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PÓS-GRADUAÇÃO EM LETRAS/INGLÊS E LITERATURA CORRESPONDENTE

INVESTIGATING THE EFFECTS OF MODIFIED INPUT AND PUSHED

OUTPUT ON THE COMPREHENSION AND ACQUISITION OF L2

VOCABULARY

por

Angélica Del Valle

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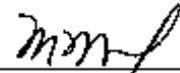dos requisitos para obtenção do grau de

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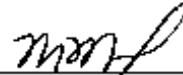
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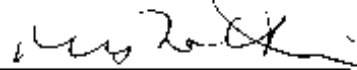Mailce Borges Mota Fortkamp
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To Consuelo

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ABSTRACT

INVESTIGATING THE EFFECTS OF MODIFIED INPUT AND PUSHED OUTPUT ON THE COMPREHENSION AND ACQUISITION OF L2 VOCABULARY

ANGÉLICA DEL VALLE

UNIVERSIDADE FEDERAL DE SANTA CATARINA

2004

Supervising Professor: Mailce Borges Mota Fortkamp, PhD

This study investigated the effects of three linguistic conditions – premodified input, interactionally modified input, and pushed output – on the comprehension and acquisition of ten L2 lexical items. Thirty Brazilian intermediate-level EFL learners from the Extra-curricular program at the Federal University of Santa Catarina (UFSC) participated in the study. The task used in the treatment consisted of carrying out ten directions in which the target lexical items were embedded (contextualized). This task was further divided into two ten-minute sessions. The modified input groups repeated the same task with slight changes in both sessions but the output group gave ten directions to the instructor in the second ten-minute session. Immediately after the task, two recall tests – receptive and productive – were administered. A week after the immediate tests, two delayed recall tests – receptive and productive – were given. The data obtained were then analyzed quantitatively, that is, only learning outcomes were taken into account. Results

indicate that the three linguistic environments yielded reasonable comprehension scores; however, none of the three linguistic conditions led to significant acquisition scores. It must be pointed out, nevertheless, that between receptive and productive scores, there was a trend for receptive scores to be slightly higher.

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RESUMO

INVESTIGATING THE EFFECTS OF MODIFIED INPUT AND PUSHED OUTPUT ON THE COMPREHENSION AND ACQUISITION OF L2 VOCABULARY

ANGÉLICA DEL VALLE

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2004

Professora supervisora: Mailce Borges Mota Fortkamp, PhD

Este estudo investiga os efeitos de três contextos linguísticos – insumo pré-modificado (*premodified input)*, insumo modificado durante a interação (*interactionally modified input)*, e produção estimulada (*pushed output*) – na compreensão e aquisição de vocabulário da língua inglesa. Trinta alunos brasileiros do programa extra-curricular da UFSC, com nível intermediário na língua inglesa, participaram deste estudo. A atividade aplicada durante o experimento consistiu em executar dez instruções nas quais as palavras investigadas estão inseridas, isto é, contextualizadas. Essa atividade foi dividida em duas sessões de dez minutos. Os dois grupos de insumo completaram a mesma atividade durante as duas sessões, enquanto o grupo de produção inverteu os papeis com a instrutora, isto é, durante a segunda sessão, os alunos deram as instruções à instrutora. Imediatamente após a atividade, dois testes de aquisição – um receptivo e outro produtivo – foram administrados. Uma semana depois destes testes, dois testes de aquisição – um receptivo e outro produtivo

– foram novamente administrados. Os dados obtidos foram analisados quantitativamente em relação ao número de palavras aprendidas. Os resultados indicam que os três contextos linguísticos são razoavalmente benéficos à comprensão. No entanto, nenhum dos contextos resultou em aquisição significativa. Os resultados mostram que, apesar da aquisição das palavras novas ter sido pouco significativa, houve uma tendencia a favorecer a retenção de palavras de maneira receptiva.

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CHAPTER 1

INTRODUCTION

1.1. Preliminaries

Researchers seem to agree on the primacy of vocabulary in L1 (Beck & McKeown, 1991; Nagy, 1997; Nagy & Herman, 1987; Drum & Konopak, 1987; Sternberg, 1987) and L2[1] learning [2](Coady, 1997; Nation, 1982, 2001; Meara, 1980, among others). In L1, for example, vocabulary knowledge is believed to play a major role in understanding texts (Beck & McKeown, 1991). In L2, the findings of several studies (Swain & Lapkin, 1995; Meara, 1980; Nation, 1982; Mackey, Gass, & McDonough, 2000, among many others) reveal that L2 learners face major difficulties with lexis. Although these examples point to the importance of vocabulary, the state of affairs with regard to the L2 lexicon is that investigators disagree on what is the best approach to teach or learn this aspect of the L2. A clear example of what divides researchers concerns the type of learning – *incidental* or *intentional* – they consider as being more conducive to vocabulary learning (Beck & McKeown, 1991**;** Nagy, 1997). This particular issue will be taken up again in section 1.3 of this chapter and later in Chapter 2, the review of the literature.

Another area, although not directly related to vocabulary, that divides researchers concerns SLA theories. The 1980s, for example, saw *input* and *output* become topics of interest (Krashen, 1982; Long, 1983; Swain, 1985). Although studies on input had been

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[1] In the present study, L2 will embrace both second and foreign language. A distinction will be made as to whether the context is that of a second or foreign language only when it is deemed necessary.
[2] Although the terms *acquisition* and *learning* are controversial (Krashen ,1982; McLaughlin, 1987), they will be used interchangeably in this study, that is, both terms will refer to the retention of knowledge.

conducted in the 1970s (e.g., Wagner-Gough & Hatch, 1975), input quickly became controversial when its advocates presented it to the linguistic arena as the *only* causable variable responsible for driving the acquisition process (Krashen, 1982; Long, 1983). The input-based theories saw the role for output as secondary, that is, its only function was to practice forms that had already been acquired (Krashen, 1982; Gass & Varonis, 1994). Output, in fact, did not break ground until the mid 1980s, when Swain (1985) first suggested that this variable played important functions in the acquisition process. Briefly put, input-based theories (Krashen, 1982; Long, 1983) claim that input that is comprehensible to the learner is the necessary condition to trigger acquisition, whereas output-based theories (Swain, 1985) claim that "producing the target language may be the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her intended meaning" (p. 249). Research to date, however, has not offered conclusive findings as to which variable – comprehension or production – is the driving force of L2 acquisition. To deal with this issue, researchers have investigated the learning conditions that are most favorable to acquisition. By manipulating the two variables – *input* and *output* – under different conditions – *premodified input*, *interactionally modified input*, and *pushed output* – researchers have suggested that 1) interactionally modified input promotes better comprehension than premodified input, but the same cannot be said for subsequent word recognition (Loschky, 1994; R. Ellis, 1994; Ellis, Tanaka, & Yamazaki, 1994); 2) pushed output promotes better comprehension and subsequent word recognition and production than modified input, both premodified and interactionally modified; however, one type of input is not superior to the other (Ellis & He, 1999); and, 3) pushed output and interactionally modified input promote better comprehension than premodified input, but in terms of subsequent word recognition and

production the scenario is not clear-cut (de la Fuente, 2002). As stated previously, this area of research warrants further scrutiny, as the findings are still inconclusive.

The state of affairs in L2 with regard to vocabulary learning is not any different from the L1; that is, L2 researchers are also motivated to investigate how L2 learners acquire lexis. Many of these researchers have greatly been influenced by the research conducted in L1 such as semantic processing and mnemonic techniques (Cohen, 1987; Brown & Perry, 1991; Donato, 1999, among many others). However, few investigators have approached vocabulary learning with clear L2 acquisition theories (Loschky, 1994; Ellis & He, 1999; de la Fuente, 2002) as a basis. As already mentioned, there is a need to investigate which variable – comprehension or production – is more favorable to the acquisition of L2 vocabulary. Thus, by manipulating the variables of input and output, the present study aims at investigating the effects of three linguistic conditions – premodified input, interactionally modified input, and pushed output – on L2 vocabulary acquisition. The next section will provide a brief overview of what has been investigated in L2 vocabulary research and will be followed by a section on learning sources and linguistic conditions.

1.2. Brief overview of L2 vocabulary research

Although L2 vocabulary research has gained impetus in the last two decades (Meara, 1980, Maiguashca, 1993; Laufer, 1997, among many others), it remained an overlooked aspect between the 1960s and 1980s (Maiguashca, 1993). It was not uncommon for scholars who were discontent with the situation to describe vocabulary as "the neglected aspect" and "the poor relation of language learning" (Maiguascha, 1993, p. 84). Teaching vocabulary was considered unnecessary, as it would take care of itself

(Maiguashca, 1993, p. 84). Maiguashca offers two probable reasons why vocabulary remained overlooked: (1) semantics entered the linguistic scene much later than grammar and phonology (p. 85); and, (2) vocabulary does not possess the systematicity found in grammar and phonology; in other words, vocabulary does not lend itself to be taught as neatly as grammar because it does not consist of a set of rules (p. 85).

Despite this hiatus in the broad area of L2 vocabulary acquisition, two aspects were investigated in more depth: frequency counts and mnemonic techniques. As regards the former, the 1950s witnessed a great interest in determining vocabulary size. Paramount to this trend was West's *General Service List* (1953) which helped determine what words were of high and low frequency. According to Meara (1980), frequency counts were spurred, not by a theoretical motivation, but by an interest in language teaching, in order to decide which words to include in language materials.

Investigation into mnemonic techniques emerged in the 1970s. These techniques, which are explicit strategies to learn vocabulary, challenged the assumption of frequency counts that massive amounts of vocabulary could be learned (Meara, 1980, p. 224). The most studied technique has been the key word method (Meara, 1980, p. 225). According to Meara, "[i]n this method, the target-language words are associated with phonetically similar English words (called key words) in the first stage of learning, and then, in the second stage, these key words are associated with the English translation of the original target-language word by means of a striking visual image" (p. 225). The criticism put forth by Meara is that these two areas of research – frequency counts and mnemonic techniques – have dealt with peripheral, rather than central aspects of vocabulary, namely the management of the learning process (p. 227).

The current situation has changed, though. L2 vocabulary research has broadened its scope: more is now known about the psycholinguistic factors that affect L2 vocabulary learning (Ellis & Beaton, 1993a; Laufer, 1997), assessment of vocabulary knowledge (Wesche & Paribakht, 1996; Read, 1997), receptive and productive vocabulary (Teichroew, 1982), among other vocabulary-related issues. In short, vocabulary research has made tremendous progress since the 1980s and it is no longer regarded as the "poor relation of language teaching" (Maiguashca, 1993, p. 85; Laufer, 1997).

1.3. Learning sources and linguistic conditions

As already mentioned, there are two sources of vocabulary learning: incidental and intentional learning (Beck & McKeown, 1991, p. 798). On the one hand, incidental learning is defined as the type of learning that is a by-product of doing or learning something else (Hatch & Brown, 1995, p. 368). In other words, the major purpose in an incidental vocabulary-learning situation is not to learn words (Beck & McKeown, p. 789). This type of learning has been investigated mainly from written contexts in L1 (Drum & Konopack, 1987; Graves, 1987) and in L2 (Dupuy & Krashen, 1993; Huckin & Bloch, 1993; cited in Hatch & Brown, 1987). Intentional learning, on the other hand, is defined as being designed, planned for, or intended by teacher or student (Hatch & Brown, 1995, p. 368). That is to say, in intentional learning the explicit purpose of an undertaking is to learn the meaning and form of a word (Beck & McKeown, p. 798). One can learn intentionally by consulting a dictionary or by receiving direct instruction on the meaning of words. Although there is a need to study both types of learning sources, the present study will focus on incidental L2 vocabulary learning from oral language, as there is a gap in research concerning this matter (R. Ellis, 1994).

In the present study, the claims of two input-based theories - the Input Hypothesis (Krashen, 1982) and the Interaction Hypothesis (Long, 1983) – and one output-based theory – the Output Hypothesis (Swain, 1985) – with regard to the acquisition of L2 lexical items will be investigated by means of three linguistic conditions: 1) premodified input, 2) interactionally modified input, and 3) pushed output. Premodified input refers to input that has been simplified by making it more redundant and less grammatically complex (Ellis & He, 1999, p. 297). Redundant and less grammatically complex language is claimed to make the language more comprehensible to the learner (Krashen, 1982). Interactionally modified input refers to input that has been modified as a result of meaning negotiation; that is, learners are provided with unmodified language and through interaction they would signal to their interlocutors a need for language modification (Long, 1983). Although input is seen as the external variable responsible for the acquisition process, interaction via meaning of negotiation is seen as the catalyst to obtain comprehensible language (Long, 1983). Finally, pushed output refers to output that is precise, coherent, and appropriate (Swain, 1985, 1995). That is, learners must be pushed to "analyze the grammar of the target language because their current output appears to succeed in conveying their intended message" (Swain, 1985, p. 249).

1.4. The Study

The objective of the present study is to investigate the effects of three linguistic conditions – premodified input, interactionally modified input, and pushed output – on the comprehension[3] and acquisition[4] of L2 lexical items. The tasks that were used to elicit the

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[3] In the present study, *comprehension* is operationalized as the understanding of ten directions containing new words and it was assessed by how well the participants carried out the ten instructions when placing the

data were reciprocal and non-reciprocal tasks. Because reciprocal tasks require "a two-way flow of information between a speaker and a listener", (Ellis, 2001, p. 49) it was deemed suitable to investigate the claims of the interaction hypothesis (Long, 1983), which posits that comprehensible input is the causable variable in the SLA process when accessed via interaction, and the output hypothesis (Swain, 1985), which posits that "producing the target language may be the trigger that forces the learner to pay attention to the means of expression needed in order to successfully convey his or her own intended meaning" (Swain, 1985, p. 249). In other words, some interaction[5] between the participants is necessary to investigate these hypotheses. A non-reciprocal task, on the other hand, requires "a one-way flow of information from a speaker to a listener" (Ellis, 2001, p. 49). As the task does not require the listener to engage in output, it was deemed appropriate to investigate the claims of the input hypothesis (Krashen, 1982), which claims that comprehensible input is the only causable variable in the acquisition process.

In the present study, learners were required to complete the tasks by listening or by interacting. In both instances, I will argue that the tasks called for incidental learning for the following reason: as will be seen in Chapter 3 (section 3.4), the tasks, whose primary goal consisted in carrying out ten directions containing the ten new words participants were to learn, were composed of two secondary, but no less important goals. First, participants had to choose the target item – the new word – from among fifteen pictures representing kitchen objects – ten target items and five distractors; and secondly, they had to locate the

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number pertaining to the small pictures on the matrix diagram during the first ten-minute session (Ellis & He, 1999; de la Fuente, 2002).

[4] In the present study, *acquisition* was assessed by means of two recognition and production recall posttests (de la Fuente, 2002).

[5] On the one hand, Long (1983) sees interaction as an important part in the SLA process because comprehensible input is obtained when communication breakdowns emerge. On the other hand, Swain (1995) see interaction as essential because through production, learners may engage in syntactic analysis of the language which she claims is important to the SLA process (Swain, 1985, p. 249).

place in the kitchen where the numbered-object had to be placed. In other words, the learning from this task is best described as incidental because the learning of the target items was a by-product of doing something else, namely carrying out the ten directions (Hatch & Brown, 1985).

The questions that motivated the present study are based on Ellis and He (1999), who investigated the effect of three linguistic conditions – premodified input, interactionally modified input, and pushed output – on vocabulary acquisition and found that the pushed output condition yielded better comprehension and acquisition results. These questions are worth exploring because they contend with the issues of comprehension and production. That is, in view of the fact that the input and the interaction hypotheses are premised on the assumption that comprehensible input aids acquisition (Krashen, 1982; Long, 1983), and that the output hypothesis (Swain, 1985, 1995) is premised on the idea that production aids acquisition, it is theoretically important to investigate whether or not the two variables – input and production – aid 1) on-line *comprehension*, 2) *subsequent word recognition*, and 3) *subsequent word production* of L2 vocabulary. The present study pursued the following research questions:

1. What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' *comprehension* of directions containing new L2 words?

2. What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' ability to subsequently *recognize* new L2 words?

3. What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' ability to subsequently *produce* new L2 words?

The first question of the present study is posed in order to investigate whether input and output are helpful mediums through which to comprehend the meaning of the ten target items. The other two questions are posed in order to investigate whether comprehending the meaning of the target items promotes subsequent L2 word recognition and production. On the whole, it is my contention that it is theoretically interesting to see if there is a relationship between 1) comprehension and acquisition and 2) production and acquisition.

1.5. Relevance of the study

The present research project might make two contributions to the area of SLA. As there are few studies which have investigated incidental vocabulary learning through oral input (R. Ellis, 1994), the first contribution is to provide further empirical evidence to the input- and output-based theories by identifying the potential effects of *comprehensible input* − premodifed and interactionally modified − and *pushed output* on subsequent word recognition and production. Secondly, and perhaps more importantly, the present research project might take a step forward by investigating the incidental vocabulary learning of Brazilian EFL learners.

1.6. Organization of the thesis

The present thesis is organized as follows: Chapter 1, the introduction, contextualizes the present investigation by situating the objective of the study within the

area of vocabulary acquisition research; it also introduces the research questions which motivated the present study. Chapter 2, which presents the literature found relevant to the present study, is divided into three sections: the first section provides the dimensions of lexical knowledge; the second section presents the way in which L1 and L2 learners encounter words and also reviews previous reading research because incidental vocabulary learning has been investigated mainly from written input; and, the third section presents the input- and output-based SLA theories as well as previous research investigating the claims of these theories on the acquisition of L2 vocabulary. Chapter 3 describes the method that was employed in the present study. Chapter 4 contains the analysis and discussion of the results in light of the research presented in Chapter 2 and on cognitive psychology, which views L2 learners as limited-capacity information processors. Finally, Chapter 5 presents a summary of the findings, the limitations of the study, suggestions for further research, and pedagogical implications.

CHAPTER 2

REVIEW OF THE LITERATURE

This review of the literature is divided into three broad sections. In the first section, the dimensions of lexical knowledge – namely what it means to know a word and the factors that influence L2 vocabulary acquisition – are presented. In the second section, the way in which L1 and L2 learners encounter words is provided; also a review of previous reading research is presented, as incidental vocabulary learning has been investigated mainly from written input. Lastly, the input- and output-based SLA theories are presented in the third section along with a review of previous studies investigating their claims with regard to L2 vocabulary acquisition.

2.1. Dimensions of lexical knowledge

2.1.1. *What does it mean to know a word?*

The bulk of the literature on vocabulary research seems to indicate that, in coming to learn a word, various features are involved (Nation, 2001; Laufer, 1997; Sökmen, 1997). Nation (2001), for instance, finds that familiarity with form, meaning, and use are key elements in knowing a word (Nation, 2001, p. 26). *Familiarity with form* entails spoken and written form as well as recognizing the different word parts. *Meaning* refers to familiarity with form, knowing what the word means in the particular context in which it just occurred, concepts and referents, and associations. Moreover, *use* requires knowing the grammatical functions, collocations, and constraints of the word (p. 27). In addition to form, meaning, and use, Nation emphasizes that knowing a word also involves receptive and productive knowledge. On the one hand, receptive knowledge involves perceiving the

form of a word while listening or reading, and retrieving its meaning. Productive knowledge, on the other hand, involves the ability to express a meaning through speaking or writing, and retrieving and producing the appropriate spoken or written word form (Nation, 2001, pp. 24-25).

Conversely, some researchers have opted to stay away from the receptive/productive dichotomy (Teichroew, 1982; Hatch & Brown, 1995; Sökmen, 1997). These scholars do not see acquisition of vocabulary as either knowing or not knowing; instead, knowledge falls on a continuum and a learner can be anywhere along the continuum (Hatch & Brown, p. 371). Sökmen (1997) voices this perspective by asserting that it is highly unlikely for L2 students to "grasp even one meaning sense of a word in one encounter, let alone all of the degrees of knowledge inherent in learning a word " (p. 241). It seems more reasonable to accept that a more accurate understanding of a word will emerge as the student meets the word through a variety of activities and in different contexts.

Researchers who believe in a continuum of knowledge suggest that learners may learn basic core meanings of words sufficiently to understand what they hear or read without knowing enough about the syntactic restrictions, register appropriateness, or collocations to be able to produce the words on their own (Sökmen, 1997; Hatch & Brown, 1995). They propose that there are different ways to "know" a word, that what is considered sufficient knowledge under one circumstance will probably not be sufficient under others (Hatch & Brown, 1995, p. 370).

Whether one chooses to view knowledge as dichotomous or as a continuum, what is undeniable is the fact that there are many building blocks involved in learning a word.

Thus, in the present study, knowing a word will be defined as being able to recognize and produce the basic core meaning of ten words related to the kitchen (as in Ellis et al., 1994).

2.1.2. *Factors that influence L2 vocabulary acquisition*

Vocabulary research has shown that certain features can either delay or facilitate vocabulary learning. One such feature is part of speech. Research indicates (N. Ellis, 1994; Ellis & Beaton, 1993a; R. Ellis, 1994; Brown, 1993; Laufer, 1997) that in the early stages of learning, nouns are easier to acquire than adjectives, verbs, and adverbs. Some researchers posit that concrete nouns (e.g., *dog*, *chair*) are easier to learn than abstract nouns (e.g., *hope*, *understanding*), but Laufer (1997) cites the work of Stock (1976) to argue that concreteness of words in itself cannot ensure ease in learning. In Stock's (1976) work, it is reported that English-speaking learners of Hebrew had more difficulty in learning two types of *blue* in Hebrew (*kachol/tchelet*) than in learning abstract nouns (p. 150). From this evidence, it becomes evident that different languages classify items of experience differently and for that reason, learning FL concrete nouns will be easy whenever there is a one to one mapping of meanings represented by the native and foreign words (Ellis & Beaton, 1993a, p. 564)

In fact, this last point brings us to the next feature: imageability. Ellis and Beaton (1993a) propose that words which arouse a mental image are easier to acquire than words which do not have this capability. It seems reasonable to suggest that concrete words are easier to describe than abstract words because the former are easier to visualize. In a similar vein, R. Ellis (1994) posits that a degree of correlation between form and meaning facilitates the learning of words. Examples of this feature might be the onomatopoeic words *boom* and *crush*.

Another feature which might delay or facilitate vocabulary learning is distinctiveness of word form (Ellis & Beaton, 1993a) or, as Laufer (1997) defines it, *synformy*. A word with a distinct form is easier to learn than a word that is similar in form to another because learners may confuse words that sound or look alike (Ellis & Beaton, 1993a; Laufer, 1997).

Moreover, length of word form may affect vocabulary learning. R. Ellis (1994) suggests that learners remember monosyllabic words with much more ease than polysyllabic words, presumably because of the processing strategies learners use. He adds that learners may exert more time and effort in learning longer than shorter words (p. 9). Likewise, Ellis and Beaton (1993a) point out that longer words entail remembering more information, as a consequence of which there is more room for error (p. 568). Conversely, Laufer (1997) proposes that it is the quantity of the input that contributes to the ease or difficulty of vocabulary learning more than the length of the word. While there may be some truth in her argument, especially when learners are acquiring vocabulary in naturalistic environments, word length may play a stronger role in controlled experimental situations where equal exposure to all the vocabulary is necessary (N. Ellis, 1994).

Additionally, phonology and orthography are features which seem to play a role in vocabulary learning (Laufer, 1997; Ellis & Beaton, 1993a). In other words, if words are easy to pronounce or to spell in the L2 because the L1 system is easy to transfer, these words may be easier to acquire (Ellis & Beaton, 1993a). This may imply that Japanese learners may have more difficulties in learning English than perhaps Spanish speakers who make use of the Roman alphabet. Nevertheless, the results from the present research project revealed that the mother tongue, Portuguese, hindered the acquisition of some vocabulary words (see subsection 4.2.2).

A last feature in vocabulary learning is saliency – the importance of a word (Brown, 1993, p. 265). While all the aforementioned features play a significant role in acquiring vocabulary, if the learners deem a word to be unimportant, it is quite likely that the word may go unnoticed. This feature seems to be essential for input studies because, as Coady (1997) states, "[i]f the language is authentic, rich in content, enjoyable, and, above all, comprehensible, then learning is more successful" (p. 284). In other words, deeming the words to be important either in a controlled experiment or in a natural environment may increase the likelihood of their being acquired.

In sum, the discussion above shows that the acquisition of lexical knowledge depends on several features. In light of this intricacy, in the present research project I chose to investigate the basic core meaning of ten concrete nouns. That is, I did not investigate collocations, associations, abstract nouns, verbs, adjectives, or adverbs.

2.2. Encountering words: intentional vs. incidental learning

As mentioned in the first chapter, there are two main ways in which students learn L1 and L2 vocabulary: intentional learning and incidental learning. The former type of learning is defined as being designed, planned for, or intended by the teacher or student (Hatch & Brown, 1995). In other words, intentional learning involves an explicit approach to learning word meanings (Beck & McKeown, 1991). Incidental learning, on the other hand, does not involve an explicit approach to learning word meanings; learning incidentally is a by-product of doing or learning something else (Hatch & Brown, 1995). These sources of vocabulary learning have been investigated in the area of L1 and L2 reading research.

In L1 reading research, for example, Nagy and Herman (1987) and Drum and Konopak (1987) advocate incidental learning. The former argue that explicit vocabulary instruction cannot account for a substantial increase in overall vocabulary size. They state that an average high school senior's vocabulary is more or less 40,000 words. This number would imply that during the school years, students learn around 3,000 words per year (p. 21). Because this number is rather high, Nagy and Herman feel that vocabulary instruction alone cannot account for all the vocabulary that is learnt. In other words, Nagy and Herman argue that a course on vocabulary would not be able to teach 3,000 words per year. This leads them to believe that incidental learning is the major source of vocabulary learning. In sum, the thrust of Nagy and Herman's (1987) paper is to show that vocabulary instruction, although beneficial, does not promote large overall gains in vocabulary learning. They strongly advocate reading because students are likely to encounter an array of words in different contexts.

Taking into account that words have multiple meanings, Drum and Konopak (1987) believe that people come to distinguish these meanings by learning words in context, that is, through incidental learning. They specifically present four sources from which they believe students obtain word meanings. They are 1) the learning goal, 2) the underlying conceptual structure for the topic of the text, 3) prior mental representations, and 4) the verbal context in which a particular word is found (pp. 75-81). Although the cues included in the verbal context are helpful, the authors feel that the conceptual structure for the topic and prior knowledge are more critical than the other two sources. Their claim is grounded on evidence from a longitudinal study (Konopak, 1984; cited in Drum & Konopak, 1987) that was conducted with students learning physics terms with informal and formal textual material (p. 80). Konopak concluded that learners were able to learn word meanings from

context but the information learned was lost over time. Based on this information, the author concluded that in order for students to retain word meanings over time, they must have prior knowledge of the topic. In short, the authors claim that knowledge of topic domain is crucial for context learning; otherwise the contextual cues embedded in textual material will limit word meaning to a level of recognition as opposed to deeper word knowledge (p. 85).

In the same vein, Sternberg (1987) posits that most word meanings are learned from context, that is, incidentally. Sternberg, nevertheless, sees training students in vocabulary-learning skills as a profitable endeavor. He does acknowledge that certain methods are quite effective for teaching specific vocabulary (e.g., keyword method) but, as the majority of words are learned from context, he maintains that vocabulary-learning skills are an efficient way of learning vocabulary in general.

To this end, he proposes teaching three ingredients for learning vocabulary skills:

1) processes of knowledge acquisition –

> *selective encoding* (separating relevant from irrelevant information for the purposes of formulating a definition), *selective combination* (combining relevant cues into a workable definition), and *selective comparison* (a process by which new information about a word is related to old information already stored in memory) (Sternberg, p. 91)

2) contextual clues –

> *temporal cues* (the duration or frequency of X), *spatial cues* (the location of X), *value cues* (the worth or desirability of X), *stative descriptive cues* (properties of X such as size, shape, color), *functional descriptive cues* (possible purposes of X), *causal/enablement cues* (possible causes of or enabling conditions for X), *class membership cues* (classes to which X belongs), and *equivalence cues* (the meaning of X, or contrasts to the meaning of X) (Sternberg, pp. 91-92)

3) moderating variables –

> *number of occurrences of the unknown word, variability of contexts in which multiple occurrences of the unknown word appear, importance of the unknown*

word to understanding the context in which it is embedded, helpfulness of surrounding context in understanding the meaning of the unknown word, density of unknown words, and *usefulness of previously known information in cue utilization* (Sternberg, pp. 92-94)

The experiments that Sternberg conducted aimed at finding which of these ingredients was most helpful. In his third experiment, he divided 150 participants into five 30-member groups. The three experimental groups received training in one of the three ingredients and had some practice exercises; one control group received a list of 75 extremely rare words and was asked to memorize the definitions; the second control group received the same practice exercises as the experimental groups but without any training. The findings showed that the students in the experimental groups fared better than both control groups. Of the two control groups, the ones who received the practice exercises did better than the group who was simply asked to memorize the words' definitions. Of the three ingredients, using contextual clues was the least facilitative (p. 103). In short, the experiment showed that teaching students some skills to further enhance incidental learning from context is helpful.

Investigators in L2 reading research have also set out to explore whether L2 learners readily acquire vocabulary intentionally or incidentally. Krashen (1993b, cited in Zimmerman, 1997), for example, argues that learning from context, especially through reading, promotes vocabulary acquisition. Paribakht and Wesche (1997), nevertheless, disagree on the potential benefits of incidental learning on grounds that incidental learning through reading is a slow process and "there is no way to predict which words will be learned, when, nor to what degree" (p. 174).

In a longitudinal study carried out by Paribakht and Wesche (1997), 38 ESL learners in a university context were exposed to two conditions: 1) Reading Plus, and 2)

Reading Only. Participants in both conditions read four texts and answered comprehension questions but only the *reading plus* condition received enhanced vocabulary activities and the *reading only* condition read more texts and answered more comprehension questions. The enhanced vocabulary activities included exercises to draw the learners' attention to the target words, as well as recognition, manipulation, interpretation, and production exercises (pp. 183-184). The investigators concluded that learners in both conditions – intentional *reading plus* and incidental *reading only* – showed significant gains over a period of three months, but only the *reading plus* condition allowed the learners to move from a recognition-only level.

In a study conducted by Watanabe (1997), 231 Japanese EFL students from four universities were exposed to modified written input in order to investigate how different text modifications would affect students' incidental vocabulary acquisition. The text modifications employed were appositives, marginal glosses, and multiple-choice marginal glosses (p. 290). Additionally, translations of word meanings were required of certain groups to see if this measure would promote retention. Students were randomly assigned to one of ten conditions and at the end of each reading passage students answered five comprehension questions. Those students who were in the translation conditions were also supposed to provide translations for the new words.

Furthermore, the research design followed by Watanabe (1997) was executed in two sessions. The first session consisted of a pretest and a questionnaire, the treatment, a proficiency (cloze) test, and a posttest where students had to give a translation. The second session, which was carried out a week from the first session, consisted of two delayed posttests: one 10-minute test assessing the words in isolation and a 15-minute test assessing the words in context. The findings from these tests show that overall the students

in the gloss and multiple-choice gloss conditions did significantly better than those students in the appositive, original, and control conditions. In other words, input modifications in written texts which make the word meanings more salient appear to aid the incidental learning of vocabulary.

Morrison (1996) also conducted a study on lexical inferencing procedures with 20 learners – ten of high proficiency and the other ten of low proficiency – of French as a second language. Unlike Watanabe (1997), the written text that Morrison used was not modified; that is, the text was authentic. She targeted 12 unknown words and placed the participants in pairs – five high proficiency pairs and five low proficiency pairs. In think-aloud protocols, pairs of students were to arrive at word meanings without prior instruction. Morrison found that high proficiency learners made effective use of contextual and linguistic cues, while the low proficiency learners relied much more on contextual clues than on linguistic cues and were not as effective. An additional finding of Morrison's study is that low proficiency learners had major difficulties with lexical items other than the ones being targeted.

In a review article on incidental L2 vocabulary acquisition, Huckin and Coady (1999) outline main findings concerning the incidental learning issue. They point out that in order for incidental vocabulary acquisition to occur, learners must possess "a basic sight-recognition vocabulary of at least 3,000 word families" (p. 190). In addition, multiple exposure to a word in different contexts is necessary for incidental learning to take place, which means that the learning is incremental (p. 185).

Overall, these studies suggest that L2 learners do use context to arrive at word meanings. However, L2 learners, especially low proficiency learners, may not always be successful at using context and, thus, may arrive at erroneous guesses. As Morrison (1996)

and Huckin and Coady (1999) point out, lack of vocabulary knowledge may prevent them from using context successfully.

In light of the findings listed above, it might appear that incidental learning is not helpful. However, only more investigations on this matter will shed light on how exactly incidental acquisition occurs. As Hatch and Brown (1995) point out, "there is a definite gap between what is taught and what is known [and as a consequence], more attention needs to be given to the issue of incidental vocabulary learning" (p. 369). In fact, little is known about incidental L2 vocabulary learning from oral input (R. Ellis, 1994). Thus, the next section presents how SLA theories have dealt with incidental vocabulary acquisition from oral language.

2.3. Input- and output-based SLA theories and vocabulary acquisition

The theoretical background to the present research project includes the input hypothesis (Krashen, 1982), the interaction hypothesis (Long, 1983), and the output hypothesis (Swain, 1985, 1995). The input-based theories – the input and interaction hypotheses - are presented first and are followed by the output hypothesis. After laying the theoretical background, a review of empirical studies investigating the effects of three linguistic environments related to the hypotheses above – input, interaction, and output – on L2 vocabulary acquisition will be presented.

2.3.1. Comprehensible input

Research in developmental psychology has demonstrated that children receive modified input to make the L1 learning process more manageable (Harris & Coltheart, 1986). In L2, language modification has become a topic of interest, but also of much

controversy (Young, 1989; White, 1986, McLaughlin, 1987; Aston, 1986**,** among others). While investigators do not disagree on the importance of *input* in L2 language learning, they do hold different views on the relationship between input and acquisition. That is, not all researchers support the claim that comprehensible input is the only external variable responsible for acquisition.

Although Krashen (1982) has become the target of much criticism (Gregg, 1984; McLaughlin, 1987), his input hypothesis is important because it attempts to answer how an L2 is acquired (p. 20). Krashen (1982) proposes that L2 learners acquire language by focusing on the meaning, and not the form, of messages (p. 21). To better understand this position, it is important to note that Krashen draws a distinction between acquisition and learning. He posits that adults go through two routes to develop their language competence: 1) through acquisition, which he defines as a subconscious process similar to the way children acquire their first language; and, 2) through learning, which he defines as a conscious process in which adult learners learn rules and are able to talk about them (p. 10). He states that "language acquirers are not usually aware of the fact that they are acquiring language, but are only aware of the fact that they are using language for communication" (p. 10). Drawing on this distinction, Krashen postulates that adult L2 learners can acquire language by focusing on the meaning of the message (p. 21).

To further bolster his argument, Krashen brings evidence from L1 acquisition in children. He observes that the language that is addressed to children, known as caretaker speech, is not a direct attempt to teach the language but rather to aid comprehension (p. 22). He also notes that caretaker speech focuses on the immediate environment, or the here and now, which in turn provides extra-linguistic support for the child; that is, these characteristics of caretaker speech allow the child to understand the language directed at

him (p. 23). Language modifications can also aid adult L2 learners (p 24). Krashen points out that L2 learners receive modified input through foreigner-talk and teacher-talk. Foreigner-talk, or modifications made by native speakers to address non-native speakers, aims at communicating messages and not at teaching language. Similarly, teacher-talk, or foreigner-talk in the classroom, is also modified and pictures and realia are used to provide a relevant context to aid the learner in comprehending (pp. 24-25). To sum up, Krashen postulates that adult L2 learners acquire language by focusing on the message, not on the form of the input, and extra-linguistic cues are used to reach comprehension. It is also important to point out that verbal production on the part of the learners is not seen as necessary to acquire the language.

In short, the input hypothesis is formulated as follows: (1) The input hypothesis relates to acquisition, not learning (p. 21); (2) learners acquire an L2 by understanding language that contains structure a bit beyond their current level of competence ($i + 1$), with the help of context or extra-linguistic information (p. 21); (3) when communication is successful, when the input is understood and there is enough of it, $i + 1$ will be provided automatically (p. 22); and finally, (4) production ability emerges; it is not taught directly (p. 22).

Long (1983) is another researcher who advocates that comprehensible input is the only external variable leading to acquisition. Unlike Krashen (1982), however, Long (1983) has focused solely on the conversational/linguistic interactions that take place in foreigner talk discourse (FTD), that is, in the exchanges between native speakers (NSs) and non-native speakers (NNSs) (p. 181). The interest here is on what NSs and NNSs do to help resolve communication breakdowns (p. 182).

Long (1983) has labeled the devices to resolve communication breakdowns as comprehension checks (e.g., *Do you understand?*), confirmation checks (*The library?*), and clarification requests (*What do you mean?*) (p. 182). The linguistic/conversational modifications that ensue as a result of communication breakdowns have come to be known as negotiation of meaning. Long (1983) postulates that negotiation of meaning is beneficial because an L2 learner, through the devices outlined above, would have opportunities to signal to his or her interlocutor that a communication breakdown occurred. As a result of these devices, L2 learners would thus obtain comprehensible input.

Long (1983) has drawn on indirect evidence, namely on research of hearing children of deaf parents, to sustain that comprehensible input facilitates acquisition (Larsen-Freeman & Long, 1991). He argues that the children's acquisition was either delayed or incomplete because comprehensible input was lacking. In short, Long (1983) formulates his interaction hypothesis, which is basically an extension of the input hypothesis (Krashen, 1982), as follows: 1) linguistic/conversational adjustments promote comprehension of input; 2) comprehensible input promotes acquisition; 3) linguistic/conversational adjustments promote acquisition (Long, 1983, p. 189).

Before presenting the relevant studies investigating these input-based theories in relation to vocabulary acquisition, the third hypothesis, which is part of the theoretical basis to the present research project, is presented.

2.3.2. Comprehensible output

As mentioned previously, Krashen (1982) disregarded output as playing an important role in the acquisition process. He made it clear that production would emerge as a result of input (p. 22); Swain (1985), however, thought differently. While she sees

comprehensible input as essential to the L2 acquisition process, she argues that comprehensible input is not enough to guarantee native-like acquisition (p. 236).

In 1985, Swain conducted a large-scale research project in a Canadian bilingual elementary setting. She set out to examine the communicative competence - consisting of grammatical, discourse, and sociolinguistic components – of sixty-nine children of grade 6. Each component consisted of written and oral examinations. In addition to these 69 learners, native speakers of French also took these examinations in order to allow for a comparison. The results of the non-native speakers were reasonable but not as good as the scores of the native speakers. In addition, NNSs did much better on the written sections of the exams than on the oral sections. As the 69 participants had been exposed to comprehensible input for seven years, lack of it could not be the reason for not achieving acquisition. As a result, Swain (1985) reasoned that comprehensible input was not enough to cause acquisition (p. 246).

Drawing on this evidence, Swain (1985) proposed that students lacked comprehensible output. She argued that students were conveying intended meanings successfully but were never provided with cognitive challenges; that is, they were not being required to analyze the grammar of the target language (p. 249). Thus, by allowing L2 learners to engage in production, learners would have the opportunity to deliver messages that are precise, coherent, and appropriate (p. 249). In other words, in addition to meaning, learners need to focus on form when delivering messages in order to acquire the language (p. 249). She thus proposes three functions for the output hypothesis: 1) output can help the learner notice his or her linguistic limitations; 2) output serves the learner as a hypothesis-testing device, and as a result, can generate negative feedback; and, 3) output can provide the learner with more metalinguistic knowledge (Swain, 1995, pp. 125-126).

To sum up, the output hypothesis claims that output is a driving force behind the acquisition process because it allows learners to develop more accurate language. (1995, p. 125).

The following section presents the empirical studies investigating the claims of the input- and output-based theories in relation to vocabulary acquisition.

2.3.3. *L2 vocabulary acquisition and comprehensible input and output*

This section presents four studies that have investigated the claims of the input hypothesis (Krashen, 1982), the interaction hypothesis (Long, 1983), and the output hypothesis (Swain, 1985, 1995). The first two studies address the input and the interaction hypotheses, and the last two studies address the three hypotheses.

Loschky (1994) set out to test the claims of both Krashen and Long's input-based theories. He was driven by one interest: finding whether comprehension was directly linked to acquisition since "… a direct causal relationship between comprehension and SLA [had not been] empirically established through experimental research" (p. 304).

To test the comprehension-acquisition relationship, Loschky resorted to vocabulary and syntax. For vocabulary, he utilized 34 concrete nouns, and for syntax, he employed two Japanese double-noun locative sentence structures with postpositional particles as acquisition targets (p. 309). The subjects for the study were 41 beginning-level learners of Japanese as a foreign language studying at the University of Hawaii at Manoa. Moreover, Loschky chose subjects from two different proficiency levels - the second and fourth semesters - to guarantee that the input would be beneficial. In other words, for input to be beneficial it has to be $i + 1$ (Krashen, 1982). This measure was taken to ensure that at least one group would end up benefiting from the input (p. 308).

Loschky's (1994) experimental design included a pretest, listening comprehension tasks, and a posttest. The pre- and posttests consisted of a vocabulary recognition section and a sentence verification section. The purpose of the pretest was to determine the "… degree to which old and new words were known and unknown" (p. 310). The posttest, on the other hand, served to measure the accuracy with which students recognized the 34 new words used in the tasks during the treatment. The listening tasks were 'information-gap' tasks and they had a twofold purpose: (1) online measures of comprehension of L2 input and (2) the acquisitional intervention (p. 311).

The three groups that were formed – a baseline input group (n=14), a premodified input group (n=14), and a negotiated interaction group (n=13) – received different input in the listening tasks. The baseline group listened to simple sentences composed of L2 vocabulary and structures to convey meaning in the tasks. Baseline input sentences were read to the learners only once, at normal speed, and no interaction was allowed. The premodified group listened to baseline input sentences that were followed by an additional sentence that was intended to clarify the first. The negotiated interaction group listened to the baseline input sentences and the tutors, who where native speakers, were strongly encouraged to add modified input spontaneously. Unlike the baseline and premodified groups, the participants in this group were entitled to negotiate for meaning.

Moreover, all three groups shared three control variables in order to test the comprehension-acquisition relationship in stricter terms. The variables were: amount of time, partial feedback, and exposure to new words. Learners were permitted to control the time they needed to carry out their tasks. Loschky took this measure because he felt that imposing a specific amount of time would prove detrimental to all groups. Partial feedback, feedback that notified participants when they had a wrong answer, was provided

to the three groups at the end of each trial to "… block arguments that any advantage in acquisition for the interaction condition was due solely to the natural provision of feedback rather than to the effect of comprehension itself" (p. 313). Finally, all learners were given a minimal level of exposure to all (new and old) vocabulary items before beginning each set of tasks. This measure was taken to minimize the effects that the negotiated interaction group would have. Otherwise, only the negotiated interaction group would be exposed to the new vocabulary terms through repetitions due to the nature of interaction.

Hypothesis 1 stated that negotiated interaction would facilitate learner comprehension relative to noninteraction and the results provide support. The negotiated interaction group had greater online comprehension of input than did either of the other groups for all tasks combined. Hypothesis 2 stated that premodified input would facilitate comprehension relative to baseline and interaction. However, "… a priori comparisons found no significant difference between the PM [premodified group] and BL [baseline group] groups on any task set" (p. 316). Hypothesis 3, which would be the most crucial for Loschky's study, stated that greater L2 comprehension would lead to greater L2 acquisition. The results provide no significant relationship between comprehension and acquisition. In other words, the negotiated interaction group did not acquire more word meanings than the other two groups.

In spite of the failure to show a direct link between comprehension and acquisition, significant gains in acquisition did take place in all three groups. Based on these results, Loschky suggests that the comprehension-acquisition relationship is more complex than the one postulated by the input-based theories. In addition, Loschky's study showed that interactionally modified input proved more beneficial than premodified input for the purpose of on-line comprehension.

In a similar vein, Ellis, Tanaka, and Yamazaki (1994) conducted a study in which they investigated the claims of Krashen and Long's input-based theories. They tested the effectiveness of these hypotheses via the use of word meanings – kitchen related lexical items. Their study was conducted with 206 Japanese students of English as a foreign language in two Japanese cities. Although the context was different for each group, the research design was the same. The Saitama study, which consisted of 79 participants, and the Tokyo study, which consisted of 127 participants, were divided into three groups: a baseline group, a premodified group, and an interactionally modified group.

The baseline group received baseline directions that had been obtained from an audio recording of two NNSs performing a version of the same listening task. The teachers read the directions at about 180 words per minute. A short pause between directions permitted the students to carry out each directive. Finally, no interaction was allowed between the teachers and the students. The premodified group listened to the premodified version of the directions. To obtain these directions, a NS gave the baseline directions to three students from the same population as those in the study. The NNS's had the chance to request clarification. These interactions were then audiotaped and transcribed. The premodified directions contained the redundancy evident in the interactions. However, the transcribed directions were adjusted "… in only one respect: If they became overly long, the object's name and location were repeated at the end" (p. 463). The directions were delivered more slowly (about 90 wpm). As in the baseline group, no interaction between the teachers and students was allowed. The students in the interactionally modified group listened to the baseline version of the directions. The directions were also delivered at the same speed as the baseline group (180 wpm). Unlike the baseline and premodified groups, the interactionally modified group was permitted to interact. The teachers encouraged the

Japanese students to interact by writing a number of formulae on the board for requesting clarification. There was no limit on the length of the interaction resulting from a single direction. Additionally, teachers were not allowed to use gestures, to ensure that comprehension of the task would be based only on spoken input.

A month prior to the treatment, a pretest was administered in order to choose the kitchen-related lexical items. Although all the participants performed the same listening task during the actual treatment, the directions they received changed in accordance with the type of input they received. The researchers measured the participants' degree of comprehension based on how successfully they followed directions on the listening task.

Moreover, they administered two post treatment tests and one follow-up test to measure whether there was any relationship between comprehension and eventual vocabulary acquisition, namely subsequent word recognition. The first posttest was given two days after the treatment and participants had to translate the target items into Japanese; the second posttest was performed by the participants one month after the second posttest and was the same as the first posttest except that the order of the lexical items was changed so as "… to mitigate against any possible test-taking effect" (p. 461); the follow-up test was performed about 2 ½ months after the treatment. This time the students had to match the target items with the correct place on the diagram of a kitchen.

Hypothesis 1 of the study stated that input obtained from interaction would differ in quantity, redundancy, and complexity from that of the baseline and premodified input. The results show that the interactionally modified group received more input (longer directions) and more redundant input (more repetition of the key items) as a result of the interaction that took place. However, only the interactionally modified group in the Tokyo study experienced more complex input. Hypothesis 2, which stated that the interactionally

modified group would achieve higher levels of L2 comprehension, was also supported. However, in the Tokyo study, the premodified group outscored the interactionally modified group on three directions. Thus, premodified input also facilitated comprehension in the Tokyo study. Hypothesis 3, which stated that the interactionally modified group would learn and retain more L2 words than the baseline and premodified groups, was only partially supported. That is, the premodified and the interactionally modified groups had higher scores than the baseline group but comparisons between the premodified and interactionally modified groups were less clear-cut. The interactionally modified groups fared better in the first posttest but lost their advantage in the second posttest and the follow-up test. Hypothesis 4 stated that learners who engaged in active negotiation would obtain higher levels of comprehension, but the results did not support this. Lastly, Hypothesis 5 stated that active participation in negotiating meaning would be advantageous for vocabulary acquisition, but this was also not supported.

In terms of comprehension, Ellis et al.'s (1994) study is parallel to Loschky's (1994) findings. That is, interactionally modified input facilitated more comprehension. Unlike Loschky, however, this study did show that interactionally modified input caused more vocabulary acquisition, namely subsequent word recognition than premodified input. While their results seem promising for the *input interaction hypothesis*, one factor renders Ellis et al.'s (1994) results dubious: time on task. Their study did not control for time on task and as a consequence, the interactionally modified groups took longer to complete the task than the other two groups (e.g., the control group in the Saitama study took 6 minutes and the Tokyo study took 10; the premodified group in the Saitama study took 10 minutes and the Tokyo study took 20; the interactionally modified group in the Saitama study and in the Tokyo study took 45 minutes). In fact, the researchers acknowledge that it is difficult to

say "… whether interaction aids comprehension simply because of the additional time and input it provides or because of qualitative features of the input that it creates" (p. 476). Despite Loschky and Ellis et al.'s studies showing contradictory evidence with regard to acquisition, the studies are nonetheless important because they draw attention to the fact that the research in this particular area is incomplete.

Ellis and He (1999) also investigated the effects of different conditions of exposure on the comprehension and acquisition of L2 words. That is, they tested Krashen's and Long's input-based theories, as well as Swain's *output hypothesis*. To accomplish this task, they chose 50 students from six intermediate-level classes studying English at an American university. Although most of the students were Asian, they had mixed L1 backgrounds. In addition, almost all of the participants had studied English for at least five years in their home countries.

The participants were randomly assigned to one of three groups: the premodified input group, the interactionally modified input group or the negotiated output group. The premodified input group listened to premodified instructions which were obtained from baseline directions. The directions were delivered at a slow rate (90 wpm) and interaction was not allowed. The interactionally modified input group listened to baseline instructions which were delivered at a normal rate (180 wpm). To encourage meaning negotiation, teachers wrote a number of formulae on the board to facilitate interaction for the participants. In the negotiated output treatment, once the participants received the matrix and the small pictures of furniture, the teacher helped the participants label the small pictures (in the premodified input group, the teacher quickly went over the names of the lexical items). Participants were then asked to write directions for each small picture. Once they finished, participants were placed in pairs to exchange directions. Negotiation of

meaning was encouraged in order to promote modification of their own output. The length of the treatment for each group lasted 45 minutes.

During the application of the treatment, the participants carried out directions which consisted in labeling a matrix picture with small pictures of furniture. Participants' comprehension scores were obtained according to how well they carried out each directive. Subsequent recognition and production of L2 words were evaluated by several posttests. Word recognition was measured through a picture-matching test and production of L2 words was measured through the replication of the treatment of the negotiated output group. That is, participants were put in pairs, had to write 10 directions, exchange them orally and then perform the picture-labeling test.

The results of the study show that the negotiated output group outperformed the other two groups in comprehension. As far as the input groups are concerned, the differences in comprehension were not statistically significant. As regards subsequent word recognition, once again the negotiated output group obtained significantly higher recognition scores than the other two groups on the three posttests. The difference between the input groups was significant only on the second posttest, with the interactionally modified group faring better than the premodified input group. Finally, with regard to subsequent word production, the negotiated output group also performed significantly better than the other two groups on the two posttests that measured the oral production of the 10 furniture-related lexical items. Again, the difference between the input groups was not statistically significant.

In terms of comprehension, Ellis and He's (1999) results contradict Loschky's (1994) and Ellis et al.'s (1994) findings. Whereas the first study shows no significant difference between the premodified input group and the interactionally modified input

group, the second and third studies clearly showed that the interactionally modified groups understood more than the premodified input group. With regard to word recognition, Ellis and He's (1999) study supports Loschky's (1994) findings but contradicts Ellis et al.'s (1994).

Finding an explanation for these contradictory findings is not an easy task. One can point to the time factor. Whereas Ellis et al. (1994) failed to control for time, Ellis and He (1999) implemented a time limit for the three groups. Loschky (1994), on the other hand, was more careful and had his three groups share three control variables: amount of time, partial feedback, and exposure to new words. He felt that time consumption was an inherent characteristic of interaction and to mitigate any arguments that the interactionally modified group performed better because more repetition of the words occurred, he provided all his participants with partial feedback, brief (1 second per word) exposure to the vocabulary items with their translation, and the time necessary to complete the task.

Despite Ellis and He's (1999) time implementation, they were unfair to their input groups. To be more specific, they had their modified output group write the names of the lexical items on their respective pictures. Furthermore, the participants in this particular group had the opportunity to write out directions for each lexical item. One must keep in mind that this type of exposure to the lexical items (written exposure versus oral exposure) may have provided the output group with a different type of processing, perhaps one that fostered more retention of the words.

The last study that tested the input-based hypotheses and the output hypothesis is de la Fuente (2002). She tested comprehension and acquisition of new vocabulary in relation to three condition types: *non-negotiated premodified input*, *negotiated input without output*, and *negotiated input plus output*. The subjects were 32 NSs of English studying

Spanish at Georgetown University. All the subjects performed two listening comprehension tasks[6] which were given in two 20-minute sessions on two consecutive days. Task 2 differed from Task 1 in that subjects had to place the objects in different parts of the room.

Three NSs of Spanish (Spanish instructors) gave the ten directions to the participants and each direction could last up to 1 minute. The tasks were repeated twice with the order of the items being changed on the second delivery and with the 1-minute-per direction limit enforced. Bearing this in mind, the *non-negotiated premodified input* group received the premodified instructions[7] at a slow rate and could not ask any questions; the *negotiated input without output* group received premodified instructions delivered at normal speed and negotiation took place; and, the *negotiated input plus output* group received instructions resembling those of the *negotiated input without output* group except that on the second round of the tasks, the NNSs reversed roles with the NSs. In other words, the NNSs gave task instructions to the NSs. This measure was taken to force the NNSs to produce the lexical items and to modify their own output as they gave the instructions.

Comprehension was measured by NNSs' ability to carry out the instructions during the first round of the two tasks. To measure subsequent word recognition and production of L2 words, three posttests were administered. The production test consisted of showing images of the target items to each individual participant; participants were to produce the name of the image in the L2 (Spanish). The recognition test consisted of reading each

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[6] de la Fuente's (2002) listening task is similar to the one in Ellis & He's (1999) study except that the target lexical items in de la Fuente's are indigenous words spoken in three different Latin American countries.
[7] Premodified instructions were obtained by having a NS and a NNS perform the tasks. The interactions that resulted mainly in definitions of the target lexical items were transcribed.

target item and participants were to translate the word into the L1 (English). The first test was administered immediately after the treatment; the second test 1 week after the treatment; and the third test 3 weeks later. The three tests were administered in order to measure the immediate and delayed effects of the treatment (p. 89).

The results of this study show that the *negotiated input without output* and *negotiated input plus output* groups attained higher levels of comprehension. This finding supports Loschky (1994) and Ellis et al. (1994) but contradict Ellis and He (1999). As regards subsequent recognition of L2 words, the finding that there was no significant difference between the input groups (*non-negotiated premodified input* and *negotiated input without output*) supports Loschky (1994) and Ellis and He (1999) but contradicts Ellis et al. (1994). However, de la Fuente found that with regard to word recognition, there was no significant difference between the negotiation groups (*negotiated input without output* and *negotiated input plus output*). This finding does not support Ellis and He (1999), who found the modified output group superior to the interactionally modified group. As far as word production is concerned, de la Fuente's findings support those of Ellis and He; that is, the difference between the input groups (*non-negotiated premodified input* and *negotiated input without output*) was not significant. Additionally, she found that the difference between the negotiation groups (*negotiated input without output* and *negotiated input plus output*) was significant. This finding is in line with that of Ellis and He (1999), whose results show that the modified output group was far superior to the interaction group. Overall, de la Fuente concludes that adopting an interactionist framework helps foster comprehension and recognition recall of L2 lexical items.

To sum up, vocabulary acquisition is "a complex process that involves establishing relationships between concepts, organization of concepts, and expansion and refinement of

knowledge about individual words" (Beck & McKeown, 1991, p. 790). Reading research has been one area that has attempted to understand how incidental vocabulary knowledge develops and whether or not an explicit approach to learning vocabulary is helpful. Also, research on incidental L2 vocabulary learning from oral input has been sparse. Thus, there is a need to replicate the existing studies. In fact, the review is helpful in showing that future studies must attempt to control the time factor in order to figure out if interactionally modified input is helpful on account of its qualities or because of the extra time it allows for input processing. With this in mind, the present research project aims at investigating the effects of premodified input, interactionally modified input, and pushed output on the acquisition of vocabulary by Brazilian EFL learners.

In the following chapter, the methodology that was used to carry out the present research project is described.

CHAPTER 3

METHOD

3.1. Objectives and research questions

The objective of the present study is to investigate the effects of three linguistic conditions – premodified input, interactionally modified input, and pushed output – on the comprehension and acquisition – receptive and productive - of ten L2 vocabulary items. The research questions it attempts to answer are:

1. What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' *comprehension* of directions containing new L2 words?

2. What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' ability to subsequently *recognize* new L2 words?

3. What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' ability to subsequently *produce* new L2 words?

In order to investigate incidental L2 vocabulary learning from oral input, the students were never exposed to the written form of the lexical items; extra-linguistic cues were also provided by presenting the vocabulary items in context, that is, items were all related to the kitchen (as in Ellis et al., 1994). In addition, three experimental groups were formed to answer the research questions: the input-only group, the input-interaction group, and the input-output group. A control group was deemed unnecessary because "earlier studies

ha[ve] found that learners receiving unmodified input always perform worse than learners receiving modified input" (Ellis & He, 1999, p. 300).

In short, the research design of the present study consisted of (a) a pretest, administered two weeks before the treatment; (b) the treatment, which varied for the three groups; (c) Posttest 1, administered immediately after the treatment; and (e) Posttest 2, administered one week after the treatment.[6]

3.2. Participants

The participants of this study were selected from the extra-curricular program at the Federal University of Santa Catarina (UFSC). This program is part of an extension project which is administered by FAPEU (Fundação de Apoio à Pesquisa e Extensão Universitaria). The program offers the following English courses: basic (Levels 1, 2, 3), pre-intermediate (Levels, 4, 5, 6), intermediate (Levels 7, 8), advanced (Levels 1, 2), conversation, a TOEFL preparatory course, and finally, English for Specific Purposes (Levels 1, 2). The program administers an in-house placement exam to those students who have never been enrolled in the extra-curricular program. Otherwise, the student would progress in the order of the courses listed above. Additionally, because the extra-curricular program is not an independent institution, the teachers they hire must be linked to UFSC.

Thirty intermediate-level students[7] participated in this study. Although an effort was made to recruit all volunteers from Level 7, this task proved impossible. Thus, from the 30

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[6] As mentioned above, the elicited data was collected with the participants on an individual basis. The treatment was thus given on different dates but I made an effort to give each participant Posttest 2 one week after they received Posttest 1.

[7] The reason for recruiting intermediate-level students is twofold: First, the tasks required a great deal of comprehension and lower-level students would perhaps find the tasks overwhelming; second, the tasks required students to engage in production and it was thought that intermediate-level students would be at a level where they could produce some language. In other words, higher-proficiency students would perhaps

participants, twenty-three were from Level 7 and seven from Level 8. It must be noted that I was the teacher of the Level 8 participants. To avoid any type of bias, I did not delegate participants to a particular group in advance. As an alternative, I met with the participants on an individual basis and came up with the following arrangement: the first participant was assigned to the Input-Only group, the second to the Input-Interaction group, the third to the Input-Output group, the fourth to the Input-Only group, and so on. I followed this organization until I had reached ten participants per group. Of the 30 participants, 14 were male and 16 were female. While Brazilian Portuguese was the L1 for the majority of the students, one student reported Spanish as her L1. Only three students reported having lived in an English-speaking country: one had lived in the United States for ten months, another in Holland for six months, and the third had lived in England for eleven months. Nine students reported having visited an English-speaking country for pleasure: eight had visited the United States for two weeks and one had visited Australia for one month. The age of the students ranged from 15 to 60 years, with an average of 21.

3.3. Instruments

The Pretest. The subjects took a test which contained a list of 129 English words (see Appendix A). To verify whether or not they knew the words, they were asked to provide one of the following options: (1) a definition either in English or Portuguese, (2) a synonym in English, or (3) a Portuguese translation. In addition to kitchen-related items, the list included distractors such as *turtle* and *cow*, and basic words that the students probably already knew. On the basis of the results, the 10 items selected were unknown to all of the students. They were: *pot, pitcher, rolling pin, jar, tongs, range, strainer, ladle, colander,* and *skillet*.

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find the tasks too easy and lower-proficiency students would find the tasks too difficult. The researcher aimed to strike a balance with the intermediate-level students.

Posttest 1. The purpose of Posttest 1 was to measure the immediate effects of the treatment. To this end, two vocabulary knowledge scales (VKS) – one productive and one receptive – were used (Wesche & Paribakht, 1996; de la Fuente, 2002). To avoid a test effect, the productive part of the test was carried out first, followed by the receptive part. In other words, the receptive part of the test entailed providing the names of the lexical items in English - the target language - and participants had to provide a Portuguese translation. Thus, if the receptive part of the test were to be given first, there would be a chance that participants might memorize the names of the lexical items. In fact, previous research (e.g., Ellis & He, 1999) showed positive results for the pushed output group but it could be argued that those results are biased on grounds that the researchers gave the receptive test before the productive one.

Productive Posttest 1: In the productive test, the researcher gave images of the target items to each individual participant. Participants had a productive knowledge scale consisting of four choices written in the participants' L1. The choices read as follows: (1) I have never produced the word in English for that image. I do not know it; (2) I have produced that word before, but I can't remember it; (3) I *think* that is a (participant had to provide a guess in English); and, (4) I *know* that is a (participant had to provide actual knowledge in English). (See Appendix B for the Portuguese version). As the participants examined each individual picture, they could choose one of the four options which best described their productive knowledge. The responses given by the participants were all recorded. It is important to note that I presented the participants with the pictures of the target words one at a time. That is, once having shown a picture to a participant and allowed him or her to respond, I did not go back to a previous one. After moving on to the next one, some participants asked to see the previous pictures but I followed this procedure strictly to make the test reliable.

Receptive Posttest 1: The receptive part of the test consisted of reading aloud the target words to each participant and having them choose an option from the VKS.   The VKS contained four choices which were written in the participants' L1.   The choices were: (1) I do not remember having heard that word before; (2) I have heard that word before, but I do not know what it means; (3) I have heard that word before, and I *think* it means (opting for this choice required a Portuguese translation of the target item); (4) I *know* that word.   It means (selecting this option required providing a Portuguese translation of the target item) (See Appendix C for the Portuguese version).   The researcher read aloud each target word twice, at which point the participants had to choose which option best described their receptive knowledge.   Their responses were also recorded.   Posttest 1 – productive and receptive – was administered immediately after the treatment.

Posttest 2.   The purpose of Posttest 2 was to measure the short-term delayed effects of the treatment.   Participants took this test on different dates because I collected the data on an individual basis.   However, an effort was made to give the test approximately one week after Posttest 1 had been administered.   The procedure was similar to that in Posttest 1 except that the order of the words, both in the productive and receptive part of the test, was changed to eliminate effects of the previous assessment session.   For *productive posttest* 2 and *receptive posttest* 2 see Appendix B and C, respectively.

3.4. Treatment

The treatment provided to all three groups involved the use of either a reciprocal or a non-reciprocal task.   As mentioned previously, reciprocal tasks require a two-way flow of information between a speaker and a listener and non-reciprocal tasks require a one-way flow of information from a speaker to a listener (Ellis, 2001).   These tasks were divided into two

ten-minute sessions. The reason for having two sessions is twofold: 1) two sessions were provided to expose the learners to the words; and 2) the second session was taken as a measure to push the learners from the input-output group to engage in verbal production; that is, during the second ten-minute session, learners from this group gave ten directions to me. Furthermore, the subjects were given a handout (see Appendix D) which contained a matrix picture of a kitchen, fifteen numbered objects depicting kitchen-related items – these were the ten target items as well as five distractors, and a set of locational expressions. It must be added that the matrix picture of the kitchen had its compartments labeled (i.e., cupboard, sink, shelf) as they were not the target items. The only unlabeled component was the top part of the stove, the *range*, since this was one of the target items. This measure was taken to reduce the cognitive load of the task (i.e., participants had one minute per direction and approximately fifteen seconds to make their choice). Depending on the group to which they were assigned, a set of Portuguese instructions was given to them to avoid any ambiguities as to what was expected of them. Basically, the participants were asked to either listen to directions, or, in addition to listening to the directions, to produce directions that gave instructions about where to place the kitchen-related objects in the matrix picture of the kitchen. Comprehension was measured by how accurately participants chose the target item to place it on the matrix picture. Hence, a separate test to measure comprehension was deemed unnecessary.

In the present study, the nature of the reciprocal and non-reciprocal tasks called for what is considered *incidental* learning. As mentioned in Chapter 2, whereas *intentional* learning is defined as being designed, planned for, or intended by the teacher or student, *incidental* learning is a by-product of doing or learning something (Hatch & Brown, 1995, p. 368). Because the linguistic items embedded in the directions were the target items, it could be argued that the learning was *intentional*. However, I will argue that the learning involved in

the present study is better rendered as *incidental* on grounds that the task, whose primary goal consisted in carrying out ten directions, was composed of two secondary, but no less important, goals: first, participants had to choose the target item from among fifteen pictures representing kitchen objects – ten target items and five distractors; and secondly, they had to locate the place in the kitchen where the object had to be placed. In sum, the learning from this task is best characterized as incidental because the learning of the target items was a by-product of doing something else, namely carrying out the ten directions[8] (Hatch & Brown, 1995, p. 368).

The Input-Only treatment. Baseline directions were first obtained by asking a native speaker of American English to make up directions about where to place each of the kitchen-related items in the matrix of the kitchen. These directions were recorded and transcribed. Here is an example of the kind of directions he produced:

(1) *Put the ladle in the cupboard.*

Next, a student drawn from the same population as the subjects in the study listened to the baseline directions and negotiated meaning with the native speaker. The interactions were audio recorded and used to prepare the premodified directions. An example of a premodified direction is:

(2) *Put the ladle in the cupboard. A ladle is a spoon with a long handle and you use it to serve soup; so when you give soup to someone you use a ladle.*

Similar directions were prepared for the ten target items (See Appendix E).

I met with the ten students individually. Before giving the ten directions, I gave the subjects written Portuguese instructions (see Appendix F) to avoid any misunderstandings. Before giving the participants the handout, I gave the following instructions: 1) choose an

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[8] Participants were not aware that after performing the task, I would give them an immediate posttest. In fact, several students said that they had not been concerned about memorizing the names of the objects. Rather, their attention was focused on choosing the right numbered object from among fifteen objects and placing it on a specific area of the kitchen.

object and place its corresponding number in a specific place on the kitchen; 2) no questions are allowed; 3) you will have one minute to hear the direction, which will be repeated at least twice, and after the one-minute limit, you have fifteen seconds to make your choice; 4) once you write a number on the matrix of the kitchen, you are not allowed to make changes; 5) you will receive ten directions; 6) the activity will be repeated a second time but the order of the directions will be different and the directions will ask you to place the objects on different locations of the kitchen matrix. I then proceeded to read each direction at a slow rate. At the end of the first ten-minute session, I collected the handout and then proceeded with the second ten-minute session. This treatment took approximately 20 minutes.

The Input-Interaction treatment. Baseline directions were used in this treatment (see Appendix G). The instructor wrote a number of formulae for requesting clarification on the board (e.g., *What is a _____?, Could you repeat it again?, What is it used for?*). Before giving the directions, I gave the subjects written Portuguese instructions (see Appendix H) to avoid any misunderstandings. That is, I gave them the same instructions as the ones the Input-Only group received, with one exception: they were allowed to ask questions in English in order to understand the directions. To do so, they were encouraged to use the formulae on the board and any language that was comfortable to them, as in example (3):

> (3)   R (researcher): Place the tongs on the dish drainer.
>   S (student): Tongs?
>   R: Yes, the tongs.
>   S: And what is it used for?
>   R: It is a device for picking up objects, consisting of a pair of arms hinged together.
>   S: And what objects?
>   R: Ice cubes, for example.
>   S: Oh, yeah!

Once these instructions were given, I distributed the handout and proceeded to give the ten directions at a slow rate.

After the students had chosen the number of a kitchen-related item to place on the matrix picture of the kitchen, the teacher collected the handout and told the students that the task was going to be repeated. Again, the only difference between the first and second task was that the order of the kitchen-related pictures and the place where they were supposed to place them on the matrix of the kitchen changed. This treatment took approximately 20 minutes – each session lasted 10 minutes.

The Input-Output treatment. During the first task, the Input-Output group followed the same procedure as the Input-Interaction group mentioned above (see Appendix I). However, the second ten-minute session was different: the students in the Input-Output group reversed roles with the instructor. That is, the students gave me ten directions and I had to identify a specific kitchen-related object and write its number in a location on the matrix of the kitchen (see Appendix J). The students had one minute per direction. I advised the students not to use the number of the objects as a reference or to point to the object in focus. This measure was taken in order to push the students to engage in *comprehensible output*. That is, the objective was to push the students to produce the target items[9]. This treatment took approximately 20 minutes with each task lasting 10 minutes.

3.5. Analysis

Participants' comprehension was measured according to how well they carried out the ten instructions when placing the number pertaining to the small pictures on the matrix diagram during the first ten-minute session. For each correct directive they obtained 1 point with the maximum possible score being 10. Subsequent word recognition scores were obtained after

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[9] When the participants attempted to produce directions on-line, negative feedback was provided only when the name of the item was wrongly produced or confused. That is, if the participant failed to negotiate meaning of the target items, feedback was not provided.

students attempted to provide a Portuguese translation for the target words. Subsequent word production scores were obtained after students were cued with a picture of the target words; they had to produce the word in English. The minimum possible score on the vocabulary tests was 0 and the maximum 10.

This chapter presented the objective of the study and the research questions. It also provided a description of the participants, the treatment, the testing instruments, as well as the criteria used to measure comprehension and acquisition. The next chapter presents an in-depth discussion in view of the results obtained.

CHAPTER 4

RESULTS AND DISCUSSION

4.1. Effects of treatment on comprehension and vocabulary acquisition

4.1.1. Comprehension results

As stated in the previous chapter, comprehension was calculated as the ability to carry out a direction during the first ten-minute session of the task by correctly choosing the lexical item and placing its respective number on the kitchen matrix. Mean scores (M) and standard deviations (SD) are found in Table 1. As can be observed, the input-only group scored a mean of 8.6 out of 10, the input-interaction group 8.5, and the input-output group 8.1. While the input-only and the input-interaction groups scored slightly higher than the input-output group, the important thing to notice is that in terms of comprehension, the three groups behaved in a similar fashion. In fact, variability (measured according to the degree of standard deviation) within and across the three groups attests to the overall homogeneous behavior.

Table 1. Descriptive statistics for the comprehension scores

Group	N	M	SD
Input-only	10	8.6	1.6
Input-Interaction	10	8.5	1.6
Input-Output	10	8.1	1.1

4.1.2. Vocabulary Acquisition (Recognition)

Subsequent word recognition was operationalized as the ability to identify (translate into Portuguese) the target lexical items after listening to them during the tests. Table 2

presents the mean scores and standard deviations for the input-only group, the input-interaction group, and the input-output group on the two recognition tests.

Table 2. Descriptive statistics for the two vocabulary recognition posttests

		Test 1		Test 2	
Group	*n*	*M*	*SD*	*M*	*SD*
Input-Only	10	2.5	1.4	2.0	1.1
Input-Interaction	10	2.5	1.4	1.9	1.0
Input-Output	10	2.9	1.5	2.7	1.7

As can be observed from the table, on the immediate test (Posttest 1) the input-only group scored a mean of 2.5 out of 10, the input-interaction group 2.5, and the input-output group 2.9. Although the input-output group scored slightly higher than the other groups, overall the three groups behaved rather similarly, and variability (measured according to the degree of standard deviations) was consistent across the three groups. Furthermore, on the delayed test (Posttest 2), the scores for the three groups dropped. The input-only group scored a mean of 2.0, the input-interaction group 1.9, and the input-output group 2.7. Once again, variability (measured according to the degree of standard deviations) indicates the groups' homogeneous behavior. Nevertheless, only the input-output group seems to hold on to a stable score across time (from test 1 to test 2). That is, while the scores for the input-only and input-interaction groups decrease (-.5 and -.6 respectively), the score for the input-output group decreases the least (-.2).

4.1.3. Vocabulary Acquisition (Production)

Subsequent word production was operationalized as the ability to produce in English the lexical items presented through illustrations. Table 3 provides mean scores and standard deviations for the input-only, the input-interaction, and the input-output groups on the two production tests.

Table 3. Descriptive statistics for the two vocabulary production posttests

		Test 1		Test 2	
Group	*n*	*M*	*SD*	*M*	*SD*
Input-Only	10	1.1	1.2	.90	.57
Input-Interaction	10	1.2	1.0	.90	.99
Input-Output	10	1.4	1.1	1.30	.82

As Table 3 shows, on the immediate test (Posttest 1) the input-only group scored a mean of 1.1 words out of 10, the input-interaction group 1.2, and the input-output group 1.4. Furthermore, the standard deviations for the three groups (1.2, 1.0, and 1.1 respectively) indicate a low variability among the three groups; that is, their behavior in terms of scores did not vary considerably. On the delayed test, (Posttest 2), the input-only group scored a mean of .90, the input-interaction group .90, and the input-output group 1.3. As in Posttest 1, variability (measured according to the degree of standard deviation) was low in Posttest 2. However, it is worth mentioning that the input-output group, as in the vocabulary recognition test, was the only group to hold on to a similar score (immediate score was 1.4 and delayed score was 1.3).

Table 4 provides mean scores and standard deviations for the three groups on the comprehension test and on the two vocabulary recognition and production posttests.

Table 4. Descriptive statistics for the comprehension test and the two vocabulary posttests (production and recognition)

		Comprehension Test		Production Test				Recognition Test			
				P1		*P2*		*R1*		*R2*	
	N	M	SD	M	SD	M	SD	M	SD	M	SD
Input-Only	10	8.6	1.6	1.1	1.2	.90	.57	2.5	1.4	2.0	1.1
Input-Interaction	10	8.5	1.6	1.2	1.0	.90	.99	2.5	1.4	1.9	1.0
Input-Output	10	8.1	1.1	1.4	1.1	1.30	.82	2.9	1.5	2.7	1.7

M = mean performance
SD = standard deviation
P1 = immediate production test
P2 = delayed production test
R1 = immediate recognition test
R2 = delayed recognition test

This table collapses the results presented above and serves as a guide in answering the research questions to which I now turn.

The first research question asked about the relative effects of premodified input, interactionally modified input, and pushed output on learners' *comprehension* of directions containing new L2 words. The results of this study indicate that participants in all three input conditions attained reasonable levels of comprehension; learners in the input-only group had a mean comprehension score of 86%, those in the input-interaction group 85%, and those in the input-output group 81%. These results show that learners were quite capable of comprehending directions which had new words embedded in them. In the case of the input-only group, receiving previously modified directions seems to have contributed to their comprehension of the directives. In the case of the input-interaction group, having to negotiate meaning in order to get the target items simplified seems to have had a positive influence on their comprehension. It is likely that the input-output group scored lower (81%) because the participants knew they had to give directions in the second ten-minute session. As will be discussed in subsection 4.2.1, the cognitive load of the task, that is, having to speak in the second ten-minute session, forced the participants to be concerned with form – names of lexical items – rather than with overall meaning. In other words, the cognitive load of the task slightly hindered the input-output group's comprehension. In sum, the data show that, at least for the participants of the present study, comprehension of directions containing new L2 words is not favored by any of the three conditions above. That is to say, the three linguistic conditions – premodified input, interactionally modified input, and pushed output – were beneficial for the comprehension of directives.

It should be pointed out, nonetheless, that the findings of the present study are not consistent with the findings of Loschky (1994), Ellis et al. (1994), Ellis and He (1999) and

de la Fuente (2002). In Loschky's (1994) and Ellis et al.'s (1994) studies, the interactionally modified groups obtained higher comprehension scores than the premodified input groups. The findings in Ellis and He's (1999) study show that the modified output group scored significantly higher than the other two groups, but the difference between the premodified input and interactionally modified input groups was not statistically significant. In de la Fuente's (2002) study, the interactionally modified group and the pushed output group scored higher than the premodified input group. Recall that in the present study, all three conditions achieved reasonable levels of comprehension.

In the present study, the time factor may be one reason why the results do not show a clear-cut advantage for the input-interaction and the input-output groups. Recall that for each direction, participants had one-minute to carry out the directive. Loschky (1994), on the other hand, did not impose a time limit; he allowed his participants to decide when they wanted to move on to the next direction. He argued that imposing a time limit would restrict the interactionally modified groups' amount of interaction and that it would possibly irritate the learners in the baseline groups (i.e., the control group who received unmodified input) and the premodified input groups who might be forced to wait after they had already finished a task item (p. 313).

As in Loschky (1994), time was not controlled in Ellis et al.'s (1994) study. In fact, each group received different amounts of time with the interactionally modified group taking the longest: more or less 45 minutes. One of the criticisms aimed at these studies is the difficulty in deciding whether the advantage for the interaction groups lies in the quality of the input or in the extra time they had to process the input. For this reason, the present

researcher decided to impose a time limit[12] not only for each group but for each direction as well. Thus, in light of the data from the present research project, it seems reasonable to argue that when the time factor is controlled, the advantage for the interaction groups – the input-interaction and the input-output groups – diminishes.

The second research question addressed the effects of the various task conditions on learners' ability to subsequently *recognize* the target items. On the immediate recognition test (Posttest 1), the input-only group had a mean recognition score of 25%, the input-interaction group 25%, and the input-output group 29%. On the delayed recognition test (Posttest 2), the scores for the three groups decreased. The input-only group had a mean recognition score of 20%, the input-interaction group 19% and the input-output group 27%. Hence, although the scores decreased from Posttest 1 to Posttest 2, the input-output group appears to have the most stable score across time.

Although the scores on the immediate and delayed tests were relatively low for the three groups, they support Loschky's (1994) findings in which the interactionally modified group, which had obtained higher on-line comprehension, did not acquire more words than the premodified group. The results in the present study do not, however, support Ellis et al.'s (1999) findings in which it is clearly shown that the interactionally modified group had higher recognition scores than the premodified group. It is difficult to say whether the results in this study support Ellis and He's (1999) and de la Fuente's (2002) results on the immediate test. In the present study, the scores on the immediate test for the three groups are very similar (25%, 25%, and 29% respectively). However, in the light of the results on the delayed tests (20%, 19%, and 27% respectively), it seems reasonable to argue that the

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[12] It is likely that de la Fuente's (2002) participants in the interactionally modified and pushed output groups had an advantage over the premodified input group because she exposed them to two tasks which in turn were divided into two ten-minute sessions. In other words, there was a total of four minutes per direction.

input-output group had better word retention. Thus, the scores on the delayed test corroborate Ellis and He's (1999) and de la Fuente's (2002) finding in which the output groups had better word retention.

The third research question addressed the effects of the various task conditions on learners' ability to subsequently *produce* the target items. As regards production scores, on the immediate test (Posttest 1) the input-only group obtained a mean score of 11%, the input-interaction group 12%, and the input-output group 14%. On the delayed test (Posttest 2), the input-only group had a mean score of 9%, the input-interaction group 9%, and the input-output group 13%. Again, all the scores decreased from posttest 1 to posttest 2, but the only score that remained relatively stable across time is the input-output group's score (14% and 13% respectively).

Because the scores for the three groups (11%, 12%, and 14 % respectively) on the immediate production test are very similar, I will argue that these results are inconsistent with those of Ellis and He's (1999) finding in which the output group clearly outscored the input groups on the two posttests. The same thing can be said for de la Fuente (2002), who found that the interactionally modified and the output groups scored higher than the premodified group. However, considering that in the present study the input-output group's score on the delayed test dropped by only one percentage point (14% to 13%), it seems reasonable to argue that its word retention was more stable than the input-only and the input-interaction groups.

Overall the recognition and production scores indicate a similar behavior for the three groups. Thus, a response to the second and third research questions would simply be to dismiss premodified input, interactionally modified input, and pushed output as having a true effect on learners' ability to subsequently recognize and produce new L2 words.

However, an adequate account of the conundrum must deal with both (1) the groups' homogeneous behavior and (2) the small differences that did occur amongst the three groups. To shed light on the first piece of the conundrum – the groups' homogeneous behavior – three issues will be borne in mind: (1) the cognitive load of the task, (2) the intrinsic properties of words, and (3) the incidental/intentional learning dichotomy. The second piece of the conundrum – the slight differences that did emerge amongst the three groups – will be explored in section 4.3.

4.2. Plausible factors generating homogeneous behavior

4.2.1. Cognitive load of the task

The task that was employed in the present study required participants to carry out ten directives in ten minutes; that is, one minute was allocated for each direction. The task consisted of a kitchen matrix with its various locations written out and fifteen pictures representing kitchen-related objects – ten target items and five distractors. The different kitchen sections were labeled because the names of those sections were not being targeted[13]. However, the labeled kitchen sections as well as the visual adverbials of position were primarily supplied in an effort to lower the task's cognitive load.

Despite these measures, the results seem to indicate that the task's cognitive load heavily taxed the participants. Note that the criterion used to judge cognitive load is based on the different steps the participants had to carry out to complete the task. In Table 5, a breakdown of the different demands placed upon each group is presented.

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[13] The only section that was not labeled was 'range' because this was a target item. Instead, a picture representing a 'saucepan' and its written form were provided in order for participants not to waste time selecting the object from among fifteen pictures.

Table 5. Breakdown of task description

Group	First ten-minute session (one minute per direction)	Second ten-minute session (one minute per direction)
Input-only: least cognitively loaded	a. Premodified input b. No interaction c. Listening-only	a. Premodified input b. No interaction c. Listening-only
Input-Interaction: more cognitively loaded	a. Baseline input b. Interaction c. Listening and 'limited' production	a. Baseline input b. Interaction c. Listening and 'limited' production
Input-Output: most cognitively loaded	a. Baseline input b. Interaction c. Listening and 'limited' production	a. Participants give ten directions b. On-line production

As can be observed, the participants in the input-only group were not allowed to interact with the researcher. Nonetheless, the directions that they received had been previously modified, and as a result, the participants were only engaged in listening. In other words, not having to engage in production allowed the participants to solely focus on the input and begin processing the directions. Again, because no production from the participant was required, the researcher was able to read the directions at least twice. In the second ten-minute session, the same procedure as the first ten-minute session was followed. The nature of the task for the input-only group allowed the participants to have up to two minutes to hear the simplified directions.

In the first ten-minute session, participants in the input-interaction and input-output groups were exposed to the same type of input, baseline input. Baseline input was not simplified *a priori*, and as a result, participants had to negotiate meaning to obtain comprehensible input. The following conditions increased the burden for the participants: they had one minute to listen to the baseline directions and to engage in 'limited' production had they failed to understand the directions. 'Limited' production refers to

formulae (e.g., *What is a _____?, Could you repeat it again?, What is it used for*?) that was given to the participants to encourage them to request clarification. Allocating one minute per direction did not permit the participants to hear comprehensible input for a full sixty seconds. Thus, listening and engaging in 'limited' production simultaneously increased the cognitive load of the task (Barsalou, 1992, pp. 79-80). In the second ten-minute session, the input-interaction group followed the same procedure as the first session.

The input-output group, on the other hand, reversed roles with the researcher in the second ten-minute session. More specifically, the participants were asked to produce ten directions on-line. This measure was taken to push the participants to produce the target items. Imposing these conditions greatly increased the load of the task. The following steps bear out the task's burden: First, participants had to formulate a direction; secondly, to make up the direction, they had to retrieve the name of the target word; third, if lexical retrieval was unsuccessful, they were allowed to negotiate meaning; however, negotiating meaning requires time and the one-minute limitation proved to be rigorous. In an attempt to push the participants to remember the name of the target items, they were told not to refer to these items by their respective number. Furthermore, to try to focus only on their oral input, the instructor avoided making eye contact with the participants. In short, the nature of the task, as described above, shows that the input-only group had the least cognitively loaded task; the input-interaction had a slightly more cognitively demanding task; and the input-output group had the most cognitively loaded task.

The remainder of this subsection will embrace a concept - that learners are limited-capacity information processors – taken from the field of cognitive psychology (McLaughlin, 1987, p. 136) and based on Skehan's (1998) dual-coding approach to cast light on the groups' homogeneous behavior despite being exposed to different conditions.

First of all, McLaughlin views second language learning as the learning of a complex cognitive skill (p. 133). The skill is rendered complex because it is composed of sub-skills that must be automatized in order to pave the way for the higher order skill. In the present study, L2 comprehension and production (see subsections 4.3.1 & 4.3.2) are considered higher order skills. Generally speaking, comprehension is both data-driven and conceptually driven. Data-driven processes require understanding of phones, phonemes, and clauses; conceptually-driven processes require having knowledge of vocabulary and the context or world knowledge (Fotos, 2001). Thus, efficient comprehension requires a mixture of bottom-up and top-down processes.

Within the framework of cognitive psychology, two main processes are believed to guide learning: controlled and automatic processes. When learners are faced with new information, controlled processes come into play (McLaughlin, 1987). These processes tax the attentional resources of the learner because they have not been automatized. Only when these processes become automatic can learners free up attentional resources which can be directed towards the learning of new skills (McLaughlin, 1987). The purpose of discussing controlled and automatic processes is to show that the participants in the present study were engaged in understanding and learning new lexical items, although these items were indirectly presented through directions. Specifically, participants were engaged in carrying out a task that had not been previously automatized.

The relevance of the limited-capacity concept becomes clear when we recall that, in the present study, learners had to carry out ten directions in which ten new lexical items were embedded. In other words, as I am arguing that the learning that took place is described as incidental (see subsection 4.2.3), the targeted vocabulary could not be taught explicitly. For this reason, the targeted vocabulary items were placed within directions.

Moreover, controlled processes came into play, not only as a result of the newness of the vocabulary items, but also as a result of having to carry out different steps (as shown in Table 5) to complete the directions. In this sense I am arguing that the participants' underlying system was far from being capacity-free; that is, participants' attentional resources were consumed by the task's cognitive burden.

The novelty of the words, and thus the lack of automatic processes such as automatic retrieval, is not the only explanation for the similarity in the groups' performance, however. We must not forget that each direction stipulated a one-minute limitation. For this reason, it is crucial to explore the effects of this limitation on learners' performance. To shed light on this issue, the discussion will draw on Skehan's (1998) dual-mode approach.

Skehan (1998) suggests that language learning and language performance occur due to the existence of two systems: one relies on structure and rule and the other relies on chunk-based language and idiom (p. 7). The former drives interlanguage change forward and the latter aids on-line computation. Additionally, he claims that adult learners prioritize meaning over form; a claim that is in line with Van Patten's (1989) research. It will be claimed that the one-minute limitation used in the present study resembled real-time processing.

Naturally biased towards meaning, and having one minute to process each direction, learners were forced to devote few attentional resources to form. The on-line computation forced the learners to rely on the exemplar-based mode; this refers to a system that relies on lexicalized or memorized chunks of language (Skehan, p. 35). In the present study, for example, learners in the input-output group did not have to formulate directions from scratch because the places on the matrix of the kitchen were labeled (e.g., sink, trashcan,

cupboard) and some locational expressions (e.g., in front of, under, behind) were written. Thus, participants used these chunks to produce directions on-line. Skehan argues that the exemplar-based mode is activated when the learner is engaged in real-time production and comprehension in order to keep up with the demands of real-time processing. That is, in carrying out the first ten-minute session, learners in the three groups resorted to comprehension strategies; namely, they were able to use contextual and schematic knowledge (Skehan, p. 14). Whereas the contextual knowledge derived from the kitchen matrix and the kitchen objects, the schematic knowledge was drawn from their global knowledge about kitchens.

Recall that in the second ten-minute session, the input-only and the input-interaction groups performed the same task as in the first, and the input-output group had to give ten directions. The latter group, for the most part, relied on contextual knowledge and on communication strategies, namely, avoidance (Skehan, p. 21). Requiring learners to give ten directions was a way to push them to speak; more specifically, it was a way to get them to use the target lexical items. However, although learners were told not to refer to the objects by number, they were still able to exploit the context; in other words, in giving the direction, learners were compelled to describe the object. Skehan argues that language use, either through comprehension or production, does not lead to change (p. 40). In the present study, the high comprehension results coupled with the low vocabulary acquisition scores of word recognition and production seem to indicate that the pressures of on-line processing – carrying out ten directions and giving ten directions – did not allow the learners to notice form – the ten lexical items.

Also consistent with the limited-capacity notion is Foster and Skehan's (1996) research on the effects of planning time and task performance. Their participants

performed three tasks: a personal information exchange task, a narration, and a decision-making task. Furthermore, the three groups that had to perform these different tasks, were given different planning times: Group 1 had no planning time, Group 2 had ten minutes unguided time and Group 3 had ten minutes guided planning time. The researchers measured the participants' fluency – operationalized as the number of pauses and total silence, accuracy – calculation of error-free clauses, and complexity – the amount of subordination and internal structuring of speech (pp. 304-305).

The results of their study show that the group that was not given time to plan had the least fluent speech in all three tasks. With regard to accuracy, the two groups that were given planning time had more accurate speech than the no planning group, but the unguided planning group had more accurate speech than the guided one in the three tasks. Finally, with regard to complexity, the planning-condition groups produced more subordination than the no planning group, and in turn, the guided-planning group produced more subordination than the unguided planning group. Also, the most complex language was produced in the narrative and decision-making tasks (p. 70). In their detailed analyses of the data, Foster and Skehan demonstrate that there are trade-off effects among learners' goals of fluency, accuracy, and complexity. They conclude that because learners are limited-capacity information processors, when the limited-capacity system allocates attention to one goal the others automatically suffer (p. 318).

In a nutshell, Foster and Skehan's (1996) research would indicate that, as a result of an absence of planning time as well as the rigorous one-minute limitation, learners in the present study were heavily taxed. In other words, a trade-off effect between (1) form – the names of the ten vocabulary items; and (2) meaning – gist of the ten vocabulary items – was bound to happen in light of the cognitive burden of the task. In fact, the results show

that, to keep up with the demands of the task, learners across the three groups gave priority to meaning, and, as a result, attention to form was penalized. Before moving on to the next subsection, three other variables deserve to be mentioned, albeit briefly: the modality used in the task, the test that was employed, and the order of the tests.

As regards the first variable, learners were solely exposed to spoken vocabulary, and using this modality may have rendered the task more difficult; that is to say, oral input, as opposed to written input, is ephemeral (N. Ellis, 1994). The second variable concerns the recall test that was applied. Whereas multiple-choice tests give the learners a 25% chance of getting the right choice, recall tests, the type used in the present study, require learners to retrieve the word from memory; thus, leaving the learner either with a correct or an incorrect choice. The last variable refers to the fact that in the present study, the production test always preceded the recognition test. This measure gave the learners no opportunity to be affected by the recognition test. To sum up, the demands placed upon the learners in the three groups were much too great to reveal the effects of the input and output conditions.

4.2.2. The intrinsic properties of words

The literature on vocabulary acquisition identifies intrinsic properties as having an effect on the ease with which words are learned (R. Ellis, 1994; Ellis & Beaton, 1993a; and Nation, 1982; among others). In this subsection only the intrinsic properties that appear to have caused difficulties to the participants will be heeded (see subsection 2.1.3 for a detailed review of these properties). These intrinsic properties are: orthography, length of word, phonotactic regularity, and phonology.

As mentioned in the previous subsection, learners were exposed to spoken vocabulary and thus did not have access to the words' orthography. Using this modality did not afford the learners the opportunity to make the 'regressive eye-movements' that written input would have permitted (N. Ellis, 1994). To be specific, the written form would have allowed them to "study the context, to form hypotheses at leisure and cross validate them, to have time to problem solve about meanings" (N. Ellis, p. 219). Although the experimental environment stipulated a rigid time limitation, the written mode would have perhaps allowed the learners to process the input differently. The following quote contrasts quite effectively the written with the oral modality: "The word is frozen in time on the page, whereas in speech it passes ephemerally" (p. 219). In brief, it is hypothesized that spoken vocabulary caused difficulties for all the learners.

Tables 6 and 7 show the vocabulary recognition and production test results for individual words and participants who recognized and produced them on the two posttests.

Table 6. Production test results for individual words and participants who produced them

		Pot	Pitcher	Rolling pin	Jar	Tongs	Range	Strainer	Ladle	Colander	Skillet
Input-Only Group	P1	1,10*			1,2,5,9,10		10				
	P2	1,10			10		10				
Input-Interaction Group	P1	9			3,5	2,5,10	3,10				
	P2	9			3,5	5	3				
Input-Output Group	P1	2,3,4,6,7		10	6,7,9,10		8,9	6			
	P2	2,3,4,6,7		9,10	3,6,7,9,10		8				

P1 = immediate production test
P2 = delayed production test

*The numbers identify the participants in each group who produced the target word. For instance, participants 1 and 10 in the input-only group produced the word *pot* on both production tests.

Table 7. Recognition test results for individual words and participants who recognized them

		Pot	Pitcher	Rolling Pin	Jar	Tongs	Range	Strainer	Ladle	Colander	Skillet
Input-Only Group	**R1**	1,2,7,9,10*	10	1,2,3,4,5,6,7,8,9,10	1,3,5,9,10	5	5,10	1,4			
	R2	1,5,9		1,2,3,4,5,6,7,8,9,10	10	3,7	5,10		3		
Input-Interaction Group	**R1**	5	3	1,2,3,5,6,7,8,9,10	3,5	2,3,5,6,7,10	3,4,6,9,10				
	R2			1,2,3,4,5,6,7,8,10	5	2,3,5,7,10	3,4,6			10	
Input-Output Group	**R1**	2,3,6,7,10	3,9	1,2,3,4,5,6,8,9,10	7,9,10	6	4,8,9	2,3,6		3,6	10
	R2	2,6		1,2,3,4,5,6,8,9,10	6,7,9,10	4,6,8,10	9	6,10		1,2,3,6,8	10

R1 = immediate recognition test
R2 = delayed recognition test
*The numbers identify the participants in each group who recalled the target word. For instance, participants 1,2,3,4,5,6,7,8,9, and 10 in the input-only group recalled the word *rolling pin* on both recognition tests.

The data, as shown in both tables, bear out the prediction that the length of the words affects their learning (R. Ellis, 1994; N. Ellis, 1994; Ellis & Beaton, 1993a). Recall that the present study used four monosyllabic words: *pot*, *jar*, *tongs*, and *range*; and six polysyllabic[14] words: *pitcher*, *rolling pin*, *strainer*, *ladle*, *colander*, and *skillet*. The data in Table 6 show that the polysyllabic words were difficult to produce on both posttests. These words, with the exception of *rolling pin*, were also difficult to recognize on both posttests as shown in Table 7. It is interesting to note, however, that some participants in the input-output group were able to receptively recall the polysyllabic words *strainer* and *colander* (see section 4.3 for an explanation). In the main, however, the polysyllabic words (with the exception of *rolling pin* in the receptive mode) were difficult to learn.

The monosyllabic words were relatively easier to learn than the polysyllabic words (again, see section 4.3 for explanation). Nevertheless, they did cause difficulties for the

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[14] Although the Cambridge International Dictionary of English refers to polysyllabic words as those containing three or more syllables (p. 1093), Richard, Plat, & Weber (1995) refer to polysyllabic words as those containing more than one syllable (p. 223). For the purpose of the present study, polysyllabic will follow the definition given by the latter scholars.

learners. For example, most of the learners confused the words *pot* and *jar* because they resemble the Portuguese words "pote" and "jarra". Also, the words *tongs* and *range* end in two final clusters with nasal plus sibilant (/nz/ and /ndz/ respectively) and these features may have caused pronunciation difficulties. All in all, it is highly likely that the length of the words "entail[ed] remembering more information and as a consequence, there [was] more room for error" (Ellis and Beaton, 1993a, p. 568).

Also, Ellis and Beaton (1993a) claim that "[t]he pronounceableness of a word is determined not only by its phonemes and their articulatory features, but also by their position in a spoken word" (p. 562). They refer to this intrinsic word property as phonotactic regularity. It is worth noting that the polysyllabic words which caused learning difficulties, according to Ellis and Beaton's definition, lack phonotactic regularity; that is, *strainer*, *ladle*, *colander*, and *skillet* were bound to be problematic because they are not in accord with Portuguese or Spanish phonotactic rules. For instance, the lack of a vowel before syllabic /l/ in *ladle*, before the /sk/ in *skillet* and the /str/ in *strainer*, and probably the stress in *colander*, which falls on the first syllable, caused pronunciation difficulties, and as a consequence, were difficult to learn. Ellis and Beaton cite several researchers (Rodgers, 1969; Faust & Anderson, 1967; and Seibert, 1927) to show that a way to counter pronunciation difficulties with L2 words is to have learners practice articulating these new sounds (p. 562). However, practicing the words would entail an explicit approach to learning, and the participants in the present study were exposed to an incidental learning task. Thus, in light of this difference, it is hardly surprising that the participants in the present study failed to subsequently recall most of the polysyllabic words. The subsection that follows will offer an account of the incidental approach to learning.

4.2.3. Incidental versus intentional learning

An additional factor that caused difficulties is the learning environment in which the participants were asked to perform. The task, whose primary goal consisted of carrying out ten directions, was composed of two secondary, but no less important, goals: first, participants had to choose the target item from among fifteen pictures representing kitchen objects – ten target items and five distractors; and secondly, they had to locate the place in the kitchen where the object had to be placed. In other words, the learning from this task is best characterized as incidental because the learning of the target items was a by-product of doing something else, namely carrying out the ten directions (Hatch & Brown, 1995, p. 368).

Claiming that the task entailed learning incidentally does not mean that the learning was completely without attention (Schmidt, 1990), but it does mean that the learners' attention was focused on meeting the primary goal – carrying out ten directions under the conditions mentioned in the previous subsections. In this sense, noticing the names of the lexical items would occur if the primary goal had not used up all the attentional resources (Barsalou, 1992, pp. 79-80). While it is not being argued that incidental learning is completely inefficient, embracing this learning approach has its disadvantages.

Scholars such as Sökmen (1997) and Nation (2001) posit that learning from context is a slow process. In light of this statement, it is hardly surprising that the majority of the participants in the present study were unable to productively and receptively recall the ten lexical items on both posttests. The learners' chances of vocabulary acquisition would perhaps increase if they were exposed to the words for a longer time. The conditions, however, were too rigid. Nation reiterates that "it is important to distinguish working out the meaning of a word from context, and remembering the meaning of a word worked out

from context" (p. 236). Sökmen, in this respect, points out a weakness of incidental learning. To be precise, she argues that "[e]ven if a student is exposed to a word in 'pregnant' contexts, those rich with clues, acquisition does not automatically result the first time" (p. 238). She goes on to assert that "guess[ing] the meaning of an unfamiliar word is not necessarily what it takes to store it in one's memory, perhaps because the most immediate need – comprehension – has been met" (p. 238). From these statements, it logically follows that learners in the present study were unable to recall the ten vocabulary items because the nature of the task did not allow for any cumulative learning to take place.

Nonetheless, the cumulative nature that characterizes incidental learning is only one piece of the conundrum; that is, the cognitive load of the task and the intrinsic properties of words, which were carefully outlined above, also caused learning difficulties. The data from the present study seem to indicate that no matter how advantageous premodified input, interactionally modified input, and pushed output might be, the limited-capacity information processing system was strained by the time pressure. In other words, giving learners one minute to process each direction outweighed the potential benefits of the different input-and-output conditions.

4.3. The acquisition account

The aim of this section is to provide an explanation as to why some acquisition, albeit low, did take place. First, the section includes which words were less difficult to recall as well as a breakdown of how many participants from each group were able to subsequently recognize and produce the words are provided. Secondly, I attempt to offer an account as to why the input-only and input-output groups had an advantage over the

input-interaction group. Finally, the fact that word production is more difficult than word recognition will be underscored throughout the section.

The words that were less difficult for the three groups were *rolling pin*, *pot*, *jar*, *tongs* and *range*. It is interesting to note that within these small gains, production scores tended to be lower than recognition scores. For example, the word *rolling pin*, which by far was the easiest word to be receptively recalled (the ten participants in the input-only group recalled the word on both tests; nine participants each from the input-interaction and input-output groups recalled the word on both tests), was produced by only one person on the immediate test and by two people on the delayed test; these participants were from the input-output group.

The word *pot* was produced by five people from the input-output group on both tests; only two people from the input-only group produced the word on both tests, and only one person from the input-interaction group produced the word on both the immediate and delayed tests. On the recognition posttests, *pot* was recalled by five people from the input-only group on the immediate test and by three on the delayed test; in the input-interaction group, only one person recalled it and no one recalled it on the delayed test; five people from the input-output group recalled *pot* on the immediate test and two people recalled it on the delayed test.

The word *jar* was produced by five people in the input-only group on the immediate test and by only one person on the delayed test; in the input-interaction group, two people produced the word on the immediate and delayed tests; in the input-output group four people produced the word on the immediate test and five on the delayed test. On the recognition posttests, *jar* was recalled by five people from the input-only group on the immediate test, and by only one on the delayed test; in the input-interaction group two

people recalled the word on the immediate test and only one person on the delayed test; in the input-output group three people recalled the word on the immediate test and four people on the delayed test.

The input-interaction group did slightly better in recalling the word *tongs* than the two other groups. For example, four people produced it on the immediate test and one on the delayed test; on the recognition test, six people recalled it on the immediate test and five on the delayed test; the input-only and the input-output groups did not subsequently produce this word, but one person from the input-only group subsequently recognized it on the immediate test and two on the delayed test; in the input-output group, one person recalled the word *tongs* on the immediate test and four on the delayed test.

The last word, *range*, was productively recalled by one person in the input-only group on the immediate and delayed tests; in the input-interaction group two people produced it on the immediate test and one on the delayed test; in the input-output group two people produced it on the immediate test and one on the delayed test. On the recognition tests, two people from the input-only group recalled the word on the immediate and delayed tests; in the input-interaction group five people recalled the word on the immediate test and three on the delayed test; finally, in the input-output group three people recalled the word on the immediate test, and one on the delayed test.

These results reveal that, in comparison with the input-only and input-output groups, the input-interaction group recalled less words. As shown in Table 5, this group faced a more cognitively-loaded task – engaging in listening and in 'limited' production – than the input-only group, but a less demanding task than the input-output group. A plausible explanation for their smaller gain in acquisition lies in the way these participants

had to process the directions, namely by listening and having to produce, although in a constrained way, and as a result little time was left to store the names of the target items.

Exceptions to this are the lexical items *tongs* and *range*. With regard to the former, three students recalled it productively and six recalled it receptively on the immediate test. With regard to the latter, two students recalled it productively and five recall it receptively on the immediate test. The most plausible explanation is that due to the time pressure, participants' bypassed the words *pot* and *jar* and chose to concentrate on the other monosyllabic words, *tongs* and *range*. Furthermore, *tongs* resembles the pronunciation of *tongue* and *range* has other meanings, mainly distance. That is to say, these characteristics might have made the words more salient while the monosyllabic words *pot* and *jar*, which are false cognates, might have been unregistered due to the time pressure.

An additional explanation is the efficiency of the specific students who for the most part acquired the words *tongs* and *range*. Research in cognitive science identifies organization as a major factor in gaining mental representations (Barsalou, 1992, p. 125). Whereas the majority of the students were overwhelmed by the amount of input and the time constraint, these students were better organizers for tackling the task. Example 1 is provided to illustrate the difficulty of the task:

Example 1:
R (researcher): Put the pot in the sink.
S (student): What this pot means?
R: A pot is a large container used in the preparations of soups
S: Just preparation? Not when in…
R: To prepare soups to cook soups.
S: And you put this thing in… the fire in fogão?
R: Sure, you would use it to cook soup and you would place it on the stove.
S: Put it where?
R: In the sink
S: In the sink? … You tell me when the time over?
R: It's over!

There were times when students were unable to understand the directions and although the majority of them attempted to negotiate meaning, the time limitation proved to be too rigid to successfully answer the students' clarification requests. The following example shows how few of the students were able to handle the task.

> Example 2:
> R: Place the tongs on the dish drainer.
> S: Tongs?
> R: The tongs.
> S: And what it is used for?
> R: They are used for picking up objects and picking up and holding objects
> S: And what objects?
> R: For example you can pick up ice…cubes
> S: Ah yeah… what is its name?
> R: Tongs
> S: Tongs
> R: Tongs
> S: I have to put it in the dish drainer?

This particular student handled the task by focusing on the different secondary goals: he focused on arriving at the meaning of the target item (*tongs*) in order to eliminate the other fourteen objects – ten target items and five distractors; once he felt he understood the meaning of *tongs*, he concentrated on finding the location (dish drainer) on the kitchen matrix to place the number that represented the target item.

One conceivable reason why receptive recall took place in the input-only group is this group's having been exposed to a less cognitively demanding task. Recall that participants were engaged in listening only; while listening is not a passive skill (Morley, 2001), it is acknowledged, for unclear reasons, as being less demanding than speaking (Nation, 2001, p. 28). Having the directions modified *a priori* decreased the load of the task, namely by exempting them from having to speak. In light of this fact, it is reasonable to assume that participants exploited the first-ten minute session to engage in processing the information and the second ten-minute session to attempt to store the target items.

In the first ten-minute session (comprehension of the directions was measured in this session), the input-output and the input-interaction groups performed exactly the same task. These two groups had a more demanding second task than the input-only group and the comprehension scores, which were highest for the input-only group, corroborate this fact. However, the input-output group's load was made more demanding by having them give ten directions on-line. While this measure taxed the capacity of the participants, some of them benefited from the feedback they received from the instructor - myself. It was at the moment when some of the students were giving the direction for *pot* that they realized that the picture representing the word *jar* was not compatible with their assumption. In other words, receiving feedback allowed the learners to see the 'mismatch' problem (Klein, 1986; cited in Skehan, 1996). To illustrate the 'mismatch' problem, examples 3, 4 and 5 are provided. Example 3 shows the participant giving me the first direction. I ask the participant for a definition (line 02) and I realize that she confused the word *pot* with *jar*. However, as she does not engage in meaning negotiation, I only provide her with negative evidence (line 06).

> Example 3:
> S: Could you put the *pot* in the trashcan?
> R: What is a pot?
> S: A pot is something you save food
> R: To save food?
> S: To save mayonnaise
> R: That's a pot?
> S: I think so!

Example 4 is provided to illustrate that the participant in fact did confuse the word *pot*, which sounds like the Portuguese word "pote", with the picture representing a *jar*. Furthermore, she confused the word *jar*, which is a false cognate of the Portuguese word "jarra", with the word *pitcher*.

Example 4:
S: Put the *jar* in the refrigerator
R: What is a jar?
S: A jar is a place where you usually put juice or water
R: Put it in the refrigerator?
S: Yes.

Example 5 illustrates the 'mismatch' problem. Here the participant is giving me the direction for the picture representing the word *pot* but is unaware that the word for "panela" (Portuguese word for *pot*) is *pot* and decides to call it a 'saucepan but bigger' (line 01). After I provide explicit feedback (line 04), the participant placed emphasis on the verb *is* (line 05), as if she confirmed some sort of hypothesis. Here she realized that the word *pot* did not represent the picture illustrating a *jar*.

Example5:
S: It's like a saucepan but bigger
R: Ok?
S: I use it to cook rice and beans
R: Oh, the pot!
S: It *is* the *pot* so put the *pot* on top of the stove

By far, the easiest word to recall for the three groups was *rolling pin*. A plausible explanation is the prior knowledge learners brought to the task. More specifically, the first word (*rolling*) of this compound word (*rolling pin*) is a form of the verb, to roll, which sounds similar to the word in Portuguese, "rolo". In addition, the English and Portuguese words share the same initial three letters (*rol*). In light of this resemblance, it is reasonable to surmise that upon hearing the instructor produce *rolling pin*, the word "rolo" was activated. In the main, however, the results show that the slight acquisition that took place manifested itself primarily at the level of recognition. The following two subsections attempt to shed light on why productive knowledge may be more difficult than receptive knowledge.

4.3.1. Acquisition at the level of production

Swain (1985, 1995) argues that the processes involved in output force learners "to move from semantic processing [believed to predominate in comprehending language] to syntactic processing" (p. 249). In other words, whereas listeners are believed to be engaged in 'decoding', speakers are assumed to be actively engaged in 'code breaking' (Cook, 1991; cited in de la Fuente, 2002). To buttress her argument, Swain brings to the fore evidence from the immersion classrooms in Canada where children who have been exposed to the target language perform at near-native levels in the receptive skills – reading and listening – but not in the productive skills – speaking and writing (Swain & Lapkin, 1995). In other words, Swain believes that in order to achieve native-like competence, students must engage in production, in addition to comprehension.

The present study investigated this construct – 'pushed' output – and found that learners in the input-output group, especially in the second ten-minute session, were not successful at moving to syntactic processing under the conditions to which they were exposed. Few of them engaged in meaning negotiation and the factor that helped them pinpoint a 'mismatch' problem was the negative or explicit feedback provided by the instructor. In this sense, then, the results present an answer to Skehan's question (Skehan, 1998, p. 19) as to whether output favors *language learning* or *language use*. The conditions in which the learners from the input-output group had to perform resembled real time production and it is my claim that these conditions favored language use rather than language learning.

To shed light on the complexity of speaking production, Levelt's (1989) speech production model will be reviewed. Speaking is rendered a complex cognitive skill because the skill is composed of other sub-skills (McLaughlin, 1987). In other words,

before carrying out the higher-order skill, speaking, other lower-order skills must be completed (McLaughlin, 1987). To reveal these lower-order skills, or components underlying production, Levelt proposes a processing system which consists of a conceptualizer, a formulator, a mental lexicon, and an articulator.
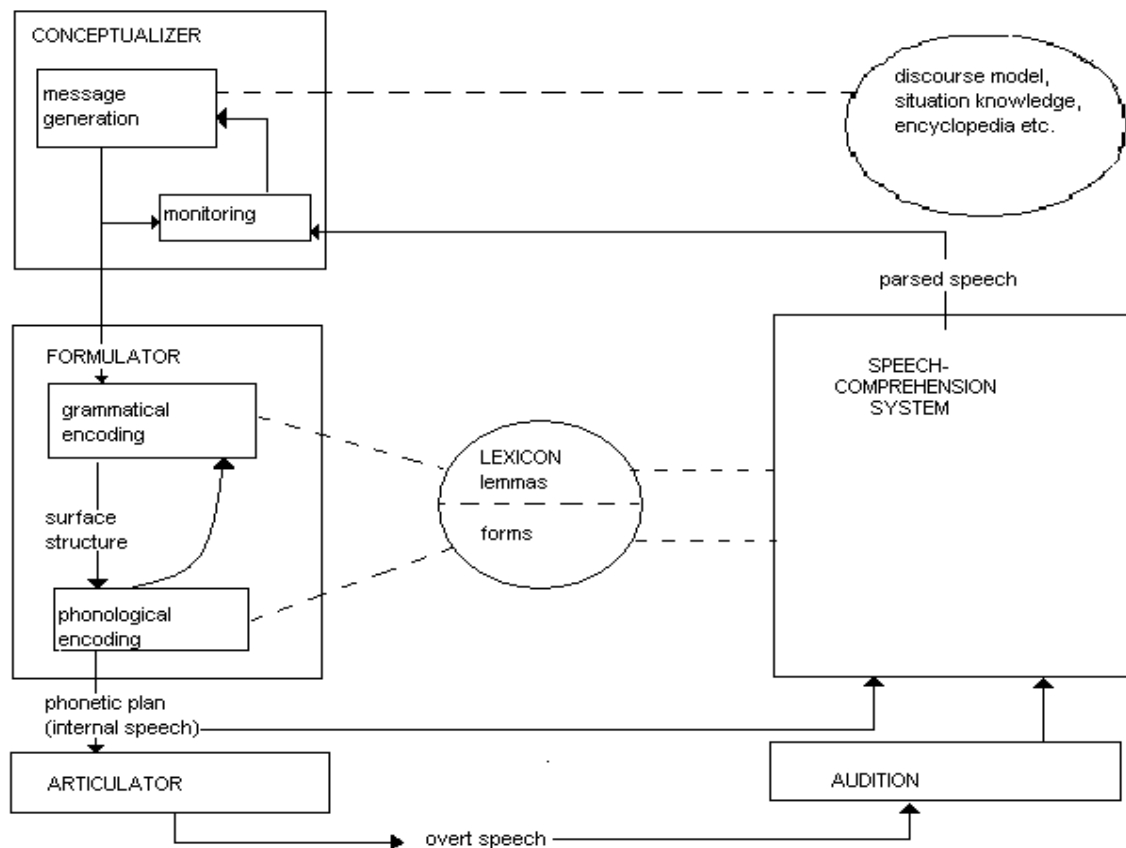

Figure 1. Levelt's model of speech production (1989, p. 9)

The first requirement to engage this processing system is to come up with a communicative intention. This intention takes place within the conceptualizer, which is subserved by two devices responsible for message generation and monitoring. Furthermore, macro-and micro-planning aid in elaborating the message, which Levelt

defines as "a highly structured package of information" (p. 5). During the former type of planning, "the speaker selects and molds information in such a way that its expression will be an appropriate means for conveying the intention. In this phase the speaker spells out his communicative intention and marshals the appropriate information whose expression will reveal the intention to the addressee" (p. 5). During the latter type of planning, "the speaker brings all this information into perspective, marking the information status of referents as "given" or "new" for the addressee, assigning topic and focus, and so on." (p. 5). The processing that unfolds in the conceptualizer does so at the conceptual level and the output it produces - the preverbal message - becomes the input to the formulator. It is here that the conceptual message begins to be encoded at the linguistic level.

To do so, the formulator engages in two different processes: grammatical and phonological encoding. However, to carry out these processes, these encoding mechanisms rely on the mental lexicon, which is composed of lemmas and forms. The former include nonphonological information, namely semantic, syntactic, and at times, morphological information; the latter include internal (morphological and phonological) information about each lemma. Thus, the grammatical encoding mechanism depends on the lemmas to help 'fill out' the different spaces that compose the syntactic plan. Levelt refers to the result of such processing as a surface structure.

The surface structure is temporarily stored in a syntactic buffer to allow the phonological encoding mechanism to create a phonetic plan for the contents of this structure. Once again, this mechanism draws on the lexicon to retrieve the forms pertaining to the lemmas in the surface structure. The outcome of this processing is a phonetic plan. The phonetic plan "is not yet overt speech; it is an internal representation of how the planned utterance should be articulated – a program for articulation" (p. 12). The phonetic

plan becomes input for the articulator, which is composed of "the musculature of the respiratory, the laryngeal, and the supralaryngeal systems," (p. 12). As internal speech continues to be generated, it is stored in the articulatory buffer, which is eventually executed by the articulator and its result is overt speech.

The different components of the system are autonomous and this "highly automatic reflex-like" characteristic allows the components to work in parallel (p. 2). Otherwise, as Levelt points out, uninterrupted fluent speech would not be possible (p. 2). Additionally, two types of knowledge and two types of processing, which are well documented in the cognitive psychology literature (LaBerge and Samuels, 1974; Posner and Snyder, 1975; Schneider and Shiffrin, 1977; and Flores d'Arcais, 1987a; all cited in Levelt, 1989, p. 20), are relevant to the system: procedural and declarative knowledge and controlled and automatic processing. In Levelt's model, the rectangles, which include the conceptualizer, the formulator and the articulator, represent procedural knowledge; these are processing components. The circle and ellipse, which include the mental lexicon and discourse record, include declarative knowledge. Procedural knowledge is defined as 'knowing how' and declarative knowledge as 'knowing what.' (McLaughlin, 1987). With regard to processes, controlled processes are believed to demand attentional resources and one can attend to only a few things at a time; automatic processes, on the other hand, are "executed without intention or conscious awareness" (p. 20).

Levelt posits that the processes that take place in the conceptualizer are controlled (p. 21). Here, the information that one attends to during the message planning is held in working memory (p. 10); however, the rest of the components engage in automatic processing (p. 21). Although this model depicts the processes believed to underlie L1 production, it sheds light on the intricacies necessary to reach the higher-order skill of L2

speaking. Thus, in light of these intricacies, it is hardly surprising that the majority of the learners in this study were unable to subsequently produce L2 words. In fact, from this model, it becomes clear that speaking is a complex skill in and of itself, let alone speaking to keep up with the demands of using newly learned words in real time.

In light of the intricacies of the model, and bearing in mind that, at least for the participants in the present study, the L2 mental lexicon has not been built up throughout a lifetime, it is not far-fetched to assume that if conceiving of an intention uses up attentional resources in an L1, in an L2 the process is as or more demanding than in an L1. Along the same lines, Fortkamp (2000) suggests that,

> …the L2 mental lexicon has fewer words available and, for some of these words, syntactic information may not be fully specified (Poulisse, 1999). It is also quite likely, as suggested by Poulisse (p. 56), that the relationship between the lexical entries of an L2 mental lexicon is not as fully developed as in the L1 lexicon (Levelt, 1989). The L2 speaker, thus, has less linguistic information on which to draw when encoding a message in the L2 (p. 162).

In sum, the purpose for outlining Levelt's (1989) L1 speech production model is to show that speaking is a complex task in and of itself. Thus, to postulate that output is the driving force behind the L2 acquisition process (Swain, 1985, 1995) is misleading. In light of the results from the present study, simply 'pushing' L2 learners to speak does not result in vocabulary acquisition. Skehan (1998) argues that attention to form is essential to cause a change in the L2 learner's interlanguage (Skehan, 1998). However, from the present study, it seems that the one-minute limitation to complete the task was not an efficient way to contrive attention towards form. This does not mean that attention to meaning is less important. In fact, it seems useless to learn the form of a word and yet be unable to know its meaning. Thus, as Skehan argues that in real-time language one resorts to the exemplar-based mode, or to the meaning of messages, it seems reasonable to argue that L2 learners

must be exposed to favorable conditions in order to automatize access to both the meaning and form of words so that when L2 learners are required to meet the demands of real-time language processing, they can access words meaningfully and accurately.

4.3.2. Acquisition at the level of recognition

Although accounts of the mechanisms underlying language comprehension are less comprehensive than those of speech production (Barsalou, 1992, p. 263), research on input has shed some light on how language gets processed. Adopting an information-processing paradigm, Chaudron (1985) explains that not all input is processed. More specifically, he makes a distinction between input and intake. Whereas input constitutes the language available for going in, *intake* is 'what goes in' (Corder, 1967; cited in Chaudron, 1985, p. 2). In other words, the transition from input to intake "identifies the learner as an active agent in acquiring the target language" (Chaudron, 1985, p.2). Moreover, Chaudron defines intake as:

> a complex phenomenon of information processing that involves several stages, roughly characterized as (1) the initial stage of perception of input, (2) the subsequent stages of recoding and encoding of the semantic (communicated) information into long-term memory, and (3) the series of stages by which learners fully integrate and incorporate the linguistic information in input into their developing grammars (p. 2)

Furthermore, he identifies two aspects that determine what in the input may become intake. The first aspect is identified as the learner's current interlanguage and the second one to 'procedures, processes, and other psychological variables that make up the learner's cognitive apparatus" (p. 2).

The account of language comprehension processing that Chaudron puts forward seems to indicate that processing of initial intake is not a passive skill. Nonetheless, it is

not uncommon in the research on vocabulary acquisition to find productive learning equated with 'active' learning, and receptive learning with 'passive' learning. Several researchers (Morley, 2001; Teichroew, 1982, among others) have voiced their discontent with such a dichotomy.

Anderson and Lynch (1988; cited in Morley, 2001, p. 1) see listening as an active skill because learners are constantly giving interpretation to incoming speech. In fact, two processes involved in processing incoming speech are identified as *bottom-up* and *top-down* (Morley, 2001; Peterson, 2001). Whereas the former process refers to the information present in the data (i.e., sounds), the latter process refers to the previous knowledge the learner possesses (Richards, Platt, & Weber, 1985, p. 295). Although it is presumed that these processes continually interact (Peterson, 2001, p. 89), Chaudron argues that low-proficiency learners rely on "bottom-up, word-for-word processing" (p. 4).

As mentioned previously, while *active* and *passive* may not be the most adequate terms to describe productive and receptive vocabulary, an account must still be given of why in the present study receptive recall of L2 words was relatively easier than productive recall. Recall that the word *rolling pin* was subsequently recognized by almost all the participants on the immediate and delayed tests; the words *pot*, *jar*, *tongs*, and *range* are other words that were subsequently recognized. The *access* explanation provided by Ellis and Beaton (1993b; cited in Nation, 2001) is a plausible account for this acquisition. The explanation posits that receptive recall (i.e., L2 to L1) is easier than productive recall (i.e., L1 to L2) in the early stages of language learning because there is only "one simple link to its first language translation" (Ellis and Beaton, 1993b; cited in Nation, 2001, p. 29). The productive direction, on the other hand, has "many competing associations and thus productive recall is more difficult than receptive because there are many competing paths to

choose from, and the ones within the L1 lexical system are likely to be stronger" (Nation, 2001, p. 29).

An additional explanation lies in the type of process used to arrive at meaning of the lexical items. Recall that the one-minute limitation added to the cognitive load of the task; bearing this in mind, it is highly likely that learners were not able to rely only on bottom-up processing, as Chaudron has suggested. A more realistic explanation is that learners focused on particular cues (i.e., certain words) from the sentence and then drew on their long-term memory, or on top-down processing, to arrive at meaning. Additionally, even if learners attended to the target items, the time limitation and the number of items to be learned – ten – may have taxed the learners' working memory (Barsalou, 1992, p. 92); there was simply too much information to be computed and stored in the temporary system.

In light of this evidence, productively recalling the target items was more difficult for the learners than receptively recalling them. While this evidence may corroborate Swain's (1985, 1995) argument that semantic processing [believed to predominate in comprehending language] may not force the learners to move to syntactic processing, a more reasonable explanation is that language production is simply a complex skill to master in a L2. Lastly, as Skehan (1998) pointed out, real time production may not favor the syntactic-mode but the exemplar-mode system.

CHAPTER 5

FINAL REMARKS

5.1. Concluding notes

The purpose of the present study was to investigate L2 vocabulary acquisition with regard to the input, interaction, and output hypotheses. In addition, the following research questions were posed: (1) What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' comprehension of directions containing new L2 words?; (2) What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' ability to subsequently recognize new L2 words?; and finally, (3) What are the relative effects of premodified input, interactionally modified input, and pushed output on L2 learners' ability to subsequently produce new L2 words? To answer the research questions, 30 EFL learners were placed in one of the following linguistic environments: *input-only*, *input-interaction*, and *input-output*. During the treatment the participants were given a handout which contained a matrix picture of a kitchen, fifteen numbered-objects illustrating the kitchen-related items – these were the ten target items as well as five distractor items –, and a set of locational expressions. The treatment was divided into two-ten minutes sessions: 1) the first ten-minute session required the participants to carry out ten directions, but the conditions varied for the three groups depending on the linguistic environment in which they were placed; 2) the second ten-minute session followed the same procedure as the first but the order of directions was changed; once again, the conditions varied for the participants depending on the linguistic environment in which they were placed. The treatment lasted 20 minutes and an immediate

productive and receptive recall vocabulary test followed. In addition, a second productive and receptive recall vocabulary test was administered one week after the treatment.

The results obtained in the present study were not clear-cut in terms of revealing which condition was more favorable to the acquisition of basic word meanings. As regards comprehension, the data indicate that the three condition groups – premodified input, interactionally modified input, and interactionally modified input with pushed output – were capable of attaining reasonable comprehension scores. With regard to subsequent production and recognition of L2 words, the scores were not as robust. To put it another way, none of the three conditions – premodified input, interactionally modified input, and interactionally modified input with pushed output – seem to have created a favorable environment to effect acquisition. For example, on the immediate receptive and productive recall tests, the three groups obtained fairly low scores. Furthermore, while the scores did not increase on the delayed test, only the group that was exposed to interactionally modified input with pushed output was able to maintain the fairly low score it had obtained on the immediate test.

It was concluded that learners in the three learning conditions were able to obtain sound comprehension scores due to the richness of contextual clues. That is, the directions that were given to the participants were rich in stative descriptive cues (e.g., properties of X such as size, shape, color) and functional descriptive cues (e.g., possible purposes of X, actions X can perform, or potential uses of X) which are believed to aid in the understanding of input (Sternberg, 1987, p. 92). It is interesting to note that the same redundancy which helps understand input is also believed to hinder learning (Coady, 1993, cited in R. Ellis, 1994, p. 2) because the richness of contextual cues may aid the learner in understanding meaning but at the same time it may also divert learners' attention from

form.   Nonetheless, this was not the explanation provided to account for the low acquisition scores. It was thought that a more sensible account of the acquisition scores lay in the cognitive load of the task, the intrinsic properties of the words utilized, and the nature of the learning involved. In short, in light of the account that was brought to the fore, more generalizable statements about which learning condition is more conducive to the acquisition of word meanings were deemed unfeasible.

5.2. Limitations of the Study and Suggestions for Further Research

The present research project faced four major limitations: (1) vocabulary knowledge, (2) visual sources/distractors, (3) sample size, and finally, (4) basic word meanings. The first two – vocabulary knowledge, and visual sources/distractors – will be discussed together as they are interrelated, followed by sample size and basic word meanings.

Nagy (1997) points out that "to infer the meaning of any particular word encountered in context, it is helpful to know the meanings of the words around it" (p. 79). During the data collection, many learners had difficulty in understanding the words (i.e., *strain*, *fry*, *dough*) provided to describe the meanings of the ten lexical items, and as a consequence, they relied on the context provided by the pictures. Five of these pictures were inserted as distractors. They were: *whisk*, *toaster*, *blender*, *grater*, and *cutting board*. However, these visual sources proved problematic because some of the clues given to define the lexical items could easily distract learners' attention from the target items. For instance, the word *skillet* was defined as a pan to fry eggs. Rather than concentrate on the clues given by the words *pan* and *fry*, some of the participants chose *whisk*, an object to beat eggs.

Additionally, the pictures representing the words *colander* (escorredor de massa) and *strainer* (peneira) proved problematic. That is, the two words have similar meanings in the sense that the function of these objects is to remove water from solid food such as spaghetti, or pulp from juice; both objects also have small holes. These similarities caused confusion for the majority of the students. In fact, one student mentioned that he uses the *strainer* to drain liquid from juice pulp and from spaghetti. In short, these visual sources added to the difficulty of the task. In view of this limitation, three suggestions can be made for further research: First, key items – the words around the target item which provide clues as to the meaning of the target word – should be taught to the participants before the treatment; otherwise, the likelihood of the target items being acquired will be diminished. Secondly, caution should be taken with the selection of distractors; that is, distractors that are semantically related to the target items should be avoided. Finally, careful selection of visual aids is needed to avoid possible difficulties.

The third limitation is the sample size. Although previous studies had more participants – Loschky (1994) had 41, Ellis et al. (1994) had 206, Ellis and He (1999) had 50, and de la Fuente (2002) had 32 - the present research project had 30 participants. In fact, participants in the present research project were recruited from two intermediate levels (Levels 7 and 8). Although I wanted the 30 participants to be from the same level, students' tight schedules did not allow them to partake in the experiment. In short, I am aware that recruiting participants is always a challenge, especially when they are not being paid. Nevertheless, future researchers should strive to have many participants in order to generalize results.

The fourth and final limitation is the narrow focus of the study; that is to say, only basic word meanings were investigated. It is thus difficult to generalize how the three

linguistic conditions – premodified input, interactionally modified input, and pushed output – would affect other aspects of a word, i.e., collocations and associations. Also, generalizations cannot be made regarding how verbs, adjectives, and adverbs are acquired since the lexical meanings that were tested were all concrete nouns. Despite these limitations, the present research project does have clear pedagogical implications.

5.3. Pedagogical implications

In view of the results obtained in the present study, two major pedagogical implications are suggested for the teaching of vocabulary. The first one refers to incidental learning, and the second one to false cognates.

Scholars claim that incidental learning is an incremental process and as a result, its benefits take place over time (Nagy, 1997; Nation, 2001, Sökmen, 1997, among others). Nagy (1997) in particular argues that second-language learners may benefit from incidental learning because they have a greater need to use context; that is, they encounter unfamiliar words at a greater rate than first-language learners (p. 76). However, if incidental learning is to take place over time, one must keep in mind that L2 learners, whether in an ESL or an EFL context, must have access to abundant input. In this sense, ESL learners may be at an advantage because they are exposed to input in the classroom and out of the classroom; that is, they may receive input from native speakers, magazines, radio, television, and so on. By having more access to input, ESL learners may have the opportunity to reap the benefits of incidental learning. Brazilian EFL learners, on the other hand, may not benefit from incidental learning so readily. In other words, at least for the participants in this study, main input comes from the classroom where learners meet twice a week for one hour and a half. It seems to me that three hours a week of input will not foster incidental learning

mainly because learners will lack the opportunities to have multiple encounters with words in different contexts. For instance, few of these learners have to speak the language outside the classroom and probably only those students who are highly motivated will read texts in English for pleasure. In light of this situation, it seems sensible to conclude that Brazilian EFL learners may benefit more from an intentional, mainly instructional, approach to learning vocabulary. For example, instructors could assign the reading of a novel throughout the semester. By reading a chapter a week, instructors could easily cover unknown vocabulary during the first ten minutes of the class. Moreover, semantic associations between the target word and its definition are needed in order to remember words over time (Brown & Perry, 1991). In short, EFL instructors should look for ways to optimize intentional vocabulary learning to compensate for the lack of naturalistic language which is crucial for incidental learning.

Although cognates may aid L2 learners to acquire vocabulary (Swan, 1997), false cognates may cause difficulties because they give misleading information. In the present study, I chose ten lexical items related to the kitchen because providing a context for the learners is claimed to aid incidental learning (Nagy, 1997). In choosing the words, a pretest containing 129 lexical items was given in order to choose ten items that were unfamiliar to the 30 participants. Two of these items were *jar* and *pot,* which resemble the Portuguese words "jarra" and "pote", respectively. In giving the directions to the participants, they had to choose a picture from among fifteen lexical items – ten target items and five distractors – which they thought matched the description. Among the fifteen pictures, one of them was *pitcher* and another one was *jar.* Thus, upon hearing the word *jar*, the majority of the participants choose the picture representing *pitcher,* which in Portuguese is "jarra", and upon hearing the word *pot*, the majority of them chose the picture representing *jar* which in

Portuguese is "pote". Thus, an incidental learning approach was not beneficial for these learners. To put it differently, the data from the present study indicate that learning false cognates may require a more explicit approach to learning. As a result, EFL instructors might find the systematic study of cognates, especially false cognates, useful in the classroom (Swan, 1997). The challenge is thus to develop appropriate tools or teaching materials in order to successfully integrate their study into the EFL classroom.

To sum up, the objective of the present study was to investigate the effects of three linguistic environments – premodified input, interactionally modified input, and pushed output – on the comprehension and acquisition of ten L2 lexical items. Although the data from the experiment did not favor a particular linguistic environment, it did reveal that task load, intrinsic properties of words, and type of learning affect the acquisition process. Thus, I hope that the findings better inform 1) Brazilian EFL instructors on what may be possible difficulties in teaching L2 vocabulary, and 2) Brazilian EFL students on taking a more active role in the learning of vocabulary, especially when the chances to learn incidentally are slim. In other words, learners need to look for ways outside the classroom to encounter words in different contexts in order to learn the multiple meanings of words. Notwithstanding the limited naturalistic input outside the classroom, EFL learners could benefit from (1) watching movies without subtitles, (2) reading English-language magazines (e.g, *Speak Up*, *Times*, *Newsweek*), and, (3) attending free conversation classes on campus.

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APPENDIX A: The pretest

Instruções: Para cada palavra abaixo escreva a <u>definição</u> em **inglês** ou **português**, um <u>sinônimo</u> em **inglês**, ou a <u>tradução</u> em **português**. Não se preocupe com aquelas palavras que você não conheçe.

01. hamper:
02. turtle:
03. cupboard:
04. seesaw:
05. kitten:
06. sink:
07. grater:
08. towel rack:
09. ladle:
10. cabinet:
11. mirror:
12. skillet:
13. plum:
14. faucet:
15. umbrella:
16. counter:
17. colander:
18. cooler:
19. frog:
20. horse
21. dishwasher:
22. tongs:
23. hamburger:
24. toad:
25. pot holder:
26. broiler:
27. burner:
28. toothbrush:
29. papayas:
30. pitcher:
31. sponge:
32. drawer:
33. mug:
34. stove:
35. cow:
36. pillow:
37. fork:
38. knife:
39. strainer:
40. soap:
41. toaster:

42. spatula:
43. crucible:
44. parsley:
45. bowl:
46. jeans:
47. overalls:
48. blender:
49. broom:
50. lifeguard:
51. coffeemaker:
52. eggplant:
53. garlic:
54. saucer:
55. chicken:
56. oven:
57. pan:
58. pot:
59. shrimp:
60. can opener:
61. sand:
62. lid:
63. steamer:
64. shorts:
65. mixing bowl:
66. frying pan:
67. grapes:
68. pizza:
69. saucepan:
70. whisk:
71. eggs:
72. tablespoon:
73. freezer:
74. fire:
75. sofa:
76. wall:
77. cutting board:
78. baking sheet:
79. plant:
80. bed:
81. dress:
82. garlic press:
83. peas:
84. vegetable peeler:
85. onions:
86. salmon:
87. shelf:
88. refrigerator:

089. pineapple:
090. toilet:
091. rolling pin:
092. glass:
093. jar:
094. lettuce:
095. mop:
096. plate:
097. mat:
098. pantry:
099. toaster oven:
100. green:
101. avocado:
102. dish soap:
103. bread box:
104. salad:
105. soup:
106. electric mixer:
107. teakettle:
108. quiche:
109. poached eggs:
110. spoon:
111. garbage disposal:
112. dish drainer:
113. cheerleader:
114. lawyer:
115. vanilla:
116. food processor:
117. egg beater:
118. peach:
119. plastic container:
120. jury:
121. persecutor:
122. cup:
123. garbage:
124. teaspoon:
125. witness:
126. stovetop:
127. range:
128. defendant:
129. paper towels:

APPENDIX B: Productive Posttests

Part 1: Productive Vocabulary Knowledge Scale

1. Eu nunca falei essa palavra em inglês para essa figura. Eu não sei a palavra.

2. Eu já falei essa palavra antes, mas agora não me lembro.

3. Eu acho que é _____ em inglês.

4. Eu sei que é _____ em inglês.

<u>First Posttest</u>

<u>Second Posttest</u>

APPENDIX C: Receptive Posttests

Part 2: Receptive Vocabulary Knowledge Scale

1. Eu não me lembro ter escutado essa palavra antes.

2. Eu já ouvi essa palavra antes, mas não sei o seu significado.

3. Eu já ouvi essa palavra antes e acho que significa _____ (dê a tradução, ou seja, diga qual a palavra em português).

4. Eu sei o que essa palavra significa. Ela significa _____ (dê a tradução, ou seja, diga qual a palavra em português).

First Posttest	**Second Posttest**
1. ladle	1. jar
2. pitcher	2. tongs
3. range	3. skillet
4. strainer	4. colander
5. pot	5. rolling pin
6. rolling pin	6. pot
7. colander	7. strainer
8. skillet	8. range
9. tongs	9. pitcher
10. jar	10. ladle

APPENDIX D: Handout 1

Locational Expressions
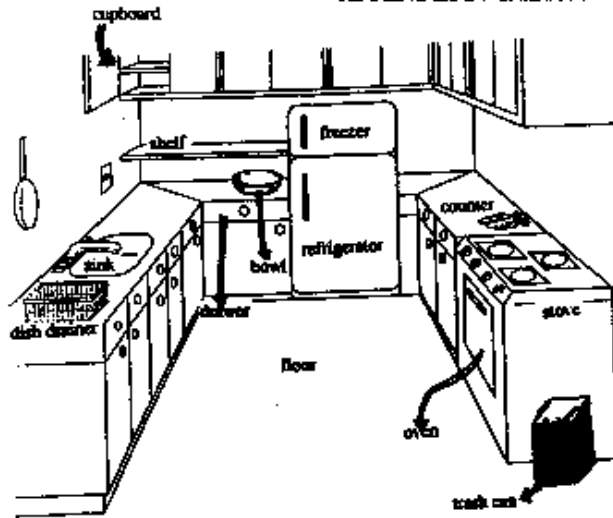
A is under B

B is on top of A

B is between A and C

C is next to B, on the right

A is next to B, on the left

B is behind A

A is in front of B

cupboard

shelf

freezer

refrigerator

sink

dish drainer

drawer

bowl

floor

counter

stove

oven

trash can

saucepan

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

APPENDIX E: Premodified directions

First ten-minute session:

1. Put the **pot** in the sink. A pot is a big container that you put over a fire when you want to cook large quantities of food. For example, you use a pot to prepare soups. You fill the pot with food and you put it on the fire and it will just cook for a long time. The pot is made out of metal and it looks like a deep bowl. Please put the pot in the sink.

2. Put the **pitcher** in the refrigerator. A pitcher is a container made out of plastic or glass, it has a handle and a spout or lip. You use a pitcher to hold and pour liquids such as water, juice or beer. Put the **pitcher** in the refrigerator.

3. The **rolling pin** belongs on the counter, on the left side of the bowl. A rolling pin is used in the preparation of pizzas. For example, you will need a rolling pin to make the dough round and flat; you will take the rolling pin to roll over the dough. You want to put the rolling pin on the counter, on the left side of the bowl.

4. Place the **jar** in the freezer. A jar is a container made out of glass or clay. It is a container with a wide opening at the top and sometimes it has a fitted lid on top to close it. It is usually used for storing all types of food. If you want to preserve pickles, you put them in a jar. Also, when you buy spaghetti sauce, it usually comes in a jar. So the jar has a top on it that closes tight. Please put the jar in the freezer.

5. Place the **tongs** on the dish drainer. You use tongs to pick up things like ice cubes to drop them in drinks. The tongs look like scissors. Please put the tongs on the dish drainer.

6. Leave the saucepan on the front right-side **range.** A range is where you would cook food, right directly on top of the fire. A range is the top part of a stove. Place the saucepan on the front right-side range.

7. Take the **strainer** and put it on the shelf. A strainer is an object you use to strain or filter liquids. For example, when you prepare pineapple juice you would use a strainer to filter the juice. You use a strainer to separate the liquid from the pulp. Place the strainer on the shelf.

8. The **ladle** belongs in the cupboard. A ladle is a spoon with a long handle and you use it to serve soups; so when you give soup to someone you use a ladle. Put the ladle in the cupboard.

9. Take the **colander** and put it on the counter, on the left side of the stove. A colander is a container that looks like a bowl with many holes and it is useful if you were making pasta. After you cook the pasta, you put the pasta in the colander so that you would drain all the water out. The water falls through the holes and all you have left is the pasta. Put the colander on the counter, on the left side of the stove.

10. Put the **skillet** on the counter, on the right side of the dish drainer. A skillet is a pan and is what you would use commonly to make eggs and to fry things. Put the skillet on the counter, on the right side of the dish drainer.

Second ten-minute session:

1. Put the **skillet** in the refrigerator. A skillet is a pan and is what you would use commonly to make eggs and to fry things. Put the skillet in the refrigerator.

2. Put the **pot** in the oven. A pot is a big container that you put over a fire when you want to cook large quantities of food. For example, you use a pot to prepare soups. You fill the pot with food and you put it on the fire and it will just cook for a long time. The pot is made out of metal and it looks like a deep bowl. Put the pot in the oven.

3. Take the **colander** and put it on the dish drainer. A colander is a container with many holes and it is useful if you were making pasta. After you cook the pasta, you put the pasta in the colander so that you would drain all the water out. The water falls through the holes and all you have left is the pasta. Put the colander on the dish drainer.

4. Put the **pitcher** in the trash can. A pitcher is a container made out of plastic or glass, it has a handle and a spout or lip. You use a pitcher to hold and pour liquids such as water, juice or beer. Put the pitcher in the trash can.

5. The **ladle** belongs in the drawer, right under the bowl. A ladle is a spoon with a long handle and you use it to serve soups; so when you give soup to someone you use a ladle. Put the ladle in the drawer, right under the bowl.

6. The **rolling pin** belongs on the shelf. A rolling pin is used in the preparation of pizzas. For example, you will need a rolling pin to make the dough round and flat; you will take the rolling pin to roll over the dough. Put the rolling pin on the shelf.

7. Take the **strainer** and put it in the sink. A strainer is an object you use to strain or filter liquids. For example, when you prepare pineapple juice you would use a strainer to filter the juice. You use a strainer to separate the liquid from the pulp. Place the strainer in the sink.

8. Place the **jar** on top of the refrigerator, right under one of the cupboards. A jar is a container made out of glass or clay. It is a container with a wide opening at the top and sometimes it has a fitted lid on top to close it. It is usually used for storing all types of food. If you want to preserve pickles, you put them in a jar. Also, when you buy spaghetti sauce, it usually comes in a jar. So the jar has a top on it that closes tight.. Please put the jar on top of the refrigerator, right under one of the cupboards.

9. Place the saucepan on the back **range.** A range is where you would cook food, right directly on top of the fire. A range is the top part of a stove. Place the saucepan on the back range.

10. Place the **tongs** on the floor. You use tongs to pick up things like ice cubes to drop them in drinks. The tongs look like scissors. Put the tongs on the floor.

APPENDIX F: Portuguese instructions for Input-Only group

Esta folha contém o desenho de **uma cozinha** e de vários **objetos** usados nela. Os objetos estão numerados. A atividade será realizada assim:

a. Eu, Angélica, lhe pedirei para colocar um determinado *objeto* em um dado *lugar na cozinha.* Você terá de *identificar o objeto* dentre as opções e colocar o *seu número* no lugar indicado por mim.

b. Em hipótese alguma você poderá interagir comigo, ou seja, você *não* poderá fazer perguntas.

c. Para cada objeto, você terá no máximo *um* (1) *minuto* para fazer sua escolha e colocar o número no lugar determinado por mim. Note que, *durante* esse minuto, eu *repetirei* pelo menos duas vezes o nome do *objeto* e o *lugar* em que ele deve ser colocado. Esgotado esse minuto, você terá *15 segundos* para colocar o número escolhido no lugar determinado.

d. Uma vez feita a sua escolha por determinado número, você *não* poderá *mudá-la*.

▪ A atividade seguirá os passos de **a** a **d** repetidas vezes.

▪ Essa atividade será realizada *duas vezes*, sendo que, na *segunda* vez, você receberá uma *folha diferente*, com o *mesmo desenho* e com os *mesmos objetos*. No entanto, os objetos terão *números diferentes* e deverão ser colocados em lugares diferentes na cozinha, de acordo com as minhas instruções.

Obrigada por participar deste projeto cujo objetivo é investigar os efeitos de duas abordagens de ensino sobre a aquisição de vocabulário.

APPENDIX G: Interactionally modified directions

First ten-minute session:
1. Put the **pot** in the sink.
    Possible Answers:
    a.   a large container used in the preparation of soups
    b.   a large container made out of metal used to make large quantities of soup
    c.   a container that is round and deep

2. Put the **pitcher** in the refrigerator.
    Possible Answers:
    a.   a container made out of plastic or glass which has a handle and spout or lip, for
         holding and pouring liquids
    b.   a pitcher looks like a large cup and is used to keep water cold

3. The **rolling pin** belongs on the counter on the left side of the bowl.
    Possible Answers:
    a.   a rolling pin is a cylinder of wood or other material used for rolling out dough
    b.   a rolling pin is used in the preparation of pizzas in order to make the dough round
         and flat

4. Place the **jar** in the freezer.
    Possible Answers:
    a.   a jar is a broad-mouth container, usually cylindrical and made out of glass
    b.   a jar is a container with a wide opening at the top and sometimes a fitted lid, which
         is usually used to store food
    c.   a container normally used to preserve food for long periods of time.

5. Place the **tongs** on the dish drainer.
    Possible Answers:
    a.   a device used for picking up objects, consisting of two long pieces of metal or
         wood which are joined at one end and are pressed together in order to hold an
         object between them.
    b.   A device for holding or lifting objects, consisting of a pair of arms hinged
         together
    c.   A device used in the kitchen to pick up ice cubes from a bucket and then droping
         them in a drink

6. Leave the saucepan on the **range,** on the front right-side burner**.**
    Possible Answers:
    a.   the top part or surface of a stove on which pans can be heated. A range has four gas
         or electric burners.
    b.   A range is the top part of a stove where you place pans directly on the fire.

7. Take the **strainer** and put it on the shelf.
    Possible Answers:
    a.   any device for straining liquids

    b. is a device that works as a filter and it looks like a net
    c. if you needed to separate the pulp from pineapple juice, you would use a strainer

8. The **ladle** belongs in the cupboard.
    Possible Answers:
    a. a long-handled utensil with a cup-shaped bowl for dipping or conveying liquids.
    b. A big spoon with a long handle and a deep cup-shaped part, used especially for serving soups.

9. Take the **colander** and put it on the counter on the left side of the stove.
    Possible Answers:
    a. a container with a perforated bottom for draining foods.
    b. a bowl with a lot of holes in it, used for washing food or for removing water, especially that in which vegetables have been cooked.
    c. a container used when you cook pasta and you want to get rid of the water

10. Put the **skillet** on the counter, on the right side of the dish drainer.
    Possible Answers:
    a. a pan for frying food
    b. a flat metal pan with a long handle which is used to fry food like eggs

Second ten-minute session:
1. Put the **skillet** in the refrigerator.
    Possible Answers:
    a.   a pan for frying food
    b. a flat metal pan with a long handle which is used to fry food like eggs

2. Put the **pot** in the oven.
    Possible Answers:
    a.   a large container used in the preparation of soups
    b.   a large container made out of metal used to make large quantities of soup
    c. a container that is round and deep

3. Take the **colander** and put it on the dish drainer.
    Possible Answers:
    a.   a container with a perforated bottom for draining foods.
    b.   a bowl with a lot of holes in it, used for washing food or for removing water, especially that in which vegetables have been cooked.
    c. a container used when you cook pasta and you want to get rid of the water

4. Put the **pitcher** in the trash can.
    Possible Answers:
    a.   a container made out of plastic or glass which has a handle and spout or lip, for holding and pouring liquids
    b. a pitcher looks like a large cup and is used to keep water cold

5. The **ladle** belongs in the drawer, right under the bowl.
    Possible Answers:
    a. a long-handled utensil with a cup-shaped bowl for dipping or conveying liquids.
    b. a big spoon with a long handle and a deep cup-shaped part, used especially for serving soups.

6. The **rolling pin** belongs on the shelf.
    Possible Answers:
    a. a rolling pin is a cylinder of wood or other material used for rolling out dough
    b. a rolling pin is used in the preparation of pizzas in order to make the dough round and flat

7. Take the **strainer** and put it in the sink.
    Possible Answers:
    a. any device for straining liquids
    b. is a device that works as a filter and it looks like a net
    c. if you needed to separate the pulp from pineapple juice, you would use a strainer

8. Place the **jar** on top of the refrigerator, right under one of the cupboards.
    Possible Answers:
    a. a jar is a broad-mouth container, usually cylindrical and made out of glass
    b. a jar is a container with a wide opening at the top and sometimes a fitted lid, which is usually used to store food
    c. a container normally used to preserve food for long periods of time.

9. Put the saucepan on the **range,** the one on the back**.**
    Possible Answers:
    a. the top part or surface of a stove on which pans can be heated. A range has four gas or electric burners.
    b. a range is the top part of a stove where you place pans directly on the fire.

10. Place the **tongs** on the floor.
    Possible Answers:
    a. a device used for picking up objects, consisting of two long pieces of metal or wood which are joined at one end and are pressed together in order to hold an object between them.
    b. a device for holding or lifting objects, consisting of a pair of arms hinged together
    c. a device used in the kitchen to pick up ice cubes from a bucket and then droping them in a drink

APPENDIX H: Portuguese instructions for Input-Interaction group

Esta folha contém o desenho de **uma cozinha** e de vários **objetos** usados nela. Os objetos estão numerados. A atividade será realizada assim:

    a. Eu, Angélica, lhe pedirei para colocar um determinado *objeto* em um dado *lugar na cozinha***.** Você terá de *identificar o objeto* dentre as opções e colocar o *seu número* no lugar indicado por mim.

    b. Você pode interagir comigo durante a atividade, isto é, você *pode fazer*, em *inglês*, todas as *perguntas* necessárias para esclarecer o *significado dos objetos*.

    c. Para cada objeto, você terá no máximo *um* (1) *minuto* para esclarecer suas dúvidas e *15 segundos* para efetuar a sua escolha (ou seja, escolher um número e colocá-lo no lugar determinado).

    d. Uma vez feita a sua escolha por determinado número, você *não* poderá *mudá-la*.

- A atividade seguirá os passos de **a** a **d** repetidas vezes.
- Essa atividade será realizada *duas vezes*, sendo que, na *segunda* vez, você receberá uma *folha diferente*, com o *mesmo desenho* e com os *mesmos objetos*. No entanto, os objetos terão *números diferentes* e deverão ser colocados em lugares diferentes na cozinha, de acordo com as minhas instruções.

Obrigada por participar deste projeto cujo objetivo é investigar os efeitos de duas abordagens de ensino sobre a aquisição de vocabulário.

APPENDIX I: Portuguese instructions for Input-Output group

Primeira Parte

Esta folha contém o desenho de **uma cozinha** e de vários **objetos** usados nela. Os objetos estão numerados. A atividade será realizada assim:

a. Eu, Angélica, lhe pedirei para colocar um determinado *objeto* em um dado *lugar na cozinha*. Você terá de *identificar o objeto* dentre as opções e colocar o *seu número* no lugar indicado por mim.

b. Você pode interagir comigo durante a atividade, isto é, você *pode fazer*, em *inglês*, todas as *perguntas* necessárias para esclarecer o *significado dos objetos*.
c. Para cada objeto, você terá no máximo *um* (1) *minuto* para esclarecer suas dúvidas e *15 segundos* para efetuar a sua escolha (ou seja, escolher um número e colocá-lo no lugar determinado).
d. Uma vez feita a sua escolha por determinado número, você *não* poderá *mudá-la*.

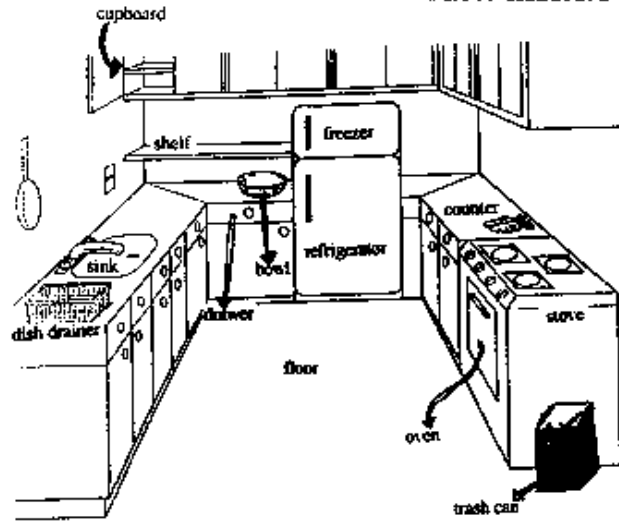▪   A atividade seguirá os passos de **a** a **d** repetidas vezes.

Segunda parte

Você receberá uma folha diferente, com o *mesmo desenho* e com *10 objetos* também constantes na folha anterior. Note que esses objetos possuem números diferentes dos anteriores. A atividade será realizada assim:
a. Você me pedirá, **em inglês**, que coloque um determinado *objeto* em um dado *lugar na cozinha*. Eu terei de *identificar o objeto* dentre as opções e colocar o *seu número* no lugar indicado por você.
b. Eu poderei *interagir com você*, isto é, eu poderei lhe fazer perguntas para esclarecer as minhas dúvidas.
c. Você terá apenas *um* (1) *minuto* para dar o comando para cada objeto.
d. Caso você *não saiba* o nome do objeto em inglês, dentro desse um *minuto*, você poderá *perguntá-lo*, em *inglês*, a mim. Você *não* poderá *dizer* o *número* do objeto ou *mostrar o objeto* ao instrutor.
e. Esgotado esse um minuto, o instrutor terá *10 segundos* para fazer sua escolha e colocar o número no lugar indicado por você.
▪   Os passos de **a** a **e** serão repetidos até que se esgotem as palavras.

Obrigada por participar deste projeto cujo objetivo é investigar os efeitos de duas abordagens de ensino sobre a aquisição de vocabulário.

APPENDIX J: Handout 2

Locational Expressions

cupboard

shelf

freezer

refrigerator

counter

sink

bowl

dish drainer

drawer

floor

oven

stove

trash can

A is under B

B is on (top of) A

B is between A and C

C is next to B, on the right

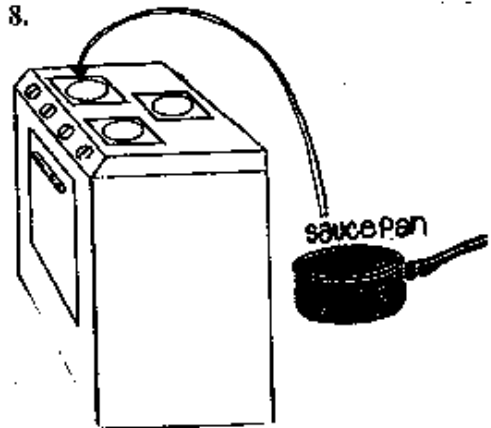A is next to B, on the left

B is behind A

A is in front of B

1.

2.

3.

4.

5.

6.

7.

8.

saucepan

9.

10.