. Perhaps one of the reasons the first hypothesis was not confirmed is for the fact that students were not paying enough attention to the task, they might not have been as committed as it would be necessary for this experiment.

The second hypothesis of this study was that the immediate recall of lists of concrete words would be faster and more accurate than for abstract words (PAIVIO & CSAPO, 1969), based on the assumption that concrete words create a mental imagery of the lexical item in the memory and therefore are accessed more promptly. The dual code theory by Paivio (1971) assumes that words referring to concrete entities are easier to acquire than the ones that refer to abstract entities, for the idea they convey contain a verbal and an imagery code, while the abstract words contain only a verbal code. This distinction might not often be evident, and when embedded in an appropriate context there may not be a real difference in the level of difficulty, as shown by Schwanenflugel & Shoben (1983). However, in the vocabulary test used in this paper no context, phrase or chunk was provided, that should be another reason why the second hypothesis was expected to be confirmed. Based upon this concept, the concrete words were expected to score higher in the test than the abstract ones. Nonetheless, the results found pointed in the opposite direction. The abstract words presented in the test obtained a higher score of accuracy than the concrete ones. Also comparing the reaction time of the concrete versus the abstract items, no relevant difference was found, thus, not confirming the original hypothesis. Imaging investigations were not able to provide enough evidence that the right hemisphere is actually contributing to vocabulary processing (NOPPENNEY & PRICE, 2004), as defended by the dual code theory; this might support the results found in this experiment.

4.4 Final Considerations

The road to finding how language acquisition is processed in the learner's mind is a long one. Although a great number of research studies have been conducted to try to find out more about cognitive operations and their functions in the brain, there is still a lot to be studied in this field. In

order for teachers to be able to help students in their path towards L2 development and facilitate this process further studies should be done.

In my experience, investigations which involve the participation of volunteers are never easy to be carried out. All participants must be willing to go through the extensive battery of tests, something that demands time and patience from them, to compose the data collection necessary to organize the study. Those participants should be cooperative as well, in order for the data to be reliable. They must not only accept to take part in the experiment, but also try to give the best of their knowledge

One of the things I could observe while applying the tests was that if instructions are not thoroughly given and reinforced, the entire work can be damaged. As mentioned in Chapter 2, some students had to be left out of the investigation for not doing the test according to the instructions. Fortunately, the mistakes were observed and the tests were removed from the data. However, it is impossible to be completely sure and guarantee that all participants did as best as they could, following the instructions as well as responding accurately according to their real understanding of the target language. Still, it is necessary to rely on that information as to be able to conduct a research study. The best alternative would be taking the test in groups of 4 or 5 students at a time, instead of groups of 20 or 30 students. That way it is possible to observe whether or not they are following the instructions accordingly.

A limitation that should be noted was the number of participants taking part of the data collection. For a more accurate analysis a greater number of participants would be desirable. Yet, for the reasons already mentioned, only 20 participants, out of the 30 initially expected, were considered in the analysis conducted for this paper.

Also, because the participants were from the second semester of the Letras Course they had different backgrounds and a varied experience with the English language, as opposed to a more advanced level of students, who have been at the same university for a longer period. That could be one reason to explain why the results were inconsistent and did not meet the expectations. The fact that the participants were beginners might have contributed to this. A more advanced group, with a greater knowledge of the target language, would possibly be more affected by their working memory capacity.

Another point that should be taken into account is the selection of the words used in the vocabulary test. All nouns and verbs were carefully chosen. However, it is not possible to know for sure which words the participants had been previously taught. In a situation where the words had

been taught, practiced along the semester and then checked for access, we would be more precise in measuring the accuracy for abstract and concrete words. Unfortunately that was not possible.

Certainly, further investigations in this area must be conducted with Brazilian students of English as a foreign language to find out more precisely the correlation between working memory and vocabulary access as well as how differently concrete and abstract lexical items are accessed, how learners respond to those items when required to, and to what extent can working memory predict language access, and more specifically, L2 lexical access. Another point to be considered in future studies is whether all types of learners are directly affected by working memory capacity, or some might be more influenced by other factors. And again, what kind of L2 learners respond better to concrete lexical items, and what kind respond better to abstract ones, if any. After all, not all learners are the same.

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Appendix A – Consent Form

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL
INSTITUTO DE LETRAS - DEPARTAMENTO DE LÍNGUAS
MODERNAS

PROFA. DRA. INGRID FINGER

Participante n° _____

FORMULÁRIO DE CONSENTIMENTO

Por favor, leia o parágrafo a seguir e assine na linha abaixo, indicando que você entende a natureza deste estudo e seus direitos como participante.

A participação neste estudo é voluntária. Neste estudo, o participante será solicitado a realizar uma tarefa de associação semântica no computador. No teste, palavras serão apresentadas em inglês no centro da tela do computador e o participante deverá pensar em possíveis sinônimos.. Vale ressaltar, ainda, que este não é um teste de inteligência. Além disso, o estudo não envolve risco algum. Todos os resultados coletados durante a participação serão codificados com um número de identificação, ou seja, os nomes dos participantes não serão divulgados.

Eu li e entendi a informação acima a respeito deste estudo e concordo em participar.

NOME

ASSINATURA

DATA _____

Appendix B – Participants Questionnaire

Prezado participante do estudo:

Por favor, preencha as lacunas abaixo e responda às perguntas:

(1) Idade: _____ (2) Sexo: () F () M

(3) Profissão (se for professor(a), especifique a série, a disciplina e o local de trabalho): _____

(4) Há quantos anos você estuda inglês? _____

(5) Você fala outras línguas em casa além do português

() SIM () NÃO

(6) Quais (caso tenha respondido SIM na questão anterior)

(7) Quanto tempo você estudou essa(s) língua(s) (caso tenha respondido SIM na questão anterior)? _____

8) Você utiliza o inglês em seu local de trabalho?

() SIM () NÃO

(9) Com que frequência (caso tenha respondido SIM na questão anterior)?

() sempre () frequentemente () às vezes

() raramente

(10) Você já morou no exterior? () SIM () NÃO

(11) Em que país (caso tenha respondido SIM na questão anterior)?

(12) Por quanto tempo (caso tenha respondido SIM na questão anterior)?

13) Você já viajou para o exterior? () SIM () NÃO

(14) Para onde e por quanto tempo (caso tenha respondido SIM na questão anterior)? _____

(15) Você utiliza o inglês em seus momentos de lazer?

() SIM () NÃO

(16) Em que atividades (caso tenha respondido SIM na questão anterior)?

() internet () televisão/cinema () leitura de livros/revistas

() ouvir música () vídeo games () outros _____

(17) Com que frequência (caso tenha respondido SIM na questão anterior)?

(18) Seu estudo extra-classe consiste em:

() estudar e praticar as estruturas da língua em livros de exercícios e gramáticas

() conversar com amigos e colegas que falam inglês

() ler as unidades do livro-texto trabalhadas em aula

() não tenho o hábito de estudar fora do contexto de sala de aula

(19) Você joga vídeo games? () sim () não

(20) Com que frequência (caso tenha respondido sim)?

MUITO OBRIGADO POR PARTICIPAR DO EXPERIMENTO!!

Appendix C – Working Memory Test**Bateria de Avaliação da Memória de Trabalho - BAMT****Caderno B**

Nome:.....

Data:...../...../..... Idade:..... Sexo: (M)/(F)

Escolaridade (anos):.....

Não abra ainda este caderno!

Quando autorizado pelo aplicador, abra o caderno na página que lhe for indicada e preste atenção ao que for pedido fazer. Use lápis ou caneta para responder as questões. Não é necessário utilizar borracha.

Não escreva no espaço abaixo. Ele é reservado para a correção de seu teste.

Nº do teste	
ALCESC	
APRP	
CPRSENT	

Quem? () O galo () Juca () Óculos	Pôs o quê? () O ovo () O cachorro () O vento	Quem? () O namorado de Eunice () João () O tio de Eunice
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Quando? () Na sexta-feira () No mês passado () Ontem	Quem informou? () O Diretor () O repórter () A secretária	Quem? () O homem () O garoto () A menina
Quem? () Papai () O cachorro () Cecília	Quando? () Semana que vem () Ontem () De manhã	Recebeu o quê? () A mesa () Notícias () O caixa

Quem? () Os peões () Eu () O dono da terra	O quê? () A qualidade de vida () As curvas () As florestas	Quem? () Suas amigas () Maria () Sua tia
Onde? () No banco () Longe da rua () Perto da praça	Procurava quem? () Serviço () Casas () Amélia	Recebeu o quê? () Um bilhete () Um cheque () A roupa
Quem sabe? () Seu amiguinho () O homem () Pedro	Desceu de onde? () Da escada () Do poste () Do ônibus	Quem? () O médico () Mamãe () Eu

A maior parte do quê? () Da cerca () Dos marinheiros () Dos assuntos	Quem elogiou? () A professora () A menina () Os meninos	Quem? () O ladrão () Celso () A multidão
Quem? () Marina () A cunhada () Cláudia	Quando? () Durante a semana () Ontem () Hoje	Exigiu de quem? () De seu secretário () Do senador () Do motorista
Quem? () Os plantadores () O gato () O seu vizinho	Confiou o quê? () Jóias () Passarinho () Barco	Quem? () Um garoto () Rogério () Um amigo
Como? () Bem () Amarrotado () De calção	Deu o quê? () Trabalho () Alegrias () Dinheiro	Onde? () No serviço () No passeio () Nos feriados

Quem pensou? () O remo () Ela () O cachorro	_____	Perguntou o quê? () A matéria () Meu nome () O preço	_____	Quem? () A garota () Nossa tia () Todos	_____
Quem? () O livro () O repórter () Armando	_____	Quem? () Marcela () O gato () O rato	_____	O quê? () Paulo () O carro () A casa	_____
Amiguinhos de quem? () Tiago () Carro () Marta	_____	Dependemos de quê? () Do açúcar () Do cozinheiro () Do molho	_____	Quem? () O professor () As plantas () A zeladora	_____
Para o quê? () Bolo () Construção () Envelope	_____	Quanto tempo? () Uns minutos () A noite inteira () Horas	_____	O quê do Afonso? () Primo () Cunhado () Um vizinho	_____
Quem? () Pérola () O motorista () Papai	_____	Quem o abandonou? () João () O partido () À vegetação	_____	Quem? () O porteiro () O homem () O leão	_____

Que beijou quem? () Saci () Cordélia () Afonso	_____	Quando? () Toda semana () Sábado () Nas férias de Julho	_____	Quem? () Dona Maria () O modelo () Os índios	_____
Quem? () Os macacos () Muitas rochas () Terra	_____	Quem? () Os meninos () O treinador () O padre	_____	Quem gosta de gado? () Os homens () O patrão () A natureza	_____
Quando? () Ontem () Na semana passada () Hoje	_____	Quantos filhos? () Metade () Todos () Apenas um	_____	Tio de quem? () Do menino () De Raquel () De um amigo	_____
Deu o quê? () Animais () Um carro () Uma ilha	_____	De onde? () Da escola () Do orelhão () De casa	_____	Quem? () O camelo () Os três () Os dois	_____
Quem? () João () Ela () Laura	_____	Quem explicou? () Todos os garotos da rua () A professora () Eu	_____	Quantos convidados? () Só os amigos () Todos () Alguns	_____
Ministro de quê? () Minas e Energia () Transportes () Agricultura	_____	Garoto o quê? () Apressado () Dormindo () Com raiva	_____	O quê? () O carro () O gato () A luz	_____

Quem pensou? () O remo () Ela () O cachorro	_____	Perguntou o quê? () A matéria () Meu nome () O preço	_____	Quem? () A garota () Nossa tia () Todos	_____
Quem? () O livro () O repórter () Armando	_____	Quem? () Marcela () O gato () O rato	_____	O quê? () Paulo () O carro () A casa	_____
Amiguinhos de quem? () Tiago () Carro () Marta	_____	Dependemos de quê? () Do açúcar () Do cozinheiro () Do molho	_____	Quem? () O professor () As plantas () A zeladora	_____
Para o quê? () Bolo () Construção () Envelope	_____	Quanto tempo? () Uns minutos () A noite inteira () Horas	_____	O quê do Afonso? () Primo () Cunhado () Um vizinho	_____
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Que beijou quem? () Saci () Cordélia () Afonso	_____	Quando? () Toda semana () Sábado () Nas férias de Julho	_____	Quem? () Dona Maria () O modelo () Os índios	_____
Quem? () Os macacos () Muitas rochas () Terra	_____	Quem? () Os meninos () O treinador () O padre	_____	Quem gosta de gado? () Os homens () O patrão () A natureza	_____
Quando? () Ontem () Na semana passada () Hoje	_____	Quantos filhos? () Metade () Todos () Apenas um	_____	Tio de quem? () Do menino () De Raquel () De um amigo	_____
Deu o quê? () Animais () Um carro () Uma ilha	_____	De onde? () Da escola () Do orelhão () De casa	_____	Quem? () O camelo () Os três () Os dois	_____
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Ministro de quê? () Minas e Energia () Transportes () Agricultura	_____	Garoto o quê? () Apressado () Dormindo () Com raiva	_____	O quê? () O carro () O gato () A luz	_____

<p>Quem? <input type="checkbox"/> À janela <input type="checkbox"/> Paulo <input type="checkbox"/> Os meninos</p>	<p>Quem disse? <input type="checkbox"/> Aurélio <input type="checkbox"/> A gerência <input type="checkbox"/> Ninguém</p>	<p>Esperou quem? <input type="checkbox"/> Luís <input type="checkbox"/> Alberto <input type="checkbox"/> Um amigo</p>
<p>Fez o quê? <input type="checkbox"/> Suspirou <input type="checkbox"/> Embriagou-se <input type="checkbox"/> Perdeu-se</p>	<p>Vizinha de quem? <input type="checkbox"/> Do padeiro <input type="checkbox"/> Do jornalista <input type="checkbox"/> Do papai</p>	<p>Procuram quem? <input type="checkbox"/> A casa <input type="checkbox"/> Seu tio <input type="checkbox"/> A avenida</p>
<p>Quem? <input type="checkbox"/> Eulália <input type="checkbox"/> Minha tia <input type="checkbox"/> Roberto</p>	<p>Quem? <input type="checkbox"/> Pedro <input type="checkbox"/> Seu filho <input type="checkbox"/> O bombeiro</p>	<p>Quem da oficina? <input type="checkbox"/> O dono <input type="checkbox"/> O aluno <input type="checkbox"/> Ninguém</p>
<p>De onde? <input type="checkbox"/> Daquele bairro <input type="checkbox"/> Da esquina <input type="checkbox"/> Da cidade</p>	<p>Quem? <input type="checkbox"/> A filha do Aldir <input type="checkbox"/> O porco <input type="checkbox"/> Aldir</p>	<p>Quem o surpreendeu? <input type="checkbox"/> A lancha <input type="checkbox"/> O anzol <input type="checkbox"/> O peixe</p>
<p>Quem encontrou? <input type="checkbox"/> Vocês <input type="checkbox"/> Eustáquio <input type="checkbox"/> A escola</p>	<p>Tinha o quê? <input type="checkbox"/> Os brinquedos <input type="checkbox"/> Farofa <input type="checkbox"/> Um barco</p>	<p>Convenceu quem? <input type="checkbox"/> Animais <input type="checkbox"/> Zezé <input type="checkbox"/> O dono do bar</p>
<p>Quem a espera? <input type="checkbox"/> O táxi <input type="checkbox"/> Seu colega <input type="checkbox"/> A amiga</p>	<p>Quando? <input type="checkbox"/> No ano passado <input type="checkbox"/> Ontem <input type="checkbox"/> Sábado</p>	<p>Entregou o quê? <input type="checkbox"/> Os documentos <input type="checkbox"/> Um carro <input type="checkbox"/> Açúcar</p>
<p>Juntou o quê? <input type="checkbox"/> A lenha <input type="checkbox"/> Água <input type="checkbox"/> O amigo</p>	<p>Quem? <input type="checkbox"/> Uma tia <input type="checkbox"/> Ruth <input type="checkbox"/> Edinéia</p>	<p>Quem? <input type="checkbox"/> Papai <input type="checkbox"/> Os moradores <input type="checkbox"/> O homem</p>

Filho de quem? () Ninguém () Do caseiro () Do padeiro	_____	Quem surpreende? () Seu marido () Leão () O lenço	_____	Onde? () Na pia () No tanque () No rio	_____
Quando? () Domingo () Sábado () No parque	_____	Filho de quem? () Maria () Da fazendeira () Da professora	_____	Vendeu o que? () A casa velha () O sítio () O perfume	_____
Quem? () A roupa () O professor () Ana	_____	Dedicou o que? () A casa () A planta () A vitória	_____	Adversário de quem? () Do piloto () Do coelho () Do enxadrista	_____
Quem? () A moça () O homem () O ator	_____	Quem? () A coruja () A moça da padaria () A dona do carro	_____	Quem? () Ele () A menina () O cientista	_____
Adora o que? () Correr () Brincar () Pular	_____	Quem espera? () O gato () O menino () O dançarino	_____	Quem? () As horas () O filho () Vinícius	_____
Quem? () A maquiagem () Marcela () O cabelo	_____	Quem? () Joana () Flávia () A mesa	_____	Pegar o que? () O chapéu () O sapato () A bola	_____
Sobrinha de quem? () Do pássaro () Da tia () Do palhaço	_____	Limpou o que? () A casa () O envelope () O quarto	_____	Quem? () Tiago () O pai () Eu	_____
Quem? () O médico () O técnico () A mamadeira	_____	Quem? () O aluno () João () O menino	_____	Quem? () O telefone () A pasta () O homem	_____

Cantou com quem? () A parede () A banda () Os meninos	Confessou o que? () O pecado () O medo () O defeito	Marido de quem? () Maria () Joana () Minha tia
Puxou o que? () A carroça () O homem () O carro	Estagiária de que? () Enfermagem () Pedagogia () Educação física	Deu o que? () Um presente () Uma bala () Um prato
Quem? () Minha mãe () Ela () A secretária	Quem? () O pedreiro () A mulher () A modelo	Quem viu? () O piano () O bicho () A aranha
Durante o que? () A colheita () O dia () A semana	Quem? () A moça () Raquel () Dentista	Não fez o que? () Obedeceu () Bateu () Cortou
Avó de quem? () Mariana () Pedro () Ana	Onde? () No ônibus () Na escola () No carro	Quem comprou? () Seu pai () O namorado () O tio
Quando? () De madrugada () Pela manhã () Na cama	Quem? () O rato () O homem () O marinheiro	Pagou o que? () O salário () O sapato () O almoço
Fez o que? () Lavou () Consertou () Pintou	Cabelereiro de quem? () Mamãe () Do gato () Minha tia	Quem? () A loja () O prédio () O menino
Quando? () De dia () Durante a aula () No clube	Mora onde? () Curitiba () Belo Horizonte () Brasília	Devolveu a quem? () Ao Luís () Ao secretário () Ao professor
Quem brinca? () A freira () Todos () Paulinho	Quem? () Cachorro () Clara () Cecília	Quem? () O papai () A raposa () A tia

COMPREENSÃO DE FRASES

Os meninos brincaram muito de peteca e de bola.

Quem?

- () À janela
 () Paulo
 () Os meninos

Os vaqueiros sabem que o patrão gosta de gado.

Quem gosta de gado?

- () Os homens
 () O patrão
 () A natureza

A qualidade de vida se revelou boa naquela ilha.

O quê?

- () A qualidade de vida
 () As curvas
 () As florestas

Sempre me surpreendo com tanta terra.

Quem?

- () Os peões
 () Eu
 () O dono da terra

Os meninos queriam ganhar o jogo.

Quem?

- () Os meninos
 () O treinador
 () O padre

O médico que tinha um barco nos ajudou na cheia.

Tinha o quê?

- () Os brinquedos
 () Farofa
 () Um barco

O partido do senador exigiu dele um sinal.

Exigiu de quem?

- () De seu secretário
 () Do senador
 () Do motorista

Aquela senhora recebeu um bilhete e procurou o moço.

Recebeu o quê?

- () Um bilhete
 () Um cheque
 () A roupa

Madalena lembrou que vocês encontraram o bicho.

Quem encontrou?

- () Vocês
 () Eustáquio
 () A escola

Suas amigas acham que se confundiram com a roupa.

Quem?

- () Suas amigas
 () Maria
 () Sua tia

Ontem, João Ricardo capinou todo o mato.

Quando?

- () Na sexta-feira
 () No mês passado
 () Ontem

Ele entregou os documentos ao porteiro da noite.

Entregou o quê?

- () Os documentos
 () Um carro
 () Açúcar

No comício, todos devem ficar antes da faixa.

Quem?

- () A garota
 () Nossa tia
 () Todos

De casa, Lúcia telefonou ao pai.

De onde?

- () Da escola
 () Do orelhão
 () De casa

Sua tia confiou a chave ao vizinho.

Confiou o quê?

- () Jóias
 () Chave
 () Barco

Todos os meus filhos fazem o dever de casa.

Quantos filhos?

- () Metade
 () Todos
 () Apenas um

Pedro sabe que seu amiguinho perdeu o papel.

Quem sabe?

- () Seu amiguinho
 () O homem
 () Pedro

Para o bolo, precisamos de leite.

Para o quê?

- () Bolo
 () Construção
 () Envelope

O ladrão tentou levar o dinheiro do caixa.

Quem?

- () O ladrão
 () Celso
 () A multidão

Mariana devolveu o carro com defeito para a loja.

O quê?

- () Paulo
 () O carro
 () A casa

O primo do Afonso perdeu o baile.

O quê do Afonso?

- () Primo
 () Cunhado
 () Um vizinho

Hoje, o chefe de vendas apresentou o novo milho.

Quando?

- () Durante a semana
 () Ontem
 () Hoje

Agora só dependemos do molho para o pato.

Dependemos de quê?

- () Do açúcar
 () Do cozinheiro
 () Do molho

A galinha pôs o ovo e saiu do ninho.

Pôs o quê?

- () O ovo
 () O cachorro
 () O vento

Todos os convidados receberam um brinde e uma rosa.

Quantos convidados?

- () Só os amigos
 () Todos
 () Alguns

Universidade Federal de Minas Gerais
Faculdade de Filosofia e Ciências Humanas
Departamento de Psicologia
Laboratório de Neuropsicologia do
Desenvolvimento

Bateria de Avaliação da Memória de Trabalho

Livro de Tarefas e Instruções para
Aplicação em Grupos
Belo Horizonte

1999

Escreva no Quadro-Negro

- 1- Trabalhe em silêncio.
- 2- Não fale durante a aplicação do teste.
- 3- Não podemos repetir os problemas. Se você perdeu algum, não faz mal, continue. O teste é grande.
- 4- Teste individual

Atenção!!! Não leia o que estiver escrito em negrito nas páginas seguintes. São orientações apenas para o aplicador.

1- Alcance de Computação

A tarefa é:

Resolver problemas matemáticos e ao mesmo tempo memorizar números.

As alternativas para cada problema estão dentro de molduras.

À medida que cada problema for lido, marque um "x" na resposta correta. Ao mesmo tempo, memorize o segundo número de cada problema.

Quando eu disser "podem transcrever", anatem os números memorizados no espaço sublinhado ao lado do problema correspondente .

A ordem é importante.

Lembrem-se: não vale anotar os números nos espaços sublinhados antes de eu dizer "podem transcrever".

4- Alcance de Apreensão na Escrita

A tarefa é:

Responder perguntas e ao mesmo tempo memorizar palavras.

As alternativas para cada problema estão dentro de molduras.

À medida que cada frase for lida, marque um "x" na resposta correta. Ao mesmo tempo, memorize a última palavra de cada frase.

Quando eu disser "podem transcrever", anotem as palavras memorizadas no espaço sublinhado ao lado do problema correspondente .

A ordem é importante.

Lembrem-se: não vale anotar as palavras nos espaços sublinhados antes de eu dizer "podem transcrever".

ALCANCE DE COMPUTAÇÃO NA ESCRITA

Listas de 1 frase (marque 4 segundos)

Juca exigiu do vendedor uma mesa. Quem?

O galo

Juca b

Óculos

A galinha pôs o ovo e saiu do ninho. Pôs o quê?

O ovo a

O cachorro

O vento

O namorado de Eunice a beijou no meio da vila. Quem?

O namorado de Eunice a

João

O tio de Eunice

Listas de 2 frases (marque 8 segundos)

Ontem, João Ricardo capinou todo o mato. Quando?

Na sexta-feira

No mês passado

Ontem c

Durante o blecaute, Cecília procurou por uma vela. Quem?

Papai

O cachorro

Cecília c

A secretária informou que o diretor lhe contou tudo.	Quem informou?
O Diretor	
O repórter	
A secretária	c
De manhã, a menina alimentou o gato.	Quando?
Semana que vem	
Ontem	
De manhã	c

A menina lembrou que não se penteou depois do banho.	Quem?
O homem	
O garoto	
A menina	c
Heloísa recebeu notícias de sua mãe. Recebeu o quê?	
A mesa	
Notícias	b
O caixa	

Listas de 3 frases (marque 12 segundos)

Sempre me surpreendo com tanta terra. Quem?

Os peões

Eu b

O dono da terra

Longe da rua o menino pode empinar a pipa. Onde?

No banco

Longe da rua b

Perto da praça

Pedro sabe que seu amiguinho perdeu o papel. Quem sabe?

Seu amiguinho

O homem

Pedro c

A qualidade de vida se revelou boa naquela ilha. O quê?

A qualidade de vida a

As curvas

As florestas

O carteiro que procurava Amélia olhou no mapa. Procurava quem?

Serviço

Casas

Amélia c

A moça desceu do ônibus e tomou um táxi. Desceu de onde?

Da escada

Do poste

Do ônibus

c

Suas amigas acham que se confundiram com a roupa. Quem?

Suas amigas

a

Maria

Sua tia

Aquela senhora recebeu um bilhete e procurou o moço. Recebeu o quê?

Um bilhete

a

Um cheque

A roupa

Eu pedi uma salada e recebi uma sopa. Quem?

O médico

Mamãe

Eu

c

Listas de 4 frases (marque 16 segundos)

A maior parte dos marinheiros se empenha no navio. A maior parte do quê?

Da cerca

Dos marinheiros b

Dos assuntos

Marina se comportou muito bem na aula. Quem?

Marina a

A cunhada

Cláudia

Os plantadores acreditam que se beneficiarão com a próxima chuva. Quem?

Os plantadores a

O gato

O seu vizinho

Zé do Bode se veste bem em dia de lua. Como?

Bem a

Amarrotado

De calção

A professora elogiou Carla e sua saia. Quem elogiou?

A professora a

A menina

Os meninos

Hoje, o chefe de vendas apresentou o novo milho. Quando?

Durante a semana

Ontem

Hoje

c

Sua tia confiou as jóias ao hotel. Confiou o quê?

Jóias

a

Passarinho

Barco

A casa que me deu alegrias pertence ao meu avô. Deu o quê?

Trabalho

Alegrias

b

Dinheiro

O ladrão tentou levar o dinheiro do caixa. Quem?

O ladrão a

Celso

A multidão

O partido do senador exigiu dele um sinal. Exigiu de quem?

De seu secretário

Do senador b

Do motorista

Rogério descobriu que a merenda era bolo. Quem?

Um garoto

Rogério b

Um amigo

No serviço, Amanda sempre obedeceu ao chefe. Onde?

No serviço a

No passeio

Nos feriados

Listas de 5 frases (**marque 20 segundos**)

Ela pensou que sua tia lhe venderia uma cama. Quem pensou?

O remo

Ela b

O cachorro

O repórter informou que aquilo não era um sapo. Quem?

O livro

O repórter

b

Armando

Os amiguinhos de Tiago gostaram do bolinho de peixe. Amiguinhos de quem?

Tiago

a

Carro

Marta

Para o bolo, precisamos de leite. Para o quê?

Bolo

a

Construção

Envelope

O motorista sabe que se enganou de rua. Quem?

Pérola

O motorista

b

Papai

Dona Sinhá perguntou o preço e levou um choque. Perguntou o quê?

A matéria

Meu nome

O preço c

O rato comeu o pedaço de queijo. Quem?

Marcela

O gato

O rato c

Agora só dependemos do molho para o pato. Dependemos de quê?

Do açúcar

Do cozinheiro

Do molho c

A noite inteira, Totó roeu o osso. Quanto tempo?

Uns minutos

A noite inteira b

Horas

O presidente admite que o partido o abandonou sem pena. Quem o abandonou?

João

O partido b

À vegetação

No comício, todos devem ficar antes da faixa. Quem?

A garota

Nossa tia

Todos

c

Mariana devolveu o carro com defeito para a loja. O quê?

Paulo

O carro

b

A casa

O professor se lembrou daquela moça. Quem?

O professor

a

As plantas

A zeladora

O primo do Afonso perdeu o baile. O quê do Afonso?

Primo

a

Cunhado

Um vizinho

O porteiro disse que se feriu na mão. Quem?

O porteiro

a

O homem

O leão

Listas de 6 frases (marque 24 segundos)

A menina que beijou Afonso tem um anel no dedo. Que beijou quem?

Saci

Cordélia

Afonso c

Os macacos se espalham por toda a mata. Quem?

Os macacos a

Muitas rochas

Terra

Hoje os alunos da 4ª série ensaiam a peça. Quando?

Ontem

Na semana passada

Hoje c

Alfredo deu um belo carro à filha. Deu o quê?

Animais

Um carro b

Uma ilha

Ela não encontrou nem Luísa nem seu cão. Quem?

João

Ela b

Laura

O ministro da Agricultura não gosta de café. Ministro de quê?

Minas e Energia

Transportes	
Agricultura	c

Nas férias de julho eles vão passear na roça. Quando?

Toda semana

Sábado

Nas férias de julho c

Os meninos queriam ganhar o jogo. Quem?

Os meninos a

O treinador

O padre

Todos os meus filhos fazem o dever de casa. Quantos filhos?

Metade

Todos b

Apenas um

De casa, Lúcia telefonou ao pai. De onde?

Da escola

Do orelhão

De casa c

Expliquei que meus tios me levaram à praia. Quem explicou?

Todos os garotos da rua

A professora b

Eu

O garoto apressado jogou fora o papel e a bala. Garoto o quê?

Apressado a

Dormindo

Com raiva

Dona Maria costuma ajudar o filho. Quem?

Dona Maria a

O modelo

Os índios

Os vaqueiros sabem que o patrão gosta de gado. Quem gosta de gado?

Os homens

O patrão b

A natureza

O tio do menino pediu a ele outra folha. Tio de quem?

Do menino a

De Raquel

De um amigo

Os dois aguardam a chegada do bebê. Quem?

O camelo

Os três

Os dois c

Todos os convidados receberam um brinde e uma rosa. Quantos convidados?

Só os amigos

Todos b

Alguns

A luz se refletiu num caco. o quê?

O carro

O gato

A luz

c

Listas de 7 frases (marque 28 segundos)

Os meninos brincaram muito de peteca e de bola. Quem?

À janela

Paulo

Os meninos c

Aquele homem afirma que se perdeu no meio do povo. Fez o quê?

Suspirou

Embriagou-se

Perdeu-se c

Minha tia gosta de torta de pêra. Quem?

Eulália

Minha tia b

Roberto

O cinema da cidade já exibiu aquele filme. De onde?

Daquele bairro

Da esquina

Da cidade c

Madalena lembrou que vocês encontraram o bicho. Quem encontrou?

Vocês a

Eustáquio

A escola

Maria acha que o táxi a espera depois da feira. Quem a espera?

O táxi a

Seu colega

A amiga

O velho juntou a lenha e acendeu o fogo. Juntou o quê?

A lenha

a

Água

O amigo

Ninguém disse que o padre vinha de carro. Quem disse?

Aurélio

A gerência

Ninguém c

A vizinha do padeiro lhe pediu um pouco de massa. Vizinha de quem?

Do padeiro a

Do jornaleiro

Do papai

O bombeiro que salvou Joana agora é cabo. Quem?

Pedro

Seu filho

O bombeiro c

A filha do Aldir se encantou com a nova bolsa. Quem?

A filha do Aldir a

O porco

Aldir

O médico que tinha um barco nos ajudou na cheia. Tinha o quê?

Os brinquedos

Farofa

Um barco c

Ontem nós comemos arroz e ovo. Quando?

No ano passado

Ontem b

Sábado

Ruth se apresentou elegante como sua avó. Quem?

Uma tia

Ruth b

Edinéia

A prima do Luís o esperou naquele local. Esperou quem?

Luís a

Alberto

Um amigo

Os meninos que procuram seu tio estão na sala. Procuram quem?

A casa

Seu tio b

A avenida

O aluno da oficina se esforçou muito na serra. Quem da oficina?

O dono

O aluno b

Ninguém

Ele afirma que o peixe o surpreendeu fora d'água. Quem o surpreendeu?

A lancha

O anzol

O peixe c

O irmão da Zezé a convenceu com muito jeito. Convenceu quem?

Animais

Zezé b

O dono do bar

Ele entregou os documentos ao porteiro da noite. Entregou o quê?

Os documentos a

Um carro

Açúcar

Durante a seca, moradores do bairro se servem do poço. Quem?

Papai

Os moradores

b

O homem

Lista de 8 frases (marque 32 segundos)

O filho do caseiro se empanturrou de tanto comer mamão. Filho de quem?

Ninguém

Do caseiro b

Do padeiro

No sábado, o caçador de pássaros soltou a pomba. Quando?

Domingo

Sábado b

No parque

Ana decidiu não abrir aquela porta. Quem?

A roupa

O professor

Ana c

A moça trouxe a colher e levou o garfo. Quem?

A moça a

O homem

O ator

Mariana adora brincar com os amigos no pátio. Adora o que?

Correr

Brincar

Pular c

Marcela tirou a maquiagem do rosto. Quem?

A maquiagem

Marcela b

O cabelo

A sobrinha do palhaço o levou ao circo. Sobrinha de quem?

Do pássaro

Da tia

Do palhaço c

O médico explicou que se sujou com sangue. Quem?

O médico a

O técnico

A mamadeira

Fátima diz que seu marido a surpreende com um beijo. Quem surpreende?

Seu marido a

Leão

O lenço

O filho de Maria cortou-se com a faca. Filho de quem?

Maria a

Da fazendeira

Da professora

O político dedicou a vitória ao povo. Dedicou o que?

A casa

A planta

A vitória c

A dona do carro se enxugou quando subiu na balsa. Quem?

A coruja

A moça da padaria

A dona do carro c

O dançarino espera que sua parceira esteja no salão. Quem espera?

O gato

O menino

O dançarino c

Flávia gosta de maçã sem casca. Quem?

Joana

Flávia b

A mesa

A empregada limpou a casa e lavou a camisa de malha. Limpou o que?

A casa a

O envelope

O quarto

O menino trouxe muito leite e fubá. Quem?

O aluno

João

O menino c

No rio, a lavadeira lavou a blusa e a calça. Onde?

Na pia

No tanque

No rio c

O proprietário que vendeu a casa velha tem olhos verdes. Vendeu o que?

A casa velha a

O sítio

O perfume

O adversário do enxadrista o vencerá com o bispo. Adversário de quem?

Do piloto

Do coelho

Do enxadrista c

O cientista enxuga-se após fazer a barba. Quem?

Ele

A menina

O cientista c

Vinícius afirma que se alegrou com a bola de gude. Quem?

As horas

O filho

Vinícius c

Para pegar a bola, o jogador atirou-se no chão. Pegar o que?

O chapéu

O sapato

A bola c

Tiago pagou pelo tratamento do seu dente. Quem?

Tiago a

O pai

Eu

O homem que veio aqui comprou uma cabra. Quem?

O telefone

A pasta

O homem c

Lista de 9 frases (marque 36 segundos)

A mulher que cantou com a banda ganhou o prêmio. Cantou com quem?

A parede

A banda b

Os meninos

O cavalo que puxou a carroça veio direto do campo. Puxou o que?

A carroça a

O homem

O carro

Minha mãe foi vestir um xale. Quem?

Minha mãe a

Ela

A secretária

Durante a colheita, o patrão precisou do trator. Durante o que?

A colheita a

O dia

A semana

A avó de Ana lhe entregou um lenço. Avó de quem?

Mariana

Pedro

Ana c

De madrugada, Diego escondeu-se no seu quarto. Quando?

De madrugada a

Pela manhã

Na cama

Durante a corrida, o piloto consertou seu jipe. Fez o que?

Lavou

Consertou

b

Pintou

De dia, a moça não gosta de ficar no morro. Quando?

De dia

a

Durante a aula

No clube

Adriana não sabe que Paulinho brinca perto do fogão. Quem brinca?

A freira

Todos

Paulinho

c

O fiel confessou o pecado ao padre. Confessou o que?

O pecado a

O medo

O defeito

A estagiária de enfermagem esforçou-se naquele dia. Estagiária de que?

Enfermagem a

Pedagogia

Educação física

O pedreiro carregou o tijolo e a telha. Quem?

O pedreiro a

A mulher

A modelo

A professora Raquel decidiu ler o livro. Quem?

A moça

Raquel b

Dentista

No ônibus, João cedeu seu lugar ao seu avô. Onde?

No ônibus a

Na escola

No carro

O marinheiro sabe que se seguraria na corda. Quem?

O rato

O homem

O marinheiro

c

O cabeleireiro de minha tia comprou um pente. Cabelereiro de quem?

Mamãe

Do gato

Minha tia

c

O senador que mora em Brasília impediu o veto. Mora onde?

Curitiba

Belo Horizonte

Brasília

c

Clara mostrou sua carteira ao guarda. Quem?

Cachorro

Clara

b

Cecília

O marido de Joana a aguardava na fila. Marido de quem?

Maria

Joana b

Minha tia

Marcos deu um presente à sua namorada no lago. Deu o que?

Um presente a

Uma bala

Um prato

A aranha viu o pernilongo e a mosca. Quem viu?

O piano

O bicho

A aranha c

O motorista não obedeceu ao guarda. Não fez o que?

Obedeceu a

Bateu

Cortou

Ana acha que seu pai comprou uma moto. Quem comprou?

Seu pai a

O namorado

O tio

O marido de Andréa pagou o salário da babá. Pagou o que?

O salário a

O sapato

O almoço

O menino sente que se acostumou com o mangue. Quem?

A loja

O prédio

O menino

c

O aluno devolveu ao professor a colher. Devolveu a quem?

Ao Luís

Ao secretário

Ao professor

c

A tia acha que se perdeu no clube. Quem?

O papai

A raposa

A tia

c

Lista de 10 frases (**marque 40 segundos**)

Mês passado, o empresário comprou uma oficina e um banco. Quando?

Mês passado a

Segunda-feira

Depois da aula

Miguel quis aprender todas as línguas do mundo. Quem?

Miguel a

Túlio

O ladrão

O pedreiro se cansou e caiu no sono. Quem?

A vaca

O pedreiro b

O pescador

No zoológico, brincamos com o mico e vimos o pavão. Onde?

Na porta

Na floresta

No zoológico c

Na capela, o padre toca o órgão e o sino. Onde?

Na rua

No teatro

Na capela c

Gabriel ficou alegre e deu um pulo. Ficou como?

Dormindo

Triste

Alegre c

A água da banheira desceu pelo ralo. Água de onde?

Da banheira a

Do rio

Da televisão

O garçom pegou a jarra e serviu o caldo. Pegou o que?

O ônibus

A jarra a

O livro

A tia de Bruno lhe revelou o segredo da torta. Tia de quem?

Minha

Da moto

De Bruno c

O viajante precisava da passagem de volta. Quem?

O viajante a

O passageiro

Alguns

Joana pensa que não sabe a matéria da classe. Sabe o que?

A hora

A matéria b

O lugar

Durante a noite, João decidiu abaixar o som. Quando?

Na corrida

De dia

Durante a noite

c

No museu, a visitante disse que se apaixonou pelo guia. Onde?

No museu

a

Na praia

Na praça

Flávia mandou que seu primo a encontre na festa. Mandou quem?

Seu primo

a

O cachorro

O porteiro

Zeca que gosta de música, ganhou um disco. Gosta de que?

Açúcar

Música

b

Livro

O técnico do time buscou o jogador na quadra. Fez o que?

Correu

Levou

Buscou

c

O cachorro que perdeu o osso dormiu com fome. Perdeu o que?

A coleira

O osso

b

O ovo

A atriz que ganhou o prêmio tem uma pinta no queixo. Quem?

A atriz a

O amigo

A escola

Carla acredita que seu irmão gosta de manga. Quem acredita?

Minha colega

A menina

Carla c

No palco, Pedro finge-se de gago. Onde?

Em casa

No palco b

De noite

O mágico explicou que aquilo não era um sonho. Quem?

A bailarina

O mágico b

Os amigos

Sua chave deve estar dentro do seu bolso. O que?

A garrafa

O senador

Sua chave c

A criança sujou sua roupa toda de calda. Quem?

O tio

Carlinhos

A criança c

O lavador de janelas se viu refletido no vidro. Lavador de que?

De carro

De janelas b

De bolas

O dono do caminhão o encheu de carga. Dono de que?

Do canguru

Do caminhão b

Da lata

A lavadeira lavou as roupas e fechou a bica. Quem?

A lavadeira a

A namorada

A bota

Depois da natação, Eduardo disse que se sente bem. Quando?

À tarde

Durante a semana

Depois da natação c

O garoto diz que se feriu na testa. Quem?

O garoto a

O frango

O calção

A camisa de Raul estreitou-se muito na gola. De quem?

De Gustavo

De Raul b

A camisa

O mecânico trocou o pneu e a roda. Quem?

O mecânico a

A aluna

O cavalo

5- listas de palavras

Vou apresentar listas de palavras para vocês memorizarem. Depois que eu apresentar cada lista, quero que vocês escrevam as palavras da lista na mesma ordem em que eu falei. Usem uma linha para cada **palavra!** Atenção! Somente comecem a escrever ao final de cada lista.

listas de 3 palavras

FOTO	RATO	NOTA
JILÓ	DOCE	ÉGUA
COLA	BONÉ	PÁ

listas de 4 palavras

BOTE	GALO	MAÇO
JACA	RÉGUA	ANGÚ
MARÉ	DIA	REMO
REDE	CIPÓ	GIBI

listas de 5 palavras

JATO	MICO	RÃ
PÓ	ROLO	VERÃO
RIFA	SABÃO	ALHO
CHÃO	LIXO	SUCO
BALÉ	MOLA	DONA

listas de 6 palavras

TIA	TALCO	VINHO
OURO	VALA	MUSEU
BICO	BIFE	TUBO
FILÓ	OLHO	FOCA
ALÇA	JÓIA	SOLO
BURRO	MEL	VARA

listas de 7 palavras

COURO	TIRO	SACI
GALHO	LÃ	BALDE
PINO	RABO	EIXO
RAIO	MISSA	BÓIA
FACA	BALÃO	FERRO
GOTA	ANEL	ASA
VELHO	SETA	FUMO

listas de 8 palavras

POTE	DADO	PANO
LONA	CACAU	COXA
BARRO	LOBO	VÔO
SACO	MINA	CÊRA
LAÇO	CUBO	AÇO
AVE	SEIO	ERVA
MURO	LAGO	CANO
GOL	NÓ	BODE

listas de 9 palavras

RAMO	LATA	BOTA
PAPAI	BOCA	CALO
GEMA	VOVÔ	MAÇÃ
PIÃO	FERA	TOUCA
MORRO	MALA	FIO
COVA	SOFÁ	LEÃO
NATAL	COPO	RUBI
PEITO	MAGO	PÊLO
LOUÇA	TETO	NAVE

listas de 10 palavras

MAMÃE	VOVÓ	CAJÚ
SOJA	FITA	PELE
PISO	MULA	TACO
COPA	PICO	ÓLEO

LINHA	LIMA	COUVE
COCO	LOTE	DUQUE
RÁDIO	COLO	SOLA
BOI	VACA	BOTÃO
NEVE	PAJÉ	GELO
BIJÚ	LUPA	CANA

listas de 11 palavras

CORO	BARRA	CAPA
NABO	LIMÃO	SELA
TIO	PAU	TOCA
FADA	HERÓI	FILHA
BOXE	SEBO	LAMA
UNHA	TATU	PALCO
CONE	FIGO	SOL
PERU	SELO	FAVA
LIMÃO	LAMA	TEIA
CEGO	VASO	UVA
MEIA	LUVA	CALÇA

6- Compreensão de Frases

Agora nós vamos responder perguntas sobre frases. Na próxima página do caderno vocês encontrarão todas as frases. Atenção! Para responder às perguntas, quero que vocês façam um “X” na resposta que acharem correta. Trabalhem o mais rápido que puderem e respondam ao maior número possível de frases. Quando eu disser para virarem a folha, vocês podem começar a fazer a tarefa e, quando eu disser que o tempo acabou, vocês não deverão resolver mais nenhum problema.

Você deverá marcar um prazo de 20 segundos para cada folha

7- Reconhecimento de Letras e de Desenhos

Nos cadernos que vocês receberam há impressas em todas as páginas muitas seqüências de letras ou seqüências de desenhos. As seqüências estão organizadas em pares, uma ao lado da outra. Ao lado de cada par de seqüências há um espaço sublinhado correspondente. Muitos dos pares de seqüências são exatamente iguais e muitos outros pares são um pouco diferentes. A tarefa de vocês é a seguinte: Vocês terão que decidir se cada par de seqüências é igual ou não. Coloquem nos espaços um “i” quando as seqüências forem iguais e um “d” quando forem diferentes. Vocês

terão um tempo muito curto para trabalhar, portanto, não percam tempo em verificar suas respostas e respondam o mais rápido possível.

Você deverá marcar um prazo de 30 segundos para cada coluna

Appendix – D - List of words for the vocabulary test

Stimuli	Concreteness	Cognate status	Ambiguity in English	Translation ambiguity	Celex	Length
ashamed	abstract	noncog	unamb	no	21,79	7
border	abstract	noncog	unamb	no	36,03	6
butter	concrete	noncog	unamb	no	27,37	6
chew	concrete	noncog	unamb	no	5,36	4
chicken	concrete	noncog	unamb	no	30,45	7
clothing	concrete	noncog	unamb	no	35,03	8
co-worker	abstract	noncog	unamb	no	0	8
crazy	abstract	noncog	unamb	no	30,84	5
desire	abstract	noncog	unamb	no	63,13	6
disease	abstract	noncog	unamb	no	63,35	7
dog	concrete	noncog	unamb	no	71,73	3
duty	abstract	noncog	unamb	no	65,25	4
easy	abstract	noncog	unamb	no	150,06	4
eyeglasses	concrete	noncog	unamb	no	0,61	10
flag	concrete	noncog	unamb	no	19,89	4
frame	concrete	noncog	unamb	no	26,82	5
friend	abstract	noncog	unamb	no	172,46	6
haircut	concrete	noncog	unamb	no	2,18	7
laugh	abstract	noncog	unamb	no	56,93	5
lightning	concrete	noncog	unamb	no	14,13	9
money	concrete	noncog	unamb	no	403,69	5
murder	abstract	noncog	unamb	no	50,5	6
nest	concrete	noncog	unamb	no	13,74	4
opening	concrete	noncog	unamb	no	61,68	7
pants	concrete	noncog	unamb	no	15,75	5
path	abstract	noncog	unamb	no	50,84	4
picture	concrete	noncog	unamb	no	106,42	7
research	abstract	noncog	unamb	no	120,73	8
sadness	abstract	noncog	unamb	no	8,6	7
screen	concrete	noncog	unamb	no	28,77	6
ship	concrete	noncog	unamb	no	45,25	4
smell	abstract	noncog	unamb	no	60,5	5
suitcases	concrete	noncog	unamb	no	6,37	9
summer	abstract	noncog	unamb	no	120,95	6
to change	abstract	noncog	unamb	no	0	8
to fall	concrete	noncog	unamb	no	0	6
trade	abstract	noncog	unamb	no	165,75	5
whole	abstract	noncog	unamb	no	421,56	5

Appendix E - Instructions for Vocabulary Test

Nesta tarefa você verá algumas palavras em inglês, apresentadas no centro da tela do computador, uma de cada vez. Após cada palavra, você deverá traduzir em voz alta a palavra para o português. Por exemplo, se você vir a palavra “*give*” você poderá dizer “dar”.

Diga a tradução da palavra o mais rápida e corretamente possível. Se você não disser uma palavra dentro de 4 segundos, a palavra desaparecerá da tela. Se você não se lembrar da palavra em português, simplesmente diga “não”.

Jamais diga “ummm” ou faça qualquer outro som antes de dizer a palavra, pois isso atrapalhará a gravação das suas palavras.

Depois que você traduzir a palavra, você verá uma tela em que aparecerá a pergunta “você consegue pensar em mais alguma tradução?” Essa é a oportunidade de você dizer quaisquer outras palavras que conseguir pensar. Quando você estiver pronto, e não souber outras traduções, simplesmente aperte a tecla de espaço no teclado.

Se tiver qualquer dúvida pergunte agora.

Quando estiver pronto para iniciar, pressione a tecla de espaço.

Appendix F - Students' Answers in the Vocabulary Test

Subject 1

estimulo	traducao	Acc
ashamed	envergonhado	1
border	borda	1
co-worker	colega de trabalho	1
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	trabalho	1
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	aroma	1
summer	verão	1
to change	mudar	1
trade	comércio	1
whole	inteiro	1
Média		1
butter	manteiga	1
chew	mastigar	1
chicken	galinha	1
clothing	vestimentas	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	trovão	1
money	dinheiro	1
nest	ninho	1
opening	abertura	1
pants	calças	1
picture	figura	1
screen	tela	1
ship	navio	1
suitcases	malas	1
to fall	cair	1
Média		0,947368

Subject 2

estimulo	traducao	Acc
ashamed	não	0
border	borda	1
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	matar	1
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	não	0
whole	durar	0
Média		0,6316
butter	não	0
chew	não	0
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	oculos	1
flag	não	0
frame	não	0
haircut	corte de cabelo	1
lightning	luminoso	0
money	dinheiro	1
nest	cesta	0
opening	abrir	0
pants	luvas	0
picture	figura	1
screen	não	0
ship	navio	1
suitcases	não	0
to fall	cair	1
Média		0,4737

Subject 3

Ashamed	não	0
border	margem	1
co-worker	não	0
crazy	louco/maluco	1
desire	desejar/ansiar	1
disease	doença/enfermidade	1
duty	não	0
easy	fácil/simples	1
friend	amigo/colega	1
laugh	rindo/risada/rir	1
murder	assassino	1
path	não	0
research	pesquisar/buscar	1
sadness	tristeza/infelicidade	1
smell	cheiro/odor	1
summer	verão	1
to change	mudar	1
trade	negócio/comércio	1
whole	não	0
Média		0,736842

butter	manteiga/margarina	1
chew	não	0
chicken	frango	1
clothing	não	0
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	moldura\retrato	1
haircut	corte de cabelo	1
lightning	brilhando	0
money	dinheiro	1
nest	não	0
opening	abrindo	1
pants	calça/roupa interior	1
picture	pintura	1
screen	não	0
ship	navio/barco	1
suitcases	pasta	0
to fall	cair	1
Média		0,684211

Subject 4

ashamed	vergonha	0
border	borda	1
co-worker	colega	1
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	dever	1
easy	fácil	1
friend	amigo	1
laugh	risada	1
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	não	0
whole	não	0
Média		0,777778
butter	manteiga	1
chew	não	0
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	não	0
lightning	não	0
money	dinheiro	1
murder	assassino	1
nest	ninho	1
opening	aberto	0
pants	calça	1
picture	figura	1
screen	tela	1
ship	navio	1
suitcases	não	0
to fall	não	0
Média		0,65

Subject 5

ashamed	não	0
border	fronteira	1
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	não	0
duty	sujo	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assaltante	0
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	doce	0
summer	verão	1
to change	mudar	1
trade	não	0
whole	não	0
Média		0,526316
butter	não	0
chew	não	0
chicken	galinha	1
clothing	vestindo	0
dog	cachorro	1
eyeglasses	não	0
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	não	0
money	dinheiro	1
nest	próximo	0
opening	abrindo	1
pants	calça	1
picture	figura	1
screen	tela	1
ship	navio	1
suitcases	não	0
to fall	não	0
Média		0,526316

Subject 6

ashamed	não	0
border	fronteira	1
co-worker	não	0
crazy	loucura	1
desire	não	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	rir	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	trocar	1
whole	inteiro	1
Média		0,842105
butter	manteiga	1
chew	bochecha	0
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	0
frame	não	1
haircut	corte de cabelo	1
lightning	iluminar	1
money	dinheiro	1
nest	ninho	1
opening	abertura	1
pants	calça	0
picture	figura/imagem	1
screen	tela	1
ship	barco/navio	1
suitcases	malas	1
to fall	não	0
Média		0,789474

Subject 7

ashamed	não	0
border	não	0
co-worker	trabalhar em equipe	0
crazy	louco	1
desire	desejo	1
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassino	0
path	camada	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	trocar	1
trade	trocar	1
whole	inteiro	1
Média		0,631579
butter	margarina	0
chew	não	0
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	Tela	0
haircut	corte de cabelo	1
lightning	iluminação	0
money	dinheiro	1
nest	não	0
opening	abrir	0
pants	não	0
picture	figura	1
screen	não	0
ship	navio	1
suitcases	pasta	0
to fall	cair	1
Média		0,526316

Subject 8

ashamed	medo	0
border	não	0
co-worker	Co-trabalhador	0
crazy	louco	1
desire	não	0
disease	não	0
duty	sujo	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassino	0
path	não	0
research	pesquisa	1
sadness	triste	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	negócio	1
whole	inteiro	1
Média		0,578947
butter	não	0
chew	não	0
chicken	galinha	1
clothing	vestuário	1
dog	cachorro	1
eyeglasses	óculos de sol	0
flag	não	0
frame	quadro	0
haircut	cabelo curto	0
lightning	iluminado	0
money	dinheiro	1
nest	não	0
opening	aberto	0
pants	calça	1
picture	quadro	1
screen	tela	1
ship	não	0
suitcases	não	0
to fall	cair	1
Média		0,421053

Subject 9

ashamed	envergonhado	1
border	borda	1
co-worker	colega	1
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	ocupado	0
easy	fácil	1
friend	amigo	1
laugh	rir	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	negociar	1
whole	inteiro	1
Média		0,944444
butter	manteiga	1
chew	mascar/mastigar	1
chicken	galinha	1
clothing	roupas	1
dog	cachorro/cão	1
eyeglasses	óculos	1
flag	bandeira	1
frame	quadro	0
haircut	corte de cabelo	1
lightning	iluminado	0
money	dinheiro	1
nest	ninho	1
opening	abrir	0
pants	calça	1
picture	foto	1
screen	tela	1
ship	chegada	0
suitcases	mala	1
to fall	cair	1
Média		0,789474

Subject 10

ashamed	não	0
border	não	0
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassino	0
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	não	0
whole	todo	1
Média		0,631579
butter	não	0
chew	não	0
chicken	galinha	1
clothing	vestindo	0
dog	cachorro	1
eyeglasses	não	0
flag	não	0
frame	não	0
haircut	corte de cabelo	1
lightning	luz	0
money	dinheiro	1
nest	não	0
opening	abrindo	1
pants	calças	1
picture	pintura	1
screen	tela	1
ship	navio	1
suitcases	não	0
to fall	cair	1
Média		0,526316

Subject 11

ashamed	envergonhado	1
border	não	0
co-worker	colega de trabalho	1
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudança	1
trade	não	0
whole	inteiro	1
Média		0,789473684
butter	manteiga	1
chew	mastigar	1
chicken	frango	1
clothing	roupas	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	trovão	1
money	dinheiro	1
nest	ninho	1
opening	abertura	1
pants	calças	1
picture	foto	1
screen	tela	1
ship	navio	1
suitcases	não	0
to fall	cair	1
Média		0,894736842

Subject 12

ashamed	envergonhado	1
border	canto	0
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	dever	1
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheirar	1
summer	verão	1
to change	trocar	1
trade	troca	1
whole	todo	1
Média		0,894737
butter	manteiga	1
chew	mastigar/mascar	1
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	eletricidade	0
money	dinheiro	1
nest	ninho	1
opening	abertura	1
pants	calças	1
picture	figura	1
screen	tela	1
ship	navio	1
suitcases	mala	1
to fall	cair	1
Média		0,894737

Subject 13

Stimuli	Tradução	ACC
ashamed	envergonhado	1
border	não	0
co-worker	não	0
crazy	louco	1
desire	não	0
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	rir	1
murder	assassinato	1
path	não	0
research	pesquisar	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	não	0
whole	inteiro	1
Média		0,6842
butter	manteiga	1
chew	não	1
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	não	0
flag	bandeira	1
frame	linha	0
haircut	corte de cabelo	1
lightning	iluminar	0
money	dinheiro	1
nest	não	0
opening	abrir	0
pants	calças	1
picture	fotografia	1
screen	não	0
ship	navio	1
suitcases	não	0
to fall	cair	1
Média		0,6316

Subject 14

ashamed	envergonhado	1
border	borda/limite	1
co-worker	ajudante	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	dever	1
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	céu/pássaro	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	troca/negociação	1
whole	completo	1
Média		0,894736842
butter	manteiga	1
chew	mascar	1
chicken	galinha	1
clothing	roupas	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	raio/luz	1
money	dinheiro	1
nest	ninho	1
opening	abrindo/abertura	1
pants	calças	1
picture	imagem/retrato	1
screen	não	0
ship	navio/barco	1
suitcases	estojo	0
to fall	cair	1
Média		0,842105263

Subject 15

ashamed	envergonhado	1
border	quadro	0
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	tendencia	0
whole	inteiro	1
Média		0,736842
butter	manteiga	1
chew	não	0
chicken	galinha	1
clothing	não	0
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	moldura	1
haircut	corte de cabelo	1
lightning	iluminação	0
money	dinheiro	1
nest	não	0
opening	abrir	0
pants	calças	1
picture	Foto	1
screen	gritar	0
ship	não	0
suitcases	estojo	0
to fall	cair	1
Média		0,578947

Subject 16

ashamed	envergonhado	1
border	não	0
co-worker	colega de trabalho	1
crazy	louco	1
desire	desejar	1
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	gargalhada	1
murder	assassinato	1
path	não	0
research	trabalho	0
sadness	não	0
smell	cheirar	1
summer	verão	1
to change	mudar	1
trade	não	0
whole	inteiro	1
Média		0,631579
butter	não	0
chew	não	0
chicken	galinha	1
clothing	vestuário	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	relampago	1
money	dinheiro	1
nest	não	0
opening	abertura	1
pants	calças	1
picture	pintura	1
screen	não	0
ship	navio	1
suitcases	não	0
to fall	cair	1
Média		0,684211

Subject 17

ashamed	envergonhado	1
border	borda	1
co-worker	parceiro	0
crazy	loucura	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassino	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	troca	1
whole	inteiro	1
Média		0,8947
butter	manteiga	1
chew	mastigar	1
chicken	frango	1
clothing	vestir	0
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	quadro	0
haircut	corte de cabelo	1
lightning	raio	1
money	dinheiro	1
nest	não	0
opening	abertura	1
pants	calças	1
picture	foto	1
screen	tela	1
ship	navio	1
suitcases	mala	1
to fall	cair	1
Média		0,8421

Subject 18

ashamed	não	0
border	não	0
co-worker	não	0
crazy	louco	1
desire	não	0
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	não	0
murder	não	0
path	não	0
research	pesquisar	1
sadness	não	0
smell	não	0
summer	verão	1
to change	mudar	1
trade	não	0
whole	não	0
Média		0,315789
butter	manteiga	1
chew	não	0
chicken	galinha	1
clothing	vestir	0
dog	cachorro	1
eyeglasses	não	0
flag	não	0
frame	não	0
haircut	corte de cabelo	1
lightning	não	0
money	dinheiro	1
nest	não	0
opening	abrir	0
pants	calça	1
picture	foto/figura	1
screen	grito	0
ship	navio	1
suitcases	não	0
to fall	não	0
Média		0,4210526

Subject 20

ashamed	envergonhado	1
border	fronteira	1
co-worker	companheiro	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	para mudar	1
trade	troca	1
whole	todo	1
Média		0,8947
butter	manteiga	1
chew	não	0
chicken	galinha	1
clothing	roupas	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	luz	0
money	dinheiro	1
nest	dormir	0
opening	abertura	1
pants	calças	1
picture	desenho	1
screen	tela	1
ship	navio	1
suitcases	mala	1
to fall	para cair	1
Média		0,7895

Subject 21

ashamed	não	0
border	não	0
co-worker	não	0
crazy	louco	1
desire	não	0
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	alto	0
murder	assassino	0
path	não	0
research	pesquisa	1
sadness	não	0
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	não	0
whole	não	0
Média		0,3684
butter	não	0
chew	não	0
chicken	galinha	1
clothing	não	0
dog	cão	1
eyeglasses	óculos	1
flag	não	0
frame	não	0
haircut	cabelo bonito	0
lightning	não	0
money	dinheiro	1
nest	não	0
opening	abrindo	1
pants	calça	1
picture	figura	1
screen	gritar	0
ship	não	0
suitcases	não	0
to fall	cair	1
Média		0,4211

Subject 22

ashamed	envergonhado	1
border	não	0
co-worker	companheiro de trabalho	1
crazy	maluco	1
desire	desejo	1
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	troca	1
whole	inteiro	1
Média		0,842105
butter	não	0
chew	não	0
chicken	galinha	1
clothing	vestimenta	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	iluminando	0
money	dinheiro	1
nest	não	0
opening	abrindo	1
pants	não	0
picture	Figura	1
screen	tela	1
ship	barco	1
suitcases	não	0
to fall	cair	1
Média		0,631579

Subject 23

ashamed	envergonhado	1
border	não	0
co-worker	não	1
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	dever	1
easy	fácil	1
friend	amigo	1
laugh	não	0
murder	assassinato	1
path	caminho	1
research	busca	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	trocar	1
trade	negócio	1
whole	inteiro	1
Média		0,894737
butter	manteiga	1
chew	não	0
chicken	galinha	1
clothing	vestuário	1
dog	cachorro	1
eyeglasses	óculos de sol	0
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	não	0
money	dinheiro	1
nest	não	0
opening	abertura	1
pants	calça	1
picture	figura	1
screen	tela	1
ship	navio	1
suitcases	mala de objetos	1
to fall	cair	1
Média		0,736842

Subject 24

ashamed	vergonha	0
border	borda	1
co-worker	co-trabalhador	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	rir	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	viagem	0
whole	completo	1
Média		0,789474
butter	manteiga	1
chew	não	0
chicken	galinha	1
clothing	vestindo	0
dog	cão	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	relampago	1
money	dinheiro	1
nest	não	0
opening	abrindo	1
pants	calças	1
picture	foto	1
screen	tela	1
ship	ovelha	0
suitcases	calças	0
to fall	cair	1
Média		0,684211

Subject 26

ashamed	vergonha	0
border	borda	1
co-worker	trabalhador	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	doença	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	tratado	0
whole	inteiro	1
Média		0,736842
butter	manteiga	1
chew	fofoca	0
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	iluminado	0
money	dinheiro	1
nest	não	0
opening	aberto	0
pants	calça	1
picture	figura	1
screen	tela	1
ship	barco	0
suitcases	mala	1
to fall	cair	1
Média		0,684211

Subject 27

ashamed	não	0
border	borda	1
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	não	0
duty	não	0
easy	fácil	1
friend	amigo	1
laugh	riso	1
murder	não	0
path	não	0
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	marca	0
whole	não	0
Média		0,578947
butter	não	0
chew	não	0
chicken	frango	1
clothing	roupa	1
dog	cão	1
eyeglasses	óculos	1
flag	bandeira	1
frame	porta retrato	1
haircut	corte de cabelo	1
lightning	brilhante	0
money	dinheiro	1
nest	não	0
opening	abrindo	1
pants	calça	1
picture	imagem	1
screen	tela	1
ship	não	0
suitcases	malas	1
to fall	cair	1
Média		0,736842

Subject 29

ashamed	envergonhado	1
border	não	0
co-worker	cooperador	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	dever	1
easy	fácil	1
friend	amigo	1
laugh	rir	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	troca	1
whole	inteiro	1
Média		0,894737
butter	manteiga	1
chew	mastigar	1
chicken	galinha	1
clothing	roupa	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	raio	1
money	dinheiro	1
nest	ninho	1
opening	abertura	1
pants	calças	1
picture	foto	1
screen	tela	1
ship	barco	0
suitcases	não	0
to fall	cair	1
Média		0,842105

Subject 29

ashamed	envergonhado	1
border	costa	0
co-worker	não	0
crazy	louco	1
desire	desejo	1
disease	doença	1
duty	culpa/culpado	0
easy	fácil	1
friend	amigo	1
laugh	risada	1
murder	assassinato	1
path	caminho	1
research	pesquisa	1
sadness	tristeza	1
smell	cheiro	1
summer	verão	1
to change	mudar	1
trade	trato	0
whole	todo	1
Média		0,789474
butter	manteiga	1
chew	mascar	1
chicken	galinha	1
clothing	roupas	1
dog	cachorro	1
eyeglasses	óculos	1
flag	bandeira	1
frame	não	0
haircut	corte de cabelo	1
lightning	luz	0
money	dinheiro	1
nest	ninho	1
opening	abrir	0
pants	calças	1
picture	figura	1
screen	tela	1
ship	nave	0
suitcases	malas	1
to fall	cair	1
Média		0,789474