

Universidade Federal de Minas Gerais

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**PROCESSING, REPRESENTATION AND
LEARNABILITY OF THE RESULTATIVE
CONSTRUCTION BY BRAZILIAN
PORTUGUESE-ENGLISH BILINGUALS**

Belo Horizonte, Brazil
December – 2016

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PORTUGUESE-ENGLISH BILINGUALS**

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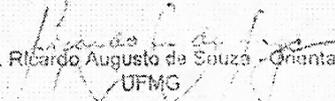
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PROCESSING, REPRESENTATION AND LEARNABILITY OF THE
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ENGLISH BILINGUALS

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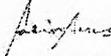
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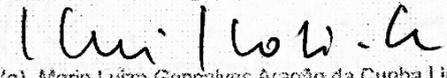
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To my beloved parents, Zilá and Samuel (in memoriam).

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“The secret of sound education is to get each pupil to learn for himself, instead of instructing him by driving knowledge into him on a stereotyped system.”

(Baden-Powell)

ABSTRACT

This Ph.D. dissertation addresses possible bilingualism effects on speakers' linguistic processing and representation through a psycholinguistic methodology. Our primary focus is the analysis of how bilingualism can influence bilinguals' first language (L1), but we also investigate possible phenomena present in the acquisition of a second language (L2)-specific structure. More specifically, the research objectives are (i) to verify whether bilinguals exhibit reduced processing cost to read an L2-specific construction in the L1, (ii) to analyze whether these bilinguals accept this construction in their L1 and (iii) to investigate if bilinguals learn both the licensed and the unlicensed features of this construction in the L2. The participants are highly proficient Brazilian Portuguese (BP)-English bilinguals immersed either in the L1 or in the L2. The target structure is the resultative construction (e.g., Samuel wiped the table clean) and our control structure is the depictive construction (e.g., Samuel ate the salmon raw). Both constructions are grammatical in English, but only the depictive is licensed in BP. Furthermore, we observe how the participants process and perceive some ungrammatical resultative sentences (e.g., Samuel twisted the toy broken) in English. In order to reach the research objectives, we conducted a series of experiments using the Maze Task (MT) and the Acceptability Judgment Task (AJT) paradigms in both BP and English. The results from the experiments in BP indicate that both immersed and non-immersed bilinguals process the adjective in the resultative construction significantly faster than BP monolinguals. However, bilinguals and monolinguals perceived the resultative construction as less acceptable than the depictive construction. These results suggest that bilingualism can exert influence on L1 linguistic processing, but such influence does not result in changes in bilinguals' overall L1 grammar, at least in regards to the constructions

under scrutiny. The data from the experiments in English indicates that bilinguals and monolinguals process the resultative construction as fast as they process the depictive construction. They also show an additional processing cost when reading the ungrammatical resultative sentences. Moreover, bilinguals and monolinguals do not differ significantly from each other in their acceptability judgments of the resultative sentences in English, but bilinguals give significantly higher acceptability ratings to the ungrammatical resultative sentences as compared to monolinguals. These results suggest that bilinguals can learn L2-specific constructions, but they are less sensitive to L2-specific restrictions than monolinguals are. We discuss all these findings in light of different theoretical perspectives, among which we highlight the Multi-Competence, the Multiple-Grammars and the Negative Evidence hypotheses.

KEYWORDS: Resultative Construction; Bilingualism; Language Representation; Language Processing, Learnability.

RESUMO

Esta tese de doutorado aborda possíveis efeitos de bilinguismo no processamento e na representação linguística através de uma metodologia psicolinguística. Nosso foco primário é a análise de como o bilinguismo pode influenciar a primeira língua (L1) dos bilíngues, mas também investigamos possíveis fenômenos presentes na aquisição de uma construção específica à segunda língua (L2). Mais especificamente, esta pesquisa tem por objetivo: (i) verificar se bilíngues apresentam custo de processamento reduzido na L1 para uma construção específica à L2, (ii) analisar se esses bilíngues aceitam tal construção na L1 e (iii) investigar se os bilíngues aprendem tanto os traços licenciados quanto aqueles não licenciados dessa construção na L2. Os participantes são bilíngues do par linguístico português brasileiro (PB) e inglês com alto nível de proficiência imersos na L1 ou na L2. A estrutura-alvo é a construção resultativa (e.g., *Samuel wiped the table clean/ Samuel esfregou a mesa limpa/até deixa-la limpa*) e a estrutura-controle é construção descritiva (e.g., *he ate the salmon raw/ ele comeu o salmão cru*) tanto em PB quanto em inglês. Ambas as construções são gramaticais em inglês, mas somente a descritiva é licenciada em PB. Ademais, observamos como os participantes processam e percebem algumas sentenças resultativas agramaticais (e.g., *Samuel twisted the toy broken/ Samuel torceu o brinquedo quebrado/ até quebra-lo*) em inglês. Para alcançar os objetivos da pesquisa conduzimos uma série de experimentos utilizando os paradigmas tarefa labirinto e a tarefa de julgamento de aceitabilidade em PB e em inglês. Os resultados obtidos nos experimentos em PB indicam que bilíngues processam o adjetivo na construção resultativa de maneira significativamente mais rápida do que os monolíngues. Contudo, bilíngues e monolíngues percebem a construção resultativa como menos aceitável do que a construção descritiva. Os resultados sugerem que o bilinguismo pode exercer influência

no processamento em L1, mas tal influência não resulta em mudanças na gramática de L1, pelo menos em relação as construções sob escrutínio. Os dados dos experimentos em inglês apontam que bilíngues e monolíngues processam a construção resultativa tão rapidamente quanto processam a construção descritiva. Eles também se assemelham ao exibirem um custo processamento adicional quando leem sentenças resultativas agramaticais. Além disso, bilíngues e monolíngues não se diferem significativamente em julgamentos de aceitabilidade da construção resultativa em inglês, mas bilíngues exibem aceitabilidade significativamente mais alta para as sentenças resultativas agramaticais em comparação com os monolíngues. Esses resultados sugerem que bilíngues podem aprender uma construção específica à L2, mas eles são menos sensíveis às restrições específicas à L2 do que os monolíngues. Discutimos todos esses achados à luz de diferentes perspectivas teóricas, dentre as quais destacamos a Multi-Competência, a Gramáticas-Múltiplas e a Hipótese da Evidência Negativa.

PALAVRAS-CHAVE: Construção Resultativa; Bilinguismo; Representação Linguística; Processamento Linguístico; Aprendizabilidade.

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LIST OF ABBREVIATIONS

ANOVA – Analysis of Variance
AJ – Acceptability Judgment
AJT – Acceptability Judgment Task
AP – Adjectival Phrase
ARG-ST – Argument Structure
BIA+ – Bilingual Interactive Activation Plus
BP – Brazilian Portuguese
DET – Determiner
DIM – Diminutive
DOR – Direct object restriction
IL – Interlanguage
INF – Infinitive
L1 – First language
L2 – Second language
LM – Language Modes
MA – Massachusetts
MC – Multi-competence
MG – Multiple-Grammars
MG – Minas Gerais
MS – Milliseconds
MT – Maze Task
NP – Noun Phrase
NEH – Negative Evidence Hypothesis
PP – Prepositional Phrase
PST – Past
POSS – Possessive
PRON – Pronoun
ResP – Resultative predicate
RHM – Revised Hierarchical Model
RT – Reaction Time
SAJT – Speeded Acceptability Judgment Task
SD – Standard Deviation
SEM – Semantics
SLA – Second Language Acquisition
SPR – Self-Paced Reading
SUBJ – Subject
SYN – Syntax
UFMG – Federal University of Minas Gerais
VLT – Vocabulary Levels Test.
WI – Wisconsin

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1. Initial considerations

This study aims to address possible changes caused by bilingualism in linguistic representation and in language processing routines. In the research field of bilingualism, two important goals are (i) the delimitation of the areas (syntax, semantics, phonology, pragmatics, morphology, etc.) in which the bilinguals' languages can be integrated and (ii) the aspects of the second language (L2) that are challenging in terms of learnability. These strands of research are of paramount importance for the study of bilingualism since they shed light on relevant questions about language comprehension mechanisms, which will be discussed in detail in the following chapters.

1.1 Bilingualism-related terms

We understand bilingualism as the regular use of more than one language (GROSJEAN, 2013). L2 learning can take place simultaneously with the acquisition of the first language (L1) or later. In this study, we focused on bilingual individuals who are late L2 learners to observe the possibility of changes in their cognitive system derived from the acquisition of a new skill.

“Bilingual” and other related terms have different interpretations and definitions in the literature. Thus, we will briefly define relevant terms that will be used frequently throughout this study. Different words are used in the literature to describe speakers who have some sort of knowledge of an L2. Cook (1997) argues in favor of the term “L2 user”, which seems to define well the type of speaker that we intend to address: people who utilize an L2. According to the author, the term “bilingual” sometimes contributes to the idea that only those who have native-like performance are successful in acquiring an L2.

The term “second language learner” has the drawback that it might entail that the speakers will never reach a certain goal. In this study, we chose to use both the terms “L2 user” and “bilingual”, assigning to both the meaning given to the former by Cook (op. cit.).

Other terms that generate discussions in the bilingualism field are “acquisition” and “learning”. As argued by Ferrari (2010), “acquisition” usually refers to a more spontaneous process that occurs in contexts where the L2 is the prevalent language in social interactions. A common example of this situation is the immersions in countries in which the bilingual’s L2 is spoken as a native language. In contrast, “learning” usually refers to a less natural process, as in contexts of formal instruction. In this paper, we will use the two terms interchangeably, but we will investigate both bilinguals who have learned the L2 mostly in formal contexts in a country where the L1 was the dominant language and bilinguals who have learned the L2 in a more natural context in which the L2 was the dominant language.

To summarize, this study seeks to scrutinize issues related to bilingualism by investigating L2 users/ bilinguals who are native speakers of Brazilian Portuguese (BP) and who have learned / acquired English as an L2 later in life. Also, we will compare the participants who learned English mostly in contexts where the L1 was the dominant language with those who have learned/ acquired English mostly in contexts where the L2 was the dominant language.

Next, we will present the motivation for our study on bilinguals’ processing, representation and learning.

1.2 Contextualization and objectives

The holistic view of bilingualism regards the mind of the L2 user as a whole that cannot be decomposed into separate parts. According to Grosjean (2008), bilingual speakers cannot be analyzed as individuals who are monolinguals in two languages. Rather, one must understand them as speakers who use two linguistic subsystems that rarely work independently. This proposal is in accord with the theoretical construct of Multi-Competence, which suggests that the languages present in the bilingual mind remain always active and interconnected.

Currently, many studies suggest that the cognitive system of bilingual speakers has significant differences compared to the cognitive system of monolingual speakers (BIALYSTOK, 2001; 2005; BIALYSTOK et al., 2009; BIALYSTOK; CRAIK, 2010). Most of these studies show that bilinguals tend to outperform monolinguals in tasks that involve cognitive control. These findings have been characterized as a possible bilingual cognitive advantage whose origin is related to the bilinguals' need of inhibiting one of their languages to use the other. This class of findings thus also lends support (indirectly, at least) to models of bilingual cognition where the two languages are represented in a shared space.

Recent studies on the organization of languages in the bilingual mind, according to Bialystok (2005), show that each of the two languages remain active while processing the other language. However, most of these studies focus on L1 activation during the use of the L2. Furthermore, some of these studies investigate only bilinguals with possible dominance inversion, i.e., speakers whose L2 is the dominant language. Finally, many of these studies focus on lexical processing. This study, in contrast, aims to contribute to this line of research with other types of evidence: analysis of possible manifestations of L2

influence during and after L1 processing of argument structure by bilinguals whose L1 is dominant.

To achieve this goal, we will investigate the behavior of BP-English bilinguals while reading sentences in BP (L1) that include an English (L2)-specific argument structure: the resultative construction. More specifically, the sentences that will be tested are instances of the true resultative construction, which has the same syntactic-semantic features of the sentence in (1). By analyzing how bilinguals with the aforementioned profile behave in the L1 when they read an argument structure construction licensed only in the L2, we will seek evidence of possible changes in the L1 caused by bilingualism.

1. Samuel wiped the table clean.

In the Psycholinguistics Laboratory of the Federal University of Minas Gerais (UFMG), where this research was mostly conducted, other studies have been carried out to address similar issues. There are studies on the behavior of BP-English bilinguals towards the induced movement alternation (2) (SOUZA; OLIVEIRA, 2011; SOUZA, 2012; SOUZA, 2014a; SOUZA et al., 2014); the ditransitive construction (3) (ZARA, 2009; ZARA et al., 2013) and the resultative construction (OLIVEIRA; SOUZA, 2012; OLIVEIRA, 2013; 2014; 2015; SOUZA et al. 2014.). These studies suggest the possibility of cross-linguistic influences from the L1 to the L2 and from the L2 to the L1. The data further suggests that the intensity of this influence depends on its direction (L1→L2 or L1←L2), on the construction involved and on the type of task performed by the participants.

2. The trainer jumped the lion through the hoop
(SOUZA, 2012, p. 231)
3. Joe told Mary a story.
(ZARA, 2009, p. 41)
4. John hammered the metal flat.
(OLIVEIRA, 2013, p. 15)

The results concerning the resultative construction suggest that BP-English bilinguals differ from both BP monolinguals and English monolinguals. In BP, BP-English bilinguals with high proficiency give significantly higher acceptability ratings to sentences that force the resultative construction in comparison to BP monolinguals. Notwithstanding the significant difference, both bilingual and BP monolingual groups gave low acceptability ratings to the resultative construction in BP. In English, BP-English bilinguals with low proficiency gave significantly lower acceptability ratings to the resultative construction as compared to English monolinguals and to bilinguals with high proficiency. The latter two groups did not show significant differences compared to each other. In sum, it seems that bilinguals exhibit more learnability problems in the L2 in lower levels of proficiency and more changes in the L1 in higher levels or proficiency.

All the previous results on how BP-English bilinguals behave when reading the resultative construction were obtained through non-speeded Acceptability Judgment Tasks (AJTs). Souza & Oliveira (2014) highlight the importance of conducting (i) AJTs in which participants have limited exposition to each item and (ii) tasks that focus on the online processing in order to have a better comprehension of the bilinguals' behavior towards the resultative construction. As asserted by Carneiro & Souza (2012), information on online processing is critical to experimental studies on the L2, since the

speed and fluidity of access to representations during language processing have an important role in defining the degree of skill in a second language.

In order to further examine the behavior of BP-English bilingual speakers in relation to the resultative construction, we will conduct experiments using Speeded Acceptability Judgment Task (SAJTs) and Maze-Task (MT) paradigms in both BP and English. The first task seeks to gauge the acceptability of the resultative construction while using time pressure to increase the influence of speakers' implicit knowledge. The second task yields data on the behavior of speakers during language processing. We will discuss both tasks in more detail in Chapter 4.

1.3 Research objectives and hypothesis

To achieve the research objectives, we formulated the following research questions:

- a. Compared to BP monolinguals, do highly proficient BP-English bilinguals exhibit lower processing costs in the L1 for sentences that force the resultative construction?
- b. Compared to BP monolinguals, do highly proficient BP-English bilinguals give higher acceptability ratings to sentences in the L1 that force the resultative construction?
- c. Compared to English monolinguals, do highly proficient BP-English bilinguals exhibit extra processing cost for the resultative construction (grammatical and ungrammatical) in the L2?

- d. Compared to English monolinguals, do highly proficient BP-English bilinguals give lower acceptability ratings to the resultative construction (grammatical and ungrammatical) in the L2?

To answer these questions, we proposed the following hypotheses:

- a. Compared to BP monolinguals, BP-English bilinguals with high proficiency will exhibit a lower processing cost in the L1 for sentences that force the resultative construction.
- b. Compared to BP monolinguals, BP-English bilinguals with high proficiency will give higher acceptability ratings to sentences in the L1 that force the resultative construction in comparison to BP monolinguals.
- c. Compared to English monolinguals, BP-English bilinguals with high proficiency will not exhibit a different processing cost in the L2 for the resultative construction (grammatical or ungrammatical).
- d. Compared to English monolinguals, BP-English bilinguals with high levels of proficiency will not give different acceptability ratings to the resultative construction, except when it is ungrammatical.

1.4 Dissertation organization

This Ph.D. dissertation is organized into five chapters in addition to the initial considerations and the final considerations. In chapter 2, we present the target structure of our study: the resultative construction. In Chapter 3, we discuss theoretical models and empirical studies that address cross-linguistic influence and learnability processes in the

bilingual mind. In Chapter 4, we present the materials and methods used in each of the experiments, as well as their results. In chapter 5, we interpret and discuss the results based on the theoretical framework we adopted.

2. Resultative construction

2.1 Argument structure constructions

This study aims to shed light on issues of bilingualism by making an analysis of the representation and processing of certain argument structure constructions. The term “argument structure” refers to the subcategorization of one or more phrases by a predicator in order to fully realize its semantic properties (SALAMOURA; WILLIAMS, 2007). In other words, the argument structure is understood as the selection of specific syntactic elements by a predicator in order to fulfill its thematic roles. In theories of formal syntax, such an operation is usually called c-selection¹. In (5), for example, the verb phrase (VP) <run> subcategorizes only an agent as an external argument, which is realized by a noun phrase (NP). The verb <give>, differently, subcategorizes an agent as an external argument, a recipient and a theme as internal arguments, which are also realized by NPs.

5. [Samuel]_{NP} ran.

6. [Samuel]_{NP} gave [his friend]_{NP} [the ball]_{NP}.

The term “construction” refers to form-meaning pairings that are not strictly predictable from their component parts (GOLDBERG, 2003). According to Goldberg & Casenhiser (2006), constructions usually do not completely follow the general principles of a given language and, as a result, speakers must learn their patterns separately. However, they are not simple idioms that are learned individually. Rather, they are

¹ Category Selection

patterns whose rules can be identified and defined. By way of illustration, the authors show the verb <slice> being used in different argument structure constructions:

7. He sliced the bread.
(transitive)

8. Pat sliced the carrots into the salad.
(caused motion)

9. Pat sliced Chris a piece of pie.
(ditransitive)

10. Emeril sliced and diced his way to stardom.
(way construction)

11. Pat sliced the box open.
(resultative)

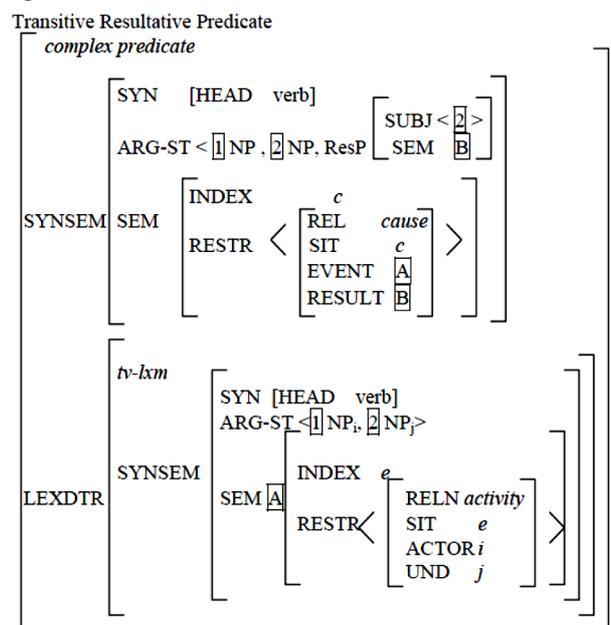
(GOLDBERG; CASENHIER, 2006, p. 6)

The sentences above demonstrate that the same verb may appear with different argument structures. While in (7) <slice> selects an internal argument and an external argument, in the other sentences it seems to select more arguments. In (11), for example, <slice> has a second argument, an adjective phrase (AP) indicating the result of the action. The constructional approach, according to Goldberg (1995), assumes that the structural differences in the sentences above are due to the variation in the constructions' argument structure and not in the verb <slice> itself. This approach assumes that the constructions are the basic units of language and exist independently of specific words (GOLDBERG, 1995; BOAS, 2002).

Thus, in all these sentences <slice> has only two arguments, which are those present in (7). The other arguments observable in the other sentences are subcategorized by the construction itself. That means that the AP <open> in (11) is an argument of the resultative construction, but not an argument of the verb <slice>. In sum, according to the constructional approach, the argument structure of the verb <slice> will always be X SLICE Y. However, <slice> can be inserted in a construction, such as the resultative construction, which has its own argument structure to realize its semantics (X CAUSES [Y BECOME Z]) and, therefore, sentences with the same VP may vary in amount and type of arguments.

According to lexicalist approaches, such differences are specified in the verb itself, as illustrated in FIG. 1, extracted from Boas (2000). Note that the description of the argument structure (ARG-ST) includes three arguments: two NPs and one resultative predicate (ResP), which is the argument that indicates the result of the action.

Figure 1 – Structure of the resultative construction in HPSG²



Source: Boas (2000, p. 9)

² Head-Driven Phrase Structure Grammar approach.

Regardless of the approach – lexicalist or constructional – it is interesting to note the human mind’s ability to deal with the challenges posed by natural languages. The language comprehension system, for example, has compositional operations that are capable of joining the lexical knowledge and grammatical knowledge to allow a speaker to correctly map the same syntactic structure to different meanings. The sequence NP-VP-NP-AP, for example, can be mapped to at least four different constructions: (12) small clause, (13) depictive construction, (14) pseudo-resultative construction and (15) true resultative construction. Notice how the APs are interpreted differently in each of the following sentences:

12. My father considers my hair long.
(small clause)
13. My grandmother brushed my hair wet.
(depictive)
14. The barber cut my hair short.
(pseudo-resultative)
15. The breeze blew my hair dry.
(resultative)

The small clause (ROTHSTEIN, 1995; GOMES; FOLTRAN, 2009) is a construction that relates the subject and the predicate, but it does not have verb tense. Such construction is a primary predicate and the subject is not thematically licensed outside the predication relation in which it occurs. According to Pylkkänen & Mcelree (2006), this construction does not have a causal relationship and it is not assertive. In (12), for example, the hair is only considered long, i.e., the NP <my father> is not the cause of

the hair's state and there is no certainty about the existence of such state. Thus, in NP-VP-NP-AP sentences that instantiate a small clause, the AP describes only a possible state of the object NP.

As well as the small clause, the depictive construction also has no causal relationship. However, the depictive construction has assertiveness since its AP describes the state of the object NP³ during the verbal action. In (13), for example, the AP <wet> describes the state of the NP <my hair> during the action described by the VP <brushed>. As a result, in depictive constructions formed by sentences with the pattern NP-VP-NP-AP, the AP is the modifier of an argument.

The pseudo-resultative construction or adverbial resultative construction is characterized mainly by the use of an AP with an adverbial function. Marcelino (2014) demonstrates with a series of tests that in this type of construction the AP modifies the result of the verbal action. For sentences such as (14), the result of the action expressed by the VP <cut> is "being cut" and the AP <short> changes that result. The How-Test (RECH, 2007; KNÖPFLE, 2010; OLIVEIRA; MARCELINO, 2014; BERTUCCI, 2014; MARCELINO, 2014) can be used to test such a proposal: the AP in (14) can be used as an answer for the question "How did your mom cut your hair?". Furthermore, the pseudo-resultative construction is formed by accomplishment verbs, i.e., verbs that describe actions that have an inherent endpoint, such as <cut>.

The pseudo-resultative construction has a resultant state, but it does not have resultativity. According to Bertucci (2014), the resultant state is present in the events that lexically entail a change of state. Resultativity, conversely, is present in events that do not entail such a change lexically and, hence, they need an additional element to indicate it.

³ The AP of a depictive construction can also modify a subject NP as in: "he left the party angry"

Therefore, the AP in a pseudo-resultative construction with the pattern NP-VP-NP-AP describes the manner of the verbal action.

Finally, the true resultative construction has as its main characteristic the fact that it has resultativity. This construction is usually formed by an atelic activity verb, but it becomes telic due to the presence of an AP indicating the result/ endpoint of the verbal action. Thus, in (11), the subject NP <the breeze> performed the action described by the VP <blew> until the object NP <my hair> acquired/ reached the property described by the AP <dry>. In this way, the AP of a true resultative construction functions as a limit of the verbal action and it indicates the property acquired by the NP object due to the verbal action and such a change is not entailed lexically.

In a plethora of studies, the pseudo-resultative construction is introduced as a resultative construction (BOAS, 2000; 2002; LOBATO, 2004; GOLDBERG; JACKENDOFF, 2004; ETTLINGER, 2005; LEITE, 2006). In Leite (2006), for example, those constructions are discussed as subsets of the resultative construction and receive different nomenclatures. The resultative construction, on the one hand, is termed “complex event” in which, according to the author, we have a second event that follows the first. The pseudo-resultative construction, on the other hand, is denominated co-identification event, in which the two processes occur in tandem and in a proportional manner.

Although these two structures share significant structural similarities, they differ in some respects and, hence, should be treated separately. Unlike the resultative construction, the pseudo-resultative construction not only responds positively to the How-Test, but it also cannot be paraphrased by "until it was", as pointed out by Levinson (2007). The sentences below illustrate this difference: (16a) is equivalent to (16b) and (17a) is different from (17b). According to the author, this difference can be explained by

the fact that the pseudo-resultative construction does not exhibit event-argument homomorphism, an aspect that will be discussed in more detail in section 2.3. Also, the two constructions differ in relation to their productivity in some languages. In Romance languages, the pseudo-resultative construction, as opposed to the resultative construction, tends to be productive. These differences illustrate why these constructions deserve to be approached differently.

16. a. I hammered the metal flat.
b. I hammered until the metal was flat.
17. a. I braided her hair tight.
b. I braided until her hair was tight.

The variations in the syntactic-semantic mapping of apparently identical structures, like we observe in the sentences presented and discussed above, seem to be easily and naturally acquired by monolingual speakers. However, argument structure varies cross-linguistically and, hence, bilinguals may acquire it in a less smooth manner. As argued by Juffs (1998), the cross-linguistic variations in argument structure can subtly affect parsing decisions and, consequently, performance in comprehension activities. Accordingly, some argument structure constructions can be considered important tools for studies on bilingualism because they can shed light on phenomena peculiar to L2 learning, such as cross-linguistic influence. Below we describe how the syntactic pattern discussed above, in (12) - (15), is mapped to the semantic level in BP.

18. *Meu pai considera o meu cabelo longo.*
My father considers DET my hair long.
'My father considers my hair long.'

19. Minha avó escovou o meu cabelo molhado.
My grandmother brush(PST) DET my hair wet.
'My grandmother brushed my hair wet'
20. O barbeiro cortou o meu cabelo curto.
DET barber cut(PST) DET my hair short.
'The barber cut my hair short.'
21. A brisa soprou o meu cabelo seco.
DET breeze blew DET my hair dry.
'The breeze blew my dry hair.'

Notice that the syntactic-semantic mapping in sentences (18), (19) and (20) is similar to their English counterparts. In (18) we have a small clause whose AP <longo/long> is interpreted as a possible state of the object NP <cabelo/hair>. The sentence in (19) is an instance of the depictive construction, i.e., its AP <molhado/wet> modifies the object NP <cabelo/hair>. In (20) we have a pseudo-resultative construction, which means that the AP <curto/short> modifies the resulting state of the verbal action described by the VP <cortar/cut>. As a result, we can say that these three constructions – small clause, depictive and pseudo-resultative - are similar in English and BP in relation to their structure and meaning.

The sentence in (21), however, is not similar to the sentence in (15) with respect to syntactic-semantic mapping. In (15), as mentioned earlier, the AP <dry> refers to the state acquired by the object NP <hair> as a result of the verbal action. In (21), differently, the AP <seco/dry> refers to the state of the object NP <cabelo/hair> during the verbal action. In other words, the sentence in (15) has a resultative interpretation whereas its structural counterpart in BP has a depictive reading, as in (13). This makes the resultative construction a tool with considerable potential for the investigation of L2 acquisition phenomena. By analyzing how bilinguals represent and process such a structure in the L1

and the L2, it is possible to understand possible effects of inhibition and cross-linguistic influence.

In the following section, we will present the target construction of this study – the resultative construction – and the peculiarities that make it interesting for our study.

2.2 The resultative construction in English

In English, it is possible to express resultativity with a considerable range of syntactic patterns. As pointed out by Wechsler & Noh (2001), one possibility is to express causativity (22) and resultativity (23) with different clauses. Another possibility is to use only a sentence consisting of a compound predicate, as in (24). Usually, only the latter possibility is denominated resultative construction. This is in accordance with the definition of construction proposed by Goldberg & Casenhiser (2006), who states that the meaning of a construction is not strictly predictable from its component parts. As one can observe, the meaning of (22) + (23) can be fully predicted from their component parts, but the meaning of (24) cannot. The resultative construction has very specific rules that do not apply to other patterns of sentences that also express resultativity.

22. John hammered the metal,
23.
 - a. consequently, the metal became flat.
 - b. resulting in the metal becoming flat.
 - c. thereby flattening it.
 - d. until it was flat.
 - e. causing it to flatten.

24. John hammered the metal flat.

(WECHSLER; NOH, 2001, p. 394)

Since the 90's, the English resultative construction has received special attention in researches on argument structure and syntax-semantics interface both by minimalist approaches (ROTHSTEIN, 2001; FOLLI; RAMCHAND, 2001; EMBICK, 2004) and by constructional approaches (GOLDBERG, 1995; GOLDBERG; JACKENDOFF, 2004; ETTLINGER, 2005). For Boas (2000), the reason for this interest lies in the fact that the syntax and the semantics distribution of this construction poses a challenge to some theories. In this study, our interest in the resultative construction lies in the differences between BP and English, briefly illustrated above, that make the acquisition of this construction potentially harder for BP-English bilinguals. As will be shown below, the resultative construction has a complex syntactic-semantic structure because its licensing depends on subtle event structure configurations and also because its surface structure is mapped to a different reading in BP; more specifically, the same order of constituents receives a depictive reading.

The resultative construction is characterized by the fact that it creates, through a complex predication, a causativity relation between two events and a changing relation between an event and a resultant state (BERTUCCI, 2014). In (24), for example, the first event is [JOHN HAMMER THE METAL], the second event is [JOHN FLATTEN THE METAL] and the resultant state is [THE METAL BECOME FLAT]. As shown by Bertucci (2014), the first event causes the second event or, in other words, John hammering the metal cause John flattening the metal. Furthermore, the second event carries the result of the action, that is to say, John flattening the metal causes the metal to be flattened.

From a constructional approach point of view, the first event is the verbal event, since it is determined by the verb of the sentence, whereas the second event is the constructional event, since it is determined by the construction itself. Note that the distribution of arguments occurs harmoniously: <John> is the subject of both events, <the metal> is the object of both events and <flat> is the resultant property of the constructional event. Thus, the verbal event has two arguments, whereas the constructional event has the same two arguments plus one, namely the AP that indicates property.

This harmony among the arguments of both events is named Full Argument Realization (GOLDBERG; JACKENDOFF, 2004, p. 547). It states that, for the sentences to be well-formed, all the arguments that are obligatorily licensed by the verb and all the arguments that are obligatorily licensed by the construction should be realized simultaneously in the syntax, sharing syntactical positions if necessary.

The resultative construction is formed by a compound predicate: the primary predicate whose nucleus is the verb and the secondary predicate or resultative predicate, whose nucleus is an AP⁴. The resultative predicate not only expresses the result of the verbal action, but it also defines the action's endpoint, which generates telicity. This aspect is often attested in the literature with prepositional phrases that indicate the telicity of the event. Note that the sentence (25) does not license the durational adverbial <for X time> in (26a), but it licenses the frame adverbial <in X time> in (26b). The opposite effect can be seen in (27) when the resultative predicate is omitted from the sentence (27a) and (27b). Therefore, these examples demonstrate that the resultative predicate turns activity events into accomplishment events.

⁴ As we will see below, some authors also argue that the resultative predicate can be formed by a PP.

25. a. *John hammered the metal flat for an hour.
b. John hammered the metal flat in an hour.
26. a. John hammered the metal for an hour.
b. *John hammered the metal in an hour.

(LOBATO, 2004, p. 145)

One characteristic of the true resultative construction is the fact that it predicates only on the direct object NP. In other words, contrary to what happens with the depictive construction, the resultative construction is not able to predicate on the subject of the sentence. Levin & Rappaport-Hovav (1995) call such a restriction the direct object restriction or (DOR). According to the authors, the DOR predicts that if a verb has no object, it cannot be used with a resultative predicate.

To illustrate this fact, based on Simpson (1983, p. 145), the authors mention an example that demonstrates the necessity of using the fake reflexive pronouns in the object position in order to predicate on the entity in the subject position. In (27), in order to create a secondary/ resultative predication on the entity described by the NP in the subject position, it is necessary to have a reflexive pronoun in the object position, even though both the resultative predicate (28) and the reflexive pronoun (29) are not licensed one without the other.

27. Dora shouted herself hoarse.
28. *Dora shouted hoarse.
29. *Dora shouted herself.

(LEVIN; RAPPAPORT-HOVAV, 1995, p. 35)

The authors relate the DOR to a semantic notion called The Change of State Linking Rule (LEVIN; RAPPAPORT-HOVAV, 1995, p. 51). According to this rule, the NP that undergoes a change of state due to the event described by the VP should be the direct object of the verb that forms the core of VP.

The resultative construction also appears to have morpho-phonological restrictions. Marcelino (2007) shows that the resultative structures have a strong tendency to be formed by verbs that are not originated from Romance languages and that are either monosyllabic or disyllabic with initial stress, as illustrated in the examples given by the author⁵.

Goldberg & Jackendoff (2004) point out that the resultative construction should be treated as a family of subconstructions due to the large syntactic and semantic variation encountered in it. Considering all the syntactic-semantic patterns indicated by the authors, it can be said that the resultative construction shows variation in regards to transitivity, causativity, resultative predicate phrase and, inter alia, resultative predicate semantics. To exemplify this variability, we introduce the four main sub-constructions of the resultative construction family:

30. Causative Property Resultative:

Example:	Bill watered the tulips flat.
Syntax:	NP ₁ V NP ₂ AP/PP ₃ .
Semantics:	X ₁ CAUSE [Y ₂ BECOME Z ₃].
Means:	[verbal subevent].

⁵ The examples mentioned by Marcelino (2007, p. 112) are: a. cook the lamb dry; b. wipe the table clean; c. knock the man dead; d. kick the door open; e. hammer the nail flat; f. cut his victims open; g. buy the shop empty; h. kill someone dead; i. wash her hands clean; j. cook the stove black; k. wipe a tear dry; l. dance oneself dizzy; m. bleed oneself dry; n. spend oneself dry; o. water the tulips flat; p. run the carpet thin; q. pop the trunk open; r. cut someone loose; s. drink the teapot empty; t. work oneself silly; u. sing someone sleepy/awake; v. push the door open; x. shout oneself hoarse; y. run one's sneakers threadbare; z. nail the window shut.

31. Non-Causative Property Resultative:

Example: The pond froze solid.
Syntax: NP₁ V AP/PP₂.
Semantics: X₁ BECOME Y₂.
Means: [verbal subevent].

32. Non-Causative Path Resultative:

Example: The ball rolled down the hill.
Syntax: NP₁ V PP₂.
Semantics: X₁ GO Path₂.
Means: [verbal subevent].

33. Causative Path Resultative:

Example: Bill rolled the ball down the hill.
Syntax: NP₁ V NP₂ AP/PP₃.
Semantics: X₁ CAUSE [Y₂ BECOME Z₃].
Means: [verbal subevent].

(GOLDBERG; JACKENDOFF, 2004, p. 563)

The causative property resultative sub-construction (30) is formed by a transitive verb and its resultative predicate is represented by an adjective phrase (AP) or a prepositional phrase (PP) indicating a property achieved by the object NP due to the verbal action whose agent is the subject NP. The non-causative property resultative sub-construction (31) is formed by an intransitive verb and its resultative predicate is represented by an AP or a PP indicating a property achieved by the subject NP due to the verbal action. The non-causative path resultative sub-construction (32) is formed by an intransitive verb and its resultative predicate commonly represented by a PP that indicates the path taken by the subject NP due to the verbal action. Finally, the causative path resultative sub-construction (33) is formed by a transitive verb and its resultative predicate is usually represented by a PP that indicates the path taken by an NP object due to the verbal action whose agent is the subject NP.

Goldberg & Jackendoff (2004) also accentuate that the resultative construction with transitive verbs can be subdivided into two groups: selected transitive resultative and unselected transitive resultative. The selected transitive resultative (34) refers to those sentences in which the object is independently selected by the verb, i.e., the object can be selected by the verb even if they are not within a resultative construction (35). The unselected transitive resultative (36), on the contrary, refers to those sentences in which the object is not independently selected by the verb. Accordingly, if the resultative predicate is omitted from this structure, the sentence will become ungrammatical (37). In the literature, these constructions can also be referred to as lexically transitive (selected) and lexically intransitive (unselected) (BOAS, 2000).

34. The gardener watered the flowers flat.

35. The gardener watered the flowers.

36. They drank the pub dry.

37. *They drank the pub.

The focus of this study will be the causative property resultative construction with an AP whose object is independently selected by the verb, as in (34). This substructure is also denominated true resultative construction (LEVINSON, 2007). According to the proposal of Wechsler (2005a), this construction fits into the type 1 resultative, whose sentences are formed by durative verbs that become accomplishment with the presence of the resultative predicate. Therefore, we excluded from our analysis sentences that, according to the author, constitute type 2 resultatives, whose sentences are formed by punctual verbs and APs that expresses the immediate result of the action, such as (38).

38. Firing a single bullet to the heart, Billy Bob shot him dead.

(GOLDBERG; JACKENDOFF, 2004, p. 561)

Notice that in the case of true resultative construction, the difference between the argument structure of the verb and the argument structure of the construction is only the resultative predicate. This argument of the resultative construction is intriguing not only because of its richness in meaning but also because of the complexities in its formation. The section below aims to address the resultative predicate features, focusing mostly in those encountered in the true resultative construction.

2.3 The resultative predicate

The resultative predicate seems to be permeated by very specific rules. Some of them are still seen as idiosyncratic by some authors, such as the rules that make (39) and (40) have different grammaticality status (GOLDBERG; JACKENDOFF, 2004; 2005). Other rules, particularly those involved in the formation of the true resultative construction, appear to be clearer, as shown below.

39. She ate herself sick.

40. *She ate herself ill.

Ettlinger (2005) states that there is still little information apropos the syntactic behavior of the resultative predicate. According to the author, the information is limited to the constituency of the resultative predicate and of the verb (41) and the positional requirement of the resultative predicate (42). The author also shows that the resultative

construction does not allow the resultative predicate to be topicalized (43) or to appear in the form of it-cleft construction (44).

- 41. a. *Samuel wiped the table happily dry.
b. Samuel wiped the table dry happily.
- 42. a. *Samuel wiped dry the table.
b. Samuel wiped the table dry.
- 43. *Clean Samuel wiped the table.
- 44. *It was clean that Samuel wiped the table.

The true resultative construction can be considered rigorous as regards the selection of the AP that forms the resultative predicate. In the depictive construction (45), as Ettliger (2005) contends, there are no selectional criteria between VP and AP, which means that any adjective can be used with any verb. Furthermore, there are not any semantic aspects that are introduced by the construction which are not predictable from its components. With the resultative construction (46), on the contrary, the AP must be semantically adequate for the rest of the sentence (ETTLINGER, *op. cit.*). More specifically the AP in the resultative construction must be able to express (i) causativity, (ii) the direct result of the verbal action and (iii) the endpoint of the verbal action. These properties make the construction itself incorporate meanings that are not part of its word components.

- 45. a. I cooked the carrots drunk.
b. I chopped my carrots raw.
- 46. a. *I cooked the carrots hard.

b. *I chopped my carrots soft.

(ETTLINGER, 2005, p.9)

Green (1972), Carrier & Randall (1992) and Goldberg & Jackendoff (2004) note that the resultative predicate does not license past participle adjectives (47). This restriction draws attention because it is not present in considerably similar contexts, such as the PP resultative construction with similar expressions (48) and constructions with verbs that express resultativity (49).

47. *He sang himself exhausted/bored/exhilarated.

48. He sang himself to exhaustion/ to boredom/ to exhilaration.

49. He made himself exhausted/ bored/ exhilarated.

(GOLDBERG; JACKENDOFF, 2004, p. 561)

The strong tendency of verbs in resultative constructions not being originated from Romance languages and being monosyllabic or disyllabic with initial stress, as pointed out by Marcelino (2007), also seems to apply to the resultative predicate. In other words, it is conjectured here that the resultative predicate tends to be formed by APs with such characteristics. This fact concerning words with Romance language origin is interesting because it can be linked to the unproductivity of the resultative construction in Romance languages.

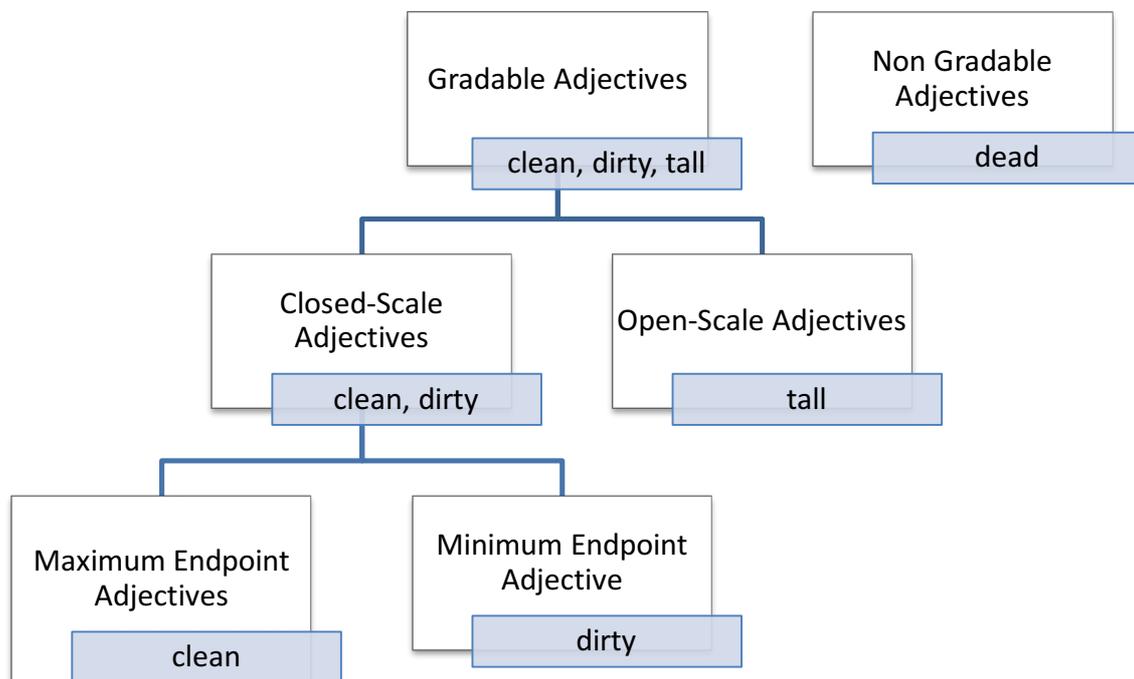
The restrictions present in resultative predicate of true resultative constructions have already been noted and discussed (GREEN, 1972; GOLDBERG, 1995; BOAS, 2000; 2002; WECHSLER, 2001; 2005a; 2005b; 2012; BROCCIAS, 2003; 2008;

ETTLINGER, 2005). Such restrictions are commonly exemplified by sentences such as (50):

50. He wiped the table clean/ dry/ *dirty/ *wet.

Goldberg (1995) and Wechsler (2001; 2005a; 2005b; 2012) noticed that the licensing of the adjectives in the resultative construction was related to their scalar properties. Adjectives can be classified as gradable and non-gradable. Gradable adjectives can be subdivided as closed-scale adjectives or open-scale adjectives. Finally, the closed-scales adjectives can be subdivided into maximum endpoint adjectives and minimal endpoint adjectives. This classification is illustrated in the table below:

Figure 2 – Adjectives classification according to their scalar properties.



Wechsler (2005) presents some tests that can be used to make the classification illustrated above. Gradable adjectives differ from non-gradable adjectives because they

represent properties that may have different intensities. Accordingly, gradable adjectives can be properly modified by adverbs expressing intensity. The adjectives in (51), for example, can be modified by the adverb <very>, whereas the adjective in (52), interpreted in its literal sense, does not accept such combination.

51. Samuel is very tall/ clean/ dirty.

52. *Samuel is very dead.

The licensing of an adverb modifier is also used to classify gradable adjectives into open-scale adjectives and closed-scale adjectives, according to Wechsler (2005). Open-scale adjectives are understood as those that describe a property whose intensity pattern is associated with the context and so it has no defined boundaries. Closed-scale adjectives, on the other hand, suit better the notion of boundaries. The adjective <high>, for instance, does not have a limit or, in other words, it does not have minimum or maximum value for height (0% height or 100% height). Hence, this adjective cannot be modified by adverbs expressing completeness such as <totally>, as illustrated in (53). Closed-scale adjectives, in contrast, are able to convey the idea of limit of its properties (54). When something is described as totally clean, for example, it is understood that the dirt scale reached its minimum (0% of dirt). Therefore, <clean> is a maximum value semantically set for the dirt scale, whereas its antonym, <dirty> represents any value above zero on the same scale.

53. *Samuel is totally tall.

54. Samuel is totally clean.

As exemplified above, the closed-scale adjectives can represent the limit of their scale – as <clean> represents 0% of the dirt scale – or any positive value of their scale – as <dirty>, which represent any value above zero in the dirt scale. Closed-scale adjectives that represent the limit of a scale are called maximum endpoint adjectives and the closed-scale adjectives that represent any positive value of their scale are classified as minimum endpoint adjectives. Wechsler (2005) points out that minimum endpoint adjectives differ from the maximum endpoint adjectives when modified by the adverb <almost>. Taking into consideration that <almost> means "about to reach a certain point", it seems to best suit maximum endpoint adjectives, as they clearly represent a point to be reached. Consequently, when the sentence (55) is uttered, it is understood that the dirt scale is reaching values close to zero. However, when using a minimum endpoint adjective, as in (56), the interpretation does not seem to be as clear. If sentences like (56) are accepted, the author argues that they would have different implications in comparison to sentences like (56). Whereas (55) does not imply "not dirty", (56) implies "not clean".

55. Samuel is almost clean.

56. ?? Samuel is almost dirty.

Based on this analysis of gradable adjectives properties, Wechsler (2012) proposes the Maximal Endpoint Hypothesis and an explanation for it. According to the author, there is a strong correlation between the maximum endpoint property and the ability of the adjective to be licensed in a resultative construction. The rationale is that the relation between verbs and adjectives in the resultative construction involves a homomorphic mapping between the temporal structure of the event described by the verb

and the scalar property described by the adjective. Therefore, the resultative construction favors the use of maximum endpoint adjectives.

Wechsler (2012) analyzes the corpus from Boas (2000) to test its proposal. This study shows the frequency with which open-scale adjectives, closed-scale adjectives with maximum endpoint and closed-scale adjectives with minimal endpoint occur in the corpus in the resultative constructions, in ECM (Exceptional Case Marking) constructions and in lexical causatives. After analyzing individually each type of adjective, Wechsler (2012) observes the frequency of closed-scale adjectives with a maximum endpoint in resultative constructions compared to all other types of adjectives. The results are shown in Table 1. The data suggests that there is an extremely strong correlation between closed-scale adjectives with maximum endpoint and the resultative construction.

Table 1 – Frequency of adjectives in the resultative construction and other constructions.

Adjective	Total	Resultative	non-Resultative	%Resultative
Maximum Endpoint	97.985	938	97.047	0,957%
Non-Maximum Endpoint	53.905	20	53.885	0,037%

Source: Wechsler (2012, p. 126)

Furthermore, the author also compares the frequency of these adjectives constructions expressing the cause of the state denoted by the adjective. The author compared the frequency of closed-scale adjectives with a maximum endpoint, such as <dry>, with the frequency of other adjectives in resultative constructions (57) and lexical causative (58). The results indicate that the closed-scale adjectives with a maximum endpoint are highly frequent in instances of the resultative construction, whereas other adjectives tend to be more frequently used in lexical causative. The statistical analyses confirmed the tendency of speakers to opt for resultative construction to express

causativity when the adjective is closed-scale with a maximum endpoint. The results are shown in TAB 2.

57. Mary wiped the table dry.
58. Mary got her hair dry.

(WECHLSER, 2012, p. 128)

Table 2 – The frequency of different types of adjectives in the resultative construction and in the lexical causatives.

Adjective	Total	Resultative	Lexical Causative	%Resultative
Maximum Endpoint	976	938	38	96,1%
Non-Maximum Endpoint	625	20	605	3,2%

Source: Wechsler (2012, p. 129)

The lack of empirical data in Wechsler's previous work (2001; 2005a; 2005b) gave rise to criticism concerning the author's proposals mainly due to the fact that the critics have found sentences that do not seem to fit his proposal (BOAS, 2003; BROCCIAS, 2003; IWATA, 2008). However, the analysis of Wechsler (2012) made it clear that there is a strong tendency of resultative constructions to be formed by closed-scale adjective with a maximum endpoint. This fact does not exclude the possibility that some sentences may not follow this tendency. The existence of counterexamples, however, does not diminish the importance of grammatical rules that are causal factors statistically significant. This proposal has already been influential to other studies (BEAVERS, 2002⁶ apud WECHSLER, 2012; UEGAKI, 2009⁷ apud WECHSLER, 2012; OLIVEIRA; SOUZA, 2012; OLIVEIRA, 2014).

⁶ BEAVERS, John. **Aspect and Distribution of Prepositional Resultative Phrases in English**. LinGO Working Paper #2002-7. Stanford CA: CSLI, Stanford University. 2002

⁷ UEGAKI, Wataru. **Japanese Resultative Phrases as Verbal Degree Modifiers**. Chronos 9, University of Paris. 2009.

In the section that follows, we will present the findings on the presence/ absence of the resultative construction in BP.

2.4 The resultative construction in Brazilian Portuguese

In addition to English, the resultative construction seems to be present in other languages, including German (KNÖPFLE, 2010; 2011), Chinese (ZHANG, 2009; YUAN; ZHAO, 2011), Japanese (NAKAZAWA, 2012) and Korean (WECHSLER; NOH, 2001; PARK; LAKSHMANAN, 2007). It is the contention of Kratzer (2005) that Romance languages do not license the resultative construction due to the impossibility of secondary predicate realization in the position it occurs in the resultative construction. One reason for this may be the fact that adjectives are inflected in these languages. According to Knöpfle (2011), such impossibility causes them to be unable to incorporate the causativity required by the resultative construction.

Nevertheless, the presence of the resultative construction in BP continues to be a topic of debate (FOLTRAN, 1999; MARCELINO, 2000; 2007; 2014; LOBATO, 2004; RECH, 2007; OLIVEIRA, 2013; OLIVEIRA; MARCELINO, 2014; BERTUCCI, 2014). Although some of these studies have some divergent opinions about the presence of the resultative construction in BP, it seems to be a unanimous view that the true resultative construction is not licensed in BP with the same syntactic-semantic patterns found in English. Rech (2007), for example, states that if we consider that the resultative construction involves a process that makes atelic events telic and not simply as a construction that expresses a result, we can conclude that BP does not form any resultative construction.

Lobato (2004) sets forth that the resultative construction is not productive in BP. According to the author, when the same syntactic pattern found in the English true resultative construction is used in BP, the semantic interpretation is different. In (59), for example, the AP <*plano*/flat> is interpreted as the property the NP <*metal*/metal> had before the verbal action denoted by the VP <*martelou*/hammered>. Based on that, the author asserts that BP does not license the interpretation of the AP <*plano*/flat> being a property acquired by the NP <*metal*/metal> as a result of the verbal action.

59. *Pedro martelou o metal plano.*
 Pedro hammer(PST) DET metal flat
 ‘Pedro hammered the flat metal.’

(LOBATO, 2004, p. 147)

Knöple (2011) also points out that BP does not license causative structures with intransitive verbs followed by accusative NPs and APs. In other words, the unselected resultative construction is not licit in BP with a resultative reading, as illustrated by the sentences (60) and (61). The author points out, however, that there are other structures with the NP-VP-NP-AP or similar patterns which have been considered instances of the resultative construction in the literature.

60. **Eles compraram o mercado vazio.*
 They buy(PST) DET market empty
 ‘They bought the market empty.’
61. **Ele cozinhou sua familia doente do estômago.*
 He cook(PST) POSS Family sick of stomach
 ‘He cooked his family sick of the stomach.’

(KNÖPFLE, 2011, p. 123)

Marcelino (2000) and Lobato (2004), the latter based on Foltran (1999) and Bisol (1975), point out other syntactic-semantic patterns in BP that can be considered examples of the resultative construction. For Marcelino (2000), the resultative construction in BP is formed by a resultative predicate that is initiated by the adverb <*bem*/well> followed by an adjective with the diminutive suffix <*-inho/-y*>, as illustrated in (62). Similar examples are also presented by Lobato (op. cit.) (63) and Rech (2007), (64).

62. *Joana picou o papel bem picadinho.*
Joana cut(PST) DET paper well cut(PART)(DIM)
'Joana cut the paper well cut.'

(MARCELINO, 2000, p. 53)

63. *João varreu o chão bem varridinho.*
John sweep(PST) DET floor well sweep(PART)(DIM)
'John swept the floor well swept.'

(LOBATO, 2004, p. 166)

64. *Joana limpou a casa bem limpinha.*
Joana clean(PST) DET house well clean (PART)(DIM)
'Joana cleaned the house well cleaned.'

(RECH, 2007, p. 93)

Such syntactic-semantic structure does not seem to be part of the resultative construction family for at least two reasons. The resultative predicate has an uncommon structure, since it starts with an adverb and it modifies the resultant state of the verbal action. In other words, the sentence (62) has a pseudo-resultative reading, which can be checked by the "How-test". The PP <*bem cortadinho*/ well cut> can be used as an answer to the question "how did Joana cut the paper?" The resultative construction responds negatively to this test, which is the reason why the author of this proposal himself acknowledged that the structure in (62) is, in fact, an instance of the pseudo-resultative

construction (MARCELINO, 2014). Therefore, it is possible to assert that the aforementioned constructions do not have resultativity. As will be noted, this seems to be the main problem among the structures that have been proposed as resultative construction in BP.

Lobato (2004) argues that the resultative construction exists in BP and that it has three basic characteristics: (i) presence of the object predicative, (ii) assignment of a new property to the object, due to the effect of the verbal action, (iii) interpretation of the event as accomplishment.

The author divides the resultative construction in BP into four groups based on the types of verbs involved: creation verbs, creation verbs with lexical specification of creation means, action on pre-existing object verbs and change of state verbs. The resultative construction with creation verbs is formed by transitive accomplishment verbs, as illustrated in (65). Furthermore, the AP is accepted in both the base form and in the superlative form. The resultative construction with creation verbs with lexical specification of creation means, illustrated in (66), is also formed by transitive accomplishment verbs. The AP, in this case, tend to have a superlative form. The resultative construction with verbs of action on pre-existing object, exemplified in (67), has a transitive accomplishment verb and its resultative predicate is formed by an AP in either basic or superlative form (or PP starting in *<em/in>*). Finally, the resultative construction with verbs of change of state has an unaccusative achievement verb and its resultative predicate is realized by an AP in superlative form (or PP starting in *<em/in>*, as shown in (68)

65. Creation verbs:

Deus criou os homens fracos.
God create(PST) DET man(PL) weak(PL)
'God created men weak.'

66. Creation verbs with lexically specification of creation means:

Ele desenhou o círculo torto.
He draw(PST) DET circle crooked
'He drew the circle crooked.'

67. Verbs of action on pre-existing object:

Ela cortou o cabelo curto.
She cut DET hair short.
'She cut the hair short.'

68. Verbs of change of state verbs:

O rio congelou solidíssimo.
DET river freeze(PST) solid(SUP)
'The river froze very solid.'

The sentences proposed by Lobato (2004) as instances of the resultative construction in BP have some details that suggest that they are not actually part of the resultative construction family, despite their similarities. The sentence in (65) has two possible readings. One of the possible interpretations is the depictive reading, in which the AP <*fraco/weak*> can be interpreted as the modifier of the NP <*homens/men*> and, hence, the sentence is interpreted as “God created the weak men”. The other possible reading is the pseudo-resultative, in which the AP modifies the result of verbal action and, hence, the phrase would be interpreted as “God created men in a manner that made them weak”. It seems that this sentence cannot have a resultative reading, in which the sentence would be interpreted as “God created men until they were weak”. Therefore, sentences such as (65) tend to receive either a depictive or a pseudo-resultative reading.

The sentences (66) and (67) have the same problems found in sentence (65). In (66) it is possible to obtain the depictive reading, for example, in contexts such as (69). The pseudo-resultative reading can be obtained if the sentence is interpreted as “he drew the circle in a manner that made it crooked”. The sentence (67) receives the depictive reading if the NP <hair> had the property described by the AP <short> before the verbal action. The pseudo-resultative reading is also possible if the sentence is interpreted as “he cut the hair in a manner that made it short”. Therefore, the sentences (66) and (67) also tend to have a depictive and a pseudo-resultative reading.

69. - *Quem desenhou o círculo torto e quem desenhou o círculo grande?*
 Who draw(PST) DET circle crooked and who draw(PST) DET circle big?
 ‘Who drew the crooked circle and who drew the big circle?’

- *Ele desenhou o círculo torto.*
 He draw(PST) DET circle crooked.
 ‘He drew the crooked circle’

Finally, the sentence in (68) does not sound acceptable to me, a native speaker of BP. The same occurs with other sentences introduced by Lobato (2004) as instances of the resultative construction, such as (70) and (71). In this case, it seems to me that the most appropriate procedure would be to test the grammaticality/ acceptability of these sentences and others with a similar syntactic-semantic structure.

70. **João pintou a mulher morena loira* (resultative reading).
 John paint(PST) DET woman brunette blonde
 ‘John painted the brunette woman blonde.’

71. **João pintou a casa torta* (resultative reading).
 John paint(PST) DET house crooked
 ‘John painted the house crooked.’

(LOBATO, 2004, p. 160-162)

According to Lobato (op. cit.), the resultative construction with action on pre-existing object verbs also includes sentences with election verbs, illustrated in (72) and (73). These sentences also appear to differ from the resultative construction for at least two reasons. First, the resultative predicate is not formed by an AP or a PP, but by an NP. Second, the common manner to paraphrase the resultative construction (LEVINSON, 2007) does not seem to apply to these sentences: “*??a turma elegeu até Paulo ser presidente/ ??The class elected until Paulo was president Paulo until*”. In fact, the third NP of these sentences seems to be part of the verb’s argument structure. In conclusion, it appears that once again we are not dealing with a resultative construction.

72. *A turma elegeu Paulo presidente.*
 DET class elect(PST) Paulo president
 ‘The class elected Paulo president’

(LOBATO, 2004, p. 168)

73. *A turma nomeou Pedro nosso representante.*
 DET class nominate(PST) Pedro POSS representative
 ‘The class nominated Pedro our representative.’

(RECH, 2007, p. 97)

Another possibility of resultative construction in BP that has been discussed is the one formed by the PP <até/until>. This construction, illustrated in (74), was introduced by Marcelino (2000), who named it “até clause”. According to the author, such construction occurs with unergative verbs. Bertucci (2014) present a similar construction (75), which he denominates “infinitive resultative construction”. The semantic similarity between the two constructions and the true resultative construction is noticeable.

74. *Ele andou até gastar os sapatos.*
He walk(PST) until wear-out(INF) DET shoes
'He walked until his shoes were worn out.'

(MARCELINO, 2000, p. 2)

75. *Maria esfregou o chão até brilhar.*
Mary wipe(PST) DET floor until shine(INF)
'Mary wiped the floor until they shined.'

(BERTUCCI, 2014, p. 625)

Wechsler & Noh (2001) discuss similar sentences in English such as (76). The authors claim that this type of structure can indeed express resultativity. However, they also contend that the term “resultative construction” is usually reserved for sentences such as (77), in which there is a secondary predicate. We agree with the authors that the term “construction” should be used as a reference to linguistic structures that have unique characteristics in their formal properties or in their semantic interpretations. In English, the resultative reading comes from a syntactic-semantic combination that maps the AP to an interpretation of result/ endpoint of the verbal action.

76. John hammered the metal until it was flat.

77. John hammered the metal flat.

(WECHSLER; NOH, 2001, p.394)

In sentences such as (74) and (75), dissimilarly, the AP yields a resultative reading through the preposition <até/until>. These sentences appear to be similar to the sentence in (78), in which <until> generates the resultative reading, according to Lobato (2004), but in this case, there is not a secondary predicate. Moreover, Rech (2007), citing Ilari

(2006⁸, apud RECH, 2007), points out that in resultative sentences with the PP <até/until>, the AP only indicates the limit of the action and not its final result. Notwithstanding the ability to express resultativity, it appears that the constructions with the PP <até/ until> do not belong to the resultative construction family.

78. *João martelou o metal até ele ficar plano.*
John hammer(PST) DET metal until it get flat
'John hammered the metal until it got flat.'

(LOBATO, 2004, p. 174)

Leite (2006) also introduces sentences in BP that could be considered part of the resultative construction family. It is the assertion of the author that the resultative predicate of a resultative construction can be in the verb, as illustrated in (79).

79. *A mulher alisou o cabelo.*
DET woman straighten(PST) DET hair
'The woman straightened the hair.'

Interpreting this sentence as an instance of the resultative construction is problematic because it goes against the very definition presented by the author of what a construction is: "C is a construction if and only if, C is a pair of form-meaning <F_i, S_i> in which some aspect of F_i, or some aspect of S_i, is not strictly predictable from the component parts of C or from pre-established constructions (LEITE, 2006, p. 27)."⁹ The whole meaning of the sentence in (79) is predictable from its components. Moreover,

⁸ ILARI, Rodolfo. Expressão do resultado e construções resultativas numa reflexão de Lúcia Lobato. GEL. 2006.

⁹ My translation. Original: C é uma construção se, somente se, C é um par de forma-significado <F_i, S_i> tal que algum aspecto de F_i, ou algum aspecto de S_i, não é estritamente previsível a partir de partes componentes de C ou a partir de construções pré-estabelecidas."

contrary to what happens with the resultative construction, there is not a complex predicate since there is not a verbal predicate expressing the cause of the change.

Leite (op. cit.) also states that the construction can come outside the verb as in (80). If this sentence is accepted in BP, it seems to have the same problem of most sentences discussed above, since the AP <solado/rubbery> modifies the resultant state of the action described by the accomplishment verb <assou/ baked>. As a result, this sentence does not have resultativity and, consequently it does not instantiate the resultative construction.

80. *A mulher assou o bolo solado.*
DET woman bake(PST) DET cake rubbery.
'The woman baked the cake rubbery.'

(LEITE, 2006, p.78)

Rech (2007) also shows a few sentences that might receive a resultative reading. The author asserts that causative alternation verbs license a "resultative adjective" because their semantics involve a change of state. The author goes on to state that such sentences, illustrated in (81), are grammatical despite their low frequency.

81. *O solo secou rachado.*
DET soil dry(PST) cracked
'The soil dried cracked.'

The grammaticality of the sentence in (81) seems questionable to me as a native speaker, but, even if it were grammatical, the sentence does not appear to be an instance of the resultative construction. If we paraphrase this sentence in the same way that we do with resultative sentences, we would have something like "*O solo secou até rachar*"/The

soil dried until it cracked.” It is understood that in this case, the soil dried up progressively until a crack was formed. However, <*rachado*/cracked> is not a limit on its scale; on the contrary, non-cracked would be the limit - 0% cracked. Therefore, the analysis made by Rech (op. cit.) on the AP <*rachado*/cracked> does not seem appropriate. The author states that this AP can be combined with the AdvP <*totalmente*/totally> to indicate that the described property has reached its endpoint, as in (82). In addition, <*secar*/dry> is an accomplishment verb and, hence, the sentence does not have resultativity.

82. ??*O solo secou totalmente rachado.*
 DET soil dry(PST) totally cracked.
 ‘The soil dried totally cracked’.

(RECH, 2007, p. 91)

The proposals of resultative construction in BP differ from the true resultative construction in many aspects. To certify the absence of the true resultative construction in BP, Oliveira & Marcelino (2014) conducted an AJT with the magnitude estimation paradigm. In this study, the participants were monolingual speakers of BP and the target items were sentences in BP which forced the resultative reading (83) and sentences that instantiated the depictive construction (84). As it can be seen below, both types of sentences had a syntactic-semantic pattern that mitigated the possibility of ambiguous reading.

83. *Uma das salas de aula estava suja, então Deise a varreu limpa.*
 One of/the rooms of class be(PST) dirty, so Daisy it(ACC) sweep(PST) clean
 ‘One of the rooms were dirty, so Daisy swept it clean.’

84. *Como Lina não teve tempo para grelhar o salmão, ela o comeu cru.*
 As Lina not have(PST) time to grill DET salmon, she it(ACC) eat(PST) raw
 ‘Since Lina didn’t have the time to grill the salmon, she ate it raw.’

The results indicate that the BP monolinguals gave significantly higher acceptability ratings to the depictive construction in comparison to the acceptability for the resultative construction. The acceptability of both constructions in a 0-to-1 scale, shown in TAB. 3 suggests that the true resultative construction, as opposed to the depictive construction, is not part of the BP grammar.

Table 3 – Standard deviation and mean acceptability ratings given to resultative construction and the depictive construction.

Construction	Means	Standard Deviation
Resultative	0,31	0,20
Depictive	0,73	0,22

Source: Oliveira & Marcelino (2014)

The previous discussion shows that the true resultative construction varies cross-linguistically. As opposed to English, BP does not license the resultative construction. The fact that the aforementioned construction has different grammaticality status in these languages makes it a valuable tool in the investigation of BP-English bilingual processing and representation.

The next section describes the theoretical framework of the bilingual mind adopted in this Ph.D. dissertation, on which we based the hypotheses for the results of our experiments.

3. The bilingual mind

3.1 The bilingual cognitive system

Research on bilingualism has shown that the presence of an L2 in the mind of an individual can exert considerable influence on their cognitive system. One such example noted in the literature is enhanced metalinguistic ability compared to their monolingual peers (COOK, 1997; BYALISTOK, 2001). However, this cognitive development does not seem to be restricted to linguistic areas. The possibility of bilingualism generating effects in non-verbal cognitive abilities is linked to the proposition that human knowledge, whether linguistic or not, share representational system resources of general domain and, hence, they can exert influence on each other (BIALYSTOK, 2005). Cook (1997) cites studies in which bilinguals outperform monolinguals on tests that require creativity, originality, fluency and flexibility. Bialystok (2005) confirms that this last feature had already been noticed in bilingual children since the 1960s. One possible explanation for the development of mental flexibility is linked to the experience that bilinguals have to describe, understand and interpret the world in at least two ways.

Other studies suggest that bilinguals may have a more developed cognitive control as compared to monolinguals (BIALYSTOK, 2001; MURPHY; PINE, 2003). Bialystok (2005) discusses a previous study in which bilingual and monolingual children performed the towers task. The participants were introduced to two towers which differed from each other in size. The taller tower had less blocks than the smaller one, but it was taller because its blocks were bigger than the other. The children were supposed to point out which one of the towers had more apartments (blocks). Thus, the children needed to inhibit the information related to the towers' height and focus on the number of blocks.

According to the author, the children had difficulty performing the task, but the bilinguals had a significantly better performance than the monolinguals as to the ability to resist the suggestion imposed by the towers' height. Bialystok et al. (2009) also discussed the effects of bilingualism on non-verbal cognitive processes in children and adults. The authors showed evidences that bilinguals tended to outperform monolinguals in tasks that required inhibition of distracting information, exchanging tasks and maintaining information while performing an activity. All these findings are interpreted as evidence that bilingualism can result in cognitive control development.

One of the most common interpretations for this possible bilingual cognitive enhancement is related to language inhibition. The rationale derives from the idea that the bilinguals' languages are always active, despite the fact that we do not usually perceive the languages being simultaneously active during communication. One possible explanation for this is the idea that bilinguals have an inhibitory system capable of inhibiting the language that is not being used, regardless of their activation, as discussed previously. As pointed out by Bialystok (2005), if the two languages share representational regions and are always active, as has been suggested by previous studies, there must be a mechanism capable of inhibiting unwanted intrusions of the language not in use.

Green (1998) proposes an inhibitory control model to explain how this occurs. According to the author, each word in the mental lexicon has a label that specifies the language to which it belongs. When the words of the unwanted language are activated, they are inhibited due to their labels and, consequently, the word selection occur almost always in the correct language. The constant activation of this inhibitory mechanism could explain why bilinguals tend to outperform monolinguals in tasks requiring inhibition of distracting information.

Many researchers continue to investigate whether both languages are constantly activated in the bilingual mind and whether different parts of bilinguals' grammar (syntax, phonology, morphology, semantics, pragmatics, etc.) are susceptible to cross-linguistic influence due to this co-activation. One of the goals of our study is to verify whether cross-linguistic influence can be observed at the level of argument structure.

Notwithstanding the aforementioned evidences, it is important to stress that the possibility of bilinguals having better attentional skills than monolinguals is still open to debate. Valian (2015) stresses that there are many inconsistencies in the findings about the effects of bilingualism on executive control especially with children and young adults. According to the author, these inconsistencies found between and within studies are related to the uncertainty about the aspects of executive control being tapped by each task. Therefore, deeper analysis on the reasons for these inconsistencies are required in order to clarify the possible corollaries of bilingualism on executive control.

In the sections that follow, we discuss two concepts, namely Interlanguage and Multi-Competence, which drew attention to the cognitive aspects involved in bilingualism, including language co-activation and cross-linguistic influence. After that, we will present different models of bilingual language representation both at the lexical and at the syntactic level. In addition, we will analyze a plethora of studies that relate to these models and concepts.

3.2 Interlanguage (IL)

The concept of "Interlanguage" (IL) (SELINKER, 1972) has been used to refer to the linguistic system developed by bilinguals when they learn their L2 later in life. Ferrari (2010) points out that IL should be understood as an independent system that is the result

of the learner's attempts to produce the rules of the target language. As pointed out by Souza (2014b), since the creation of the IL hypothesis, the L2 stopped being seen as a product of bilinguals' errors and it started being recognized as an independent linguistic system. The IL gained ground in the linguistic circles and the L2 began to be perceived as the result of several mental processes that are not necessarily copied or dependent on the L1 representation (SOUZA, op. cit.).

More recently, it was noticed that the concept of IL described bilinguals from a monolingualist view, i.e., it described bilinguals from a perspective that takes monolinguals as the norm (COOK, 1997). IL is considered a system that does not converge on target-like norms due to processes such as L1-to-L2 transfer, L2 learning strategies, L2 communication strategies and L2 rules overgeneralization. According to Grosjean (2013), this monolingualist view of bilingualism has several corollaries. Among these, the author points out (i) the description of bilinguals based on fluency and balance between languages, (ii) the assessment of bilinguals' language skills grounded in monolingual standards and, among others, (iii) the interaction between the bilingual's languages seen as anomalous and accidental. Recent studies on bilingualism suggest that this perspective does not adequately describe L2 users (GROSJEAN, 2013; BIRDSONG, 2005; 2009; COOK, 2003), as we will see below.

Analyzing L2 users on monolingual grounds does not seem to be the most appropriate strategy. Birdsong (2009) and Souza (2014b) point to the fact that, unlike what is observed in L1 acquisition, ultimate attainment of a late-acquired L2 can vary considerably from person to person. One possible explanation is that L1 acquisition appears to be favored by the period in which it occurs. During L1 acquisition, children's brain structure is considerably malleable, as pointed out by MacWhinney (2005), which causes the cognitive system as a whole to be more apt for development. Moreover, L1

acquisition is essential for the development of primary skills (e.g., thinking and communication) and children are engaged in learning everything around them with the support of a strong social system. Thus, it is possible to conjecture that the uniformity in L1 acquisition is due to a natural state among the speakers.

Differently from L1 acquisition in early childhood, in late L2 acquisition there are several factors that seem to influence ultimate attainment, such as motivation, aptitude, personality, anxiety and cognitive style (USHIODA, 2011). Souza (2014b) points to the fact that the L2 user is usually a cognitively mature individual who can make use of a pre-existing linguistic knowledge during the process of acquiring an L2. In addition, speakers learn an L2 for different reasons, such as tourism in another country or enjoying literature written in the L2. In sum, the L2 will be developed according to the characteristics, needs and interests of the speaker.

It is important to clarify that we do not intend to defend that the comparison between bilinguals and monolinguals is irrelevant. The comparison between these two types of speakers certainly provides non-trivial information for the understanding of each and enriches our understanding of the linguistic functioning of the human mind. Our contention here is that the recurring habit of using the performance of monolinguals as a basis to measure how successful the L2 acquisition is does not seem reasonable – although it is a common practice (BIRDSONG, 2009). According to Birdsong (2005), if this practice did not exist, the field of Second Language Acquisition (SLA) would never have proposed constructs such as fossilization and the critical period, since they come from a monolingualist perspective.

Analyzing the knowledge of an L2 based on monolingual speakers' knowledge would be the same as comparing a regular driver to a racecar driver. Just as regular and racecar drivers have different characteristics, reasons, goals and cars, L2 users have

different characteristics, reasons, goals and linguistic systems compared to monolingual speakers. However, keeping the metaphor, it is not impossible to make a regular driver a racecar driver. Birdsong (2009) argues that there are studies showing that bilingual speakers are able to have a native-like performance in terms of pronunciation, morpho-syntax and even processing. According to the author, it is possible to speculate with some degree of confidence that native-likeness is a possibility for individuals with high levels of motivation, education, L2 use, L2 dominance and aptitude for foreign languages.

In addition to regarding bilinguals' L2 acquisition as incomplete and imperfect, the concept of IL has another drawback: it seems to entail that the L1 is stable, intact and resistant to the effects of bilingualism. This idea is at odds with several psycholinguistic studies that show that the knowledge and/or processing of the L1 may be affected by L2 acquisition (VAN HELL, DIJKSTRA, 2002; COOK, 2003; DUSSIAS; SAGARRA, 2007; SOUZA et al, 2014). These findings will be discussed in more detail in the following sections. In short, the IL hypothesis not only maintains a monolingualist view, but it also puts forth the idea of L1 impermeability. More recently, another concept was proposed to describe bilingualism more accordingly: Multi-Competence.

3.3 Multi-Competence (MC)

Contrary to what is advocated in the monolingual view of bilingualism, the holistic view considers the bilingual's languages as part of an integrated language system that cannot be easily decomposed. As Grosjean (2013) points out, the bilingual is not the sum of two monolinguals, but an individual who has a linguistic system with a unique and specific configuration. The difference in performance is only a consequence of

bilinguals' different language use, i.e., bilinguals develop each language according to the needs imposed by the environment around them.

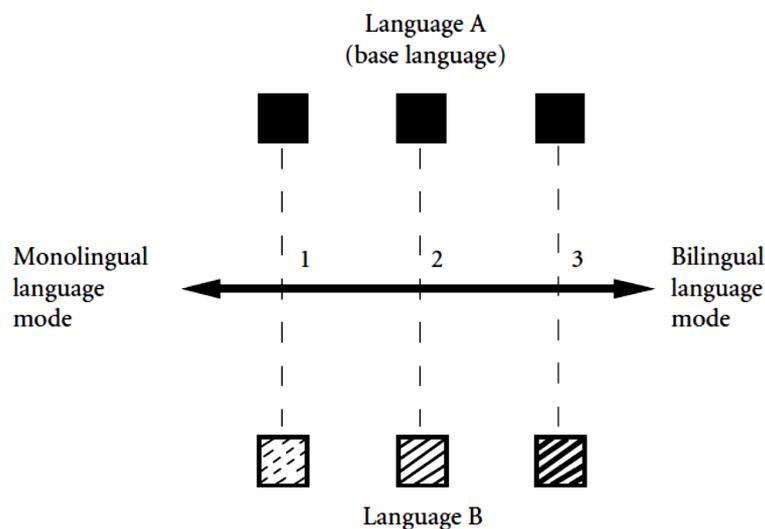
Cook (1991) proposes the concept of Multi-Competence (MC), which refers to this composite state of a system with two language grammars. It claims that the L2 user is the default speaker and the monolingual is a language-deprived speaker. Cook (1997) states that a monolingual has 100% of linguistic capacity in a single language, whereas L2 users who know only 5% of another language have a total of 105%. Thus, learning a second language increases the ability of an individual and, hence, it should be seen as a benefit and not as a problem.

According to MC, the languages present in the bilingual mind interact with each other, forming a single language super-system. In other words, the L1 interacts with the L2 and the L2 interacts with the L1. Moreover, the L1 and the L2 are not only integrated, but they also remain active regardless of the language being used, which is possible due to the inhibitory mechanism mentioned in the previous section. In this way bilinguals are qualitatively different from monolinguals of either their L1 or L2.

A theoretical construct that is compatible with the MC perspective is Language Modes (LM) (GROSJEAN 2013), illustrated in FIG. 3. In the figure, the speakers' position within the continuum is represented by the vertical lines and the degree of activation of each language is represented by the how dark the square is. According to this idea, the different environments in which L2 users find themselves fall within a continuum that ranges from a fully monolingual to a fully bilingual mode. The activation of a bilingual's two languages varies along this continuum. Thus, when a bilingual is in an interaction with individuals who only speak his or her L1, for example, he or she will tend to disable the L2 as much as possible, entering a monolingual mode in using the L2. At this time the activation of the L2 will be lower in comparison to contexts in which the

parties involved are also bilinguals in the same languages. In sum, we can understand the LM construct as the degree of activation of the language not in use in a given context.

Figure 3 – Visual representation of the Language Mode continuum.



Source: Grosjean (2013, p. 40)

It is important to note that the author argues that there is always some residual activation and, as a result, the languages are never completely deactivated. In addition, the language not in use hardly ever reaches the same activation levels of the language in use. It is also relevant to say that the language (not) in use can be either the L1 or the L2.

Grosjean (2013) cites studies in which it is argued that bilinguals try to limit possible influences of the language not in use as much as possible when they interact with monolinguals. However, when bilinguals are communicating with other bilinguals, they do not limit the use of the other language as much and, consequently, they may use words and structures from both languages, i.e., they may code-switch.

The LM can, therefore, play an important role in predicting the degree of cross-linguistic influence. The MC perspective assumes the possibility that the L1 can exert influence on the L2 and the L2 can exert influence on the L1. The intensity of such an influence may vary, amongst others, according to the bilinguals' place along the LM

continuum. In this study, we will conduct experiments that aim at observing if bilinguals exhibit behavior that suggest cross-linguistic influence (both on the L1 and on the L2) in a context that do not encourage the activation of the language not in use or, in other words, in a monolingual mode.

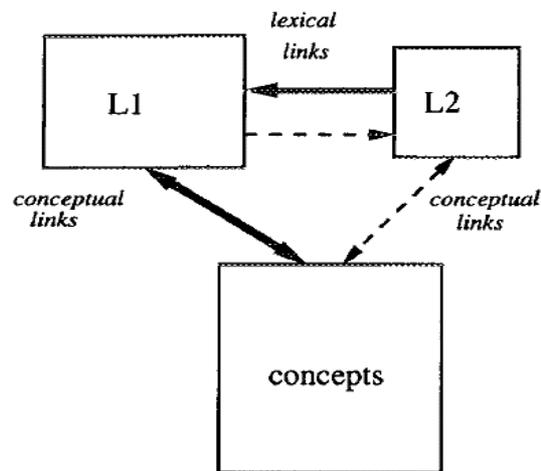
In the following sections, we discuss some findings on the relationship between the L1 and the L2 in the bilingual mind both at the lexical and syntactic level. Most of these studies focus on possible cross-linguistic influence because if languages are represented and/ or processed independently, there seems to be no reason for the existence of any linguistic influence (HOHENSTEIN et al., 2006).

3.4 Cross-linguistic influence at the lexical level

The relationship between the L1 and the L2 at the levels of processing, representation and production has been investigated mostly in regards to the lexicon. In this field of study, there seems to be a consensus that the languages do interact in the bilingual mind. This relationship between languages in the bilingual lexicon has been addressed in important theoretical models.

A theoretical model that has brought relevant contribution to understanding the functioning of the bilingual mind with regards to lexical access was the Revised Hierarchical Model (RHM) (KROLL; STEWART, 1994), shown in FIG. 4. According to this model, the bilingual mind has a lexicon for the L1 and another for the L2. Each language is interconnected via lexical links and both are connected to the conceptual box.

Figure 4 – The Revised Hierarchical Model.



Source: Kroll & Stewart (1994, p. 158)

The model postulates that links from the L2 to the L1, or between the L1 and the conceptual box, are stronger than any links directed at the L2. Kroll & Stewart (1994) justify this difference by arguing that bilinguals often associate L2 words to their equivalents in the L1. BP-English bilinguals, for instance, associate new lexical forms (house) with their translation equivalent in the L1 (*casa*) and only the L1 form has a strong link to the conceptual box. Therefore, to access the meaning of the new word (house), speakers start out by accessing the L1 translation (*casa*) and then going from the L1 translation to the semantic level. With time, direct links from the L2 lexical level to the semantic level and from the L1 lexical level to the L2 lexical level, are strengthened through repeated access.

Kroll & Stewart (1994) supported the model by showing empirical evidence that L2-to-L1 translation is significantly faster than L1-to-L2 translation. The explanation lies in the fact that L1-to-L2 translation is largely mediated by the conceptual box, whereas the L2-to-L1 translation occurs based on a simple association between words. The authors also tested the model by utilizing a translation test to verify whether L1-to-L2 translation is more influenced by the conceptual box than the translation in the opposite direction is.

The authors compared the reaction times (RTs) for the translation of randomized lists to the RTs for the translation of categorical lists. During the L1-to-L2 translation, categorical lists were translated faster than the randomized ones were. L2-to-L1 translations, dissimilarly, did not show a significant difference between the two lists. The data indicates that the L1-to-L2 translation is sensitive to semantic effects whereas L2-to-L1 translation is not. Therefore, the data is consistent with the RHM idea that L2-to-L1 translation is faster than L1-to-L2 translation due to the fact that only the latter is mediated by the semantic level.

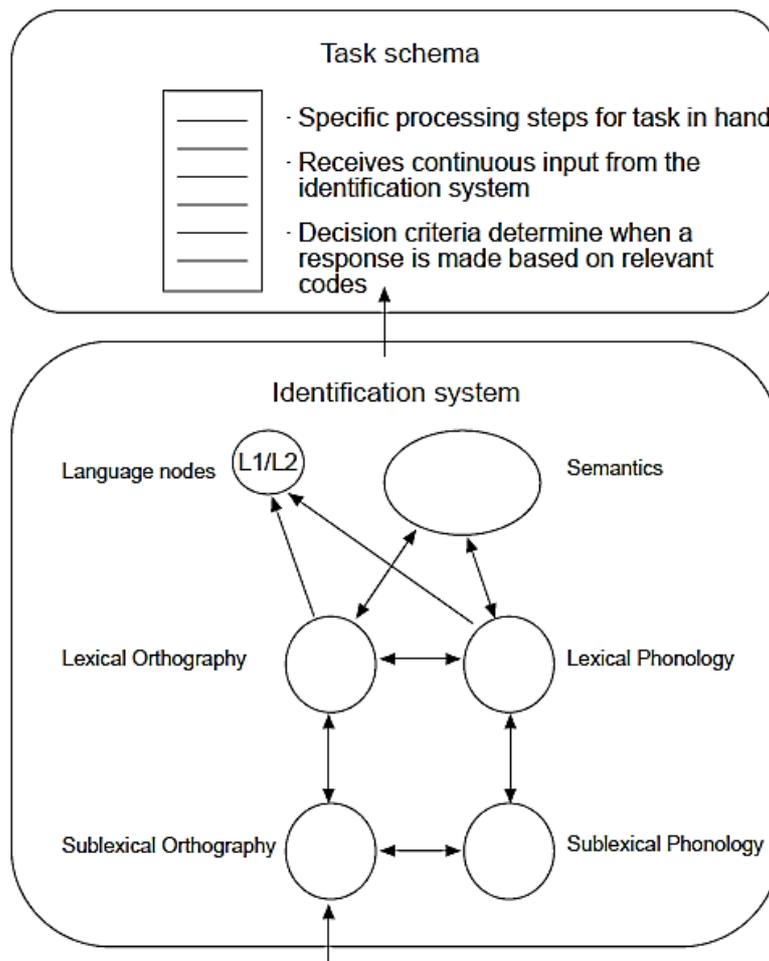
The RHM also raised interest in another topic: can the bilingual comprehension system be selective with respect to the languages involved? Dijkstra et al. (1998) tested Dutch-English bilinguals' performance in a lexical decision test in the L2. Target items were identical interlexical homographs - words with similar writing, but different meanings in each language – and identical cognates – words that are similar in meaning and spelling in each language. Bilinguals were faster in responding to identical cognates. This result can be interpreted as supporting non-selective access to the bilingual lexicon.

Van Hell & Dijkstra (2002) investigated L2-to-L1 influence on lexical access. The authors conducted three experiments, a word association task and two lexical decision tasks, in which they observed the processing of cognate and non-cognate words by Dutch-English-French trilinguals. In all tasks, the trilinguals with high proficiency responded faster to L1 words that were cognates to either their L2 or L3 than to non-cognates. Considered together, the results of Dijkstra et al. and Van Hell & Dijkstra indicate that bilingual lexical access is non-selective with respect to the languages being accessed.

A theoretical model that seems to explain more efficiently some of the behavioral and psycholinguistic data aforementioned has been proposed by Dijkstra & Van Heuven (2002): The Bilingual Interactive Activation + Plus (BIA+), illustrated in FIG. 5. This

model presupposes the existence of two subsystems: the word identification subsystem and the task/ decision subsystem. Visual input activates the orthographic sublexical representation is activated in the word identification subsystem. Simultaneously, the lexical orthographic and the sublexical phonological representations are activated. The latter activates the lexical-phonological representation. The two lexical representations – orthographic and phonological – activate the semantic representation and also the language nodes, which are responsible for linking the visual input to a specific language. The task/ decision subsystem uses all this information from the word identification subsystem to perform a task.

Figure 5 – Bilingual Interactive Activation Plus (BIA+).



Fonte: Dijkstra e Van Heuven (2002, p. 182)

One of the most noticeable differences between the BIA+ and the RHM is that the former assumes the existence of an integrated lexicon whose access is parallel and non-selective. Thus, during lexical access, bilingual speakers access a single system, which is composed of information from all their languages. It is also assumed that the different levels of representation – orthographic, phonological, lexical and sublexical – constantly interact.

According to BIA+, a bilingual undergoes several steps to translate a word from one language to another. In order to translate the word “advertise” from English to Portuguese, for instance, BP-English bilinguals use phonological and orthographical clues to separate the representation of “advertise” and a BP false cognate: “*advertir*”, which means to warn. Notwithstanding the use of these clues, bilinguals will automatically activate the meaning of both “advertise” and “*advertir*”. This information is stored in the bilingual working memory and is used by the task/decision system. Only at that point, bilinguals decide which activated information is more appropriate for the task at hand.

It is clear from the previous discussion that the RHM and the BIA+ make different predictions about bilingual lexical access. The biggest difference between the two models is the fact that one presupposes the existence of separate lexicons for the L1 and the L2 (RHM) and the other assumes the existence of an integrated lexicon (BIA+) and a task/decision subsystem. Despite their distinctions, the two models, in line with several empirical studies, assume that there is an interaction between the languages in the bilingual mind during lexical access. As we will see next, this intercommunication between languages is not as clear at the syntactic level as it seems to be at the lexical level.

3.5 Cross-linguistic influence at the syntactic level.

As shown in the previous section, many studies have focused on linguistic processing and representation at the lexical level and there is a general consensus that lexical knowledge of the L1 and the L2 interacts in the bilingual mind (KROLL; STEWART, 1994; DIJKSTRA; VAN HEUVEN, 2002; DE GROOT 2002; DIJKSTRA, 2007; PAVLENKO, 2009). However, studies about cross-linguistic influence are not limited to the lexicon and in other levels of the grammar this phenomenon is still murky.

Syntax, for example, is one of the levels whose findings are still inconclusive. During the production of a sentence, a speaker must select and arrange words from the lexicon. Both processes seem to become more complex in the mind of a bilingual speakers since they have to select words in accordance with the language being used and organize them according to the rules of that language. This complexity stems from the fact that, as illustrated in the previous section, the bilingual lexicon does not seem to be selective and the same may be true about the syntax. In other words, bilinguals may access parsing strategies from both languages as much as they access words from both languages when using only one of their languages.

In the literature several studies suggest that during L2 production, for example, there is some L1 influence (ODLIN, 1989; HOHENSTEIN et al., 2006; JARVIS; PAVLENKO, 2007) and that during the L1 production there is some L2 influence (JARVIS, 2003; HOHENSTEIN et al., 2006; SOUZA, 2014a). Hartsuiker & Pickering (2008) reported findings concerning the effect of conceptual number, which is found in languages such as Spanish, Italian, Dutch, French, but not in English. The hypothesis was that if there were an L1-to-L2 influence, Dutch-English bilinguals would display this

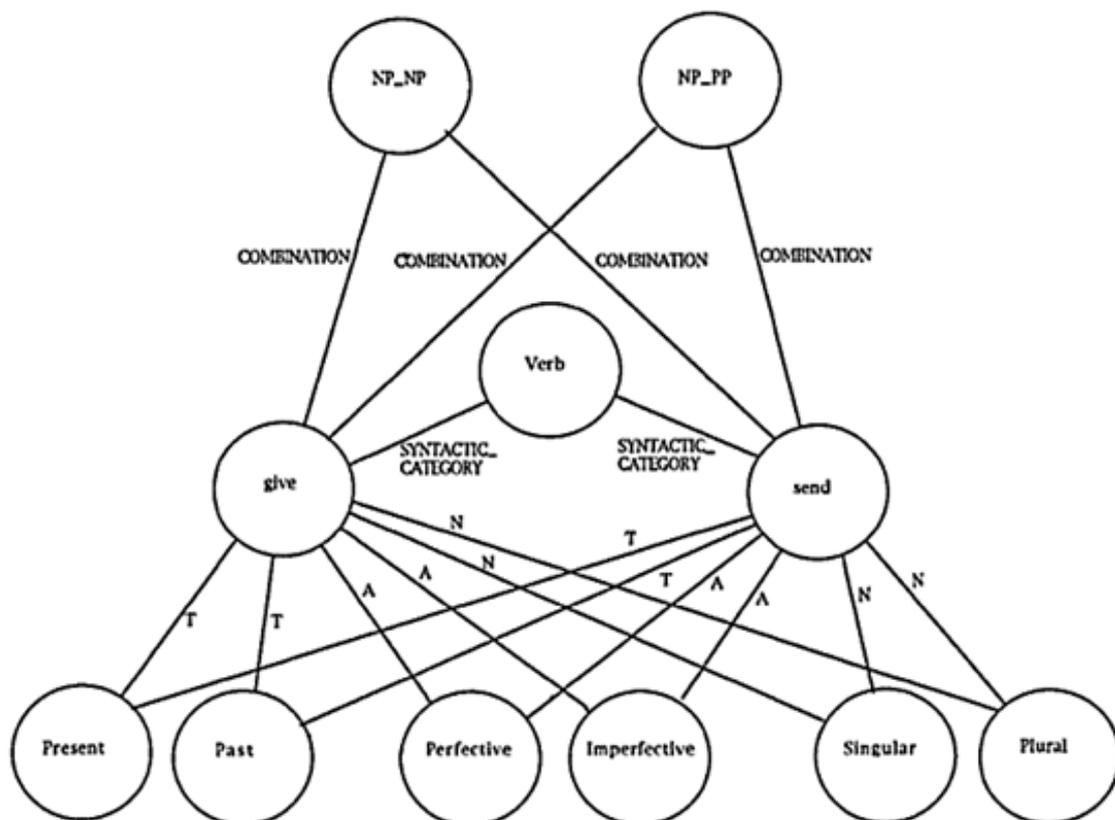
effect in the L2. According to the authors, the results suggest an effect in the L2 in the same proportion encountered in the L1.

There are studies that demonstrate that the construction utilized to express an idea in one language can be also influenced by another's rules. Hohenstein et al. (2006), for example, show that Spanish-English bilinguals, compared to English monolinguals, are more likely to use bare verbs and less likely to use manner modifiers to describe motion events in English. This behavior is consistent with the grammar of their native language and hence suggests an L1-to-L2 influence. Furthermore, compared with Spanish monolinguals, bilinguals were less likely to use bare verbs and more likely to use manner modifiers to describe motion events in Spanish, which suggests L2-to-L1 influence. Hohenstein et al. (op. cit.) interpret these results as evidence of a bidirectional influence, i.e., L1-to-L2 influence and L2-to-L1 at both the structural level and the lexical level. Furthermore, the authors indicate that the L2 users appear to be in the middle of both groups of monolinguals.

All these studies have contributed to our understanding of cross-linguistic influence at the syntactic level. However, one paradigm has stood out because of the significant findings that originated from it: syntactic priming. A considerable number of studies that seek to understand the possible shared syntactic representation between languages are based on this method. Syntactic priming refers to the tendency of reproducing certain structure after being exposed to it, a behavior that reflects the complexity of syntactic processing and representation (SALAMOURA; WILLIAMS, 2007). The two latest models of bilingual sentence representation are based on findings encountered through the syntactic priming paradigm. Both are an extension of Pickering & Branigan's (1998) model of monolingual syntactic representation.

Pickering & Branigan's (op. cit.) model incorporates from previous models the idea that syntactic information is represented at the lemma¹⁰ level. Each syntactic structure is represented by only one node and all nodes are shared among different lemmas that exhibit that same structure. So whenever a verb is used, the appropriate syntactic nodes are activated. Moreover, as can be seen in FIG. 6, the authors added nodes that represent the information on the combination of nodes or, in other words, nodes that represent the possible subcategorization of verbs and constructions being used.

Figure 6 – Pickering & Branigan's (1998) model of monolingual syntactic representation.



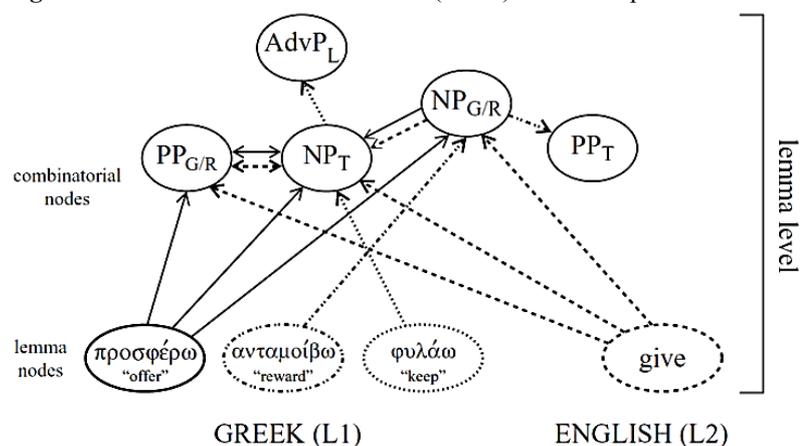
Source: Pickering & Branigan (1998, p. 635)

¹⁰ The term 'lemma' refers to the abstract conceptual form of words that contain semantic and syntactic information. Phonology, orthography and morphology are not part of the lemma; they are stored at the lexeme level.

One study that proposes the extension of the Pickering & Branigan's (op. cit.) model to include the bilingual representation system is Salamoura & Williams (2007). The authors tested Greek-English bilinguals with high proficiency in relation to structures that accepted as complements both prepositional objects and double objects. In the first experiment, it was observed that participants tended to reuse the L1 structure in the L2 production. In subsequent experiments, this trend was dependent on the combination of syntactic structure and thematic roles. Furthermore, the data shows that the priming effect was the same when the analyzed words were equivalent translations and when they were completely different words.

Based on the results, the authors proposed a bilingual shared representation model. According to the model, illustrated in FIG. 7, a combinatorial node of a language can be mapped to those of another language, at least in cases in which the languages offer equivalent structural combination possibilities for a specific category of verbs. Thus, either language can activate shared argument structure information. This model, according to the authors, has an economic representational architecture in which the information of the bilingual's languages can be used to the maximum extent possible regardless of the language being used at any given time.

Figure 7 – Salamoura & Williams' (2007) shared representation model.

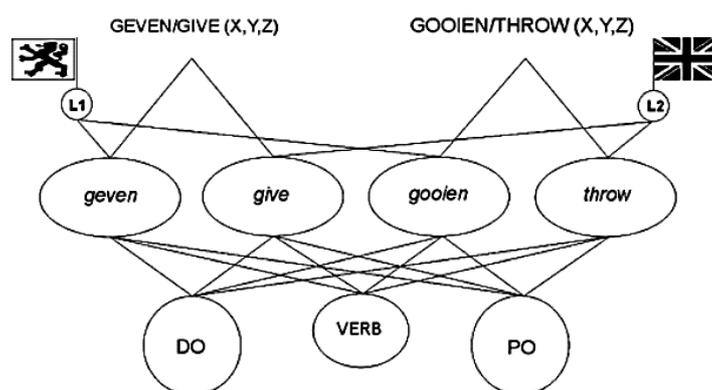


Source: Salamoura & Williams (2007, p. 652)

Another model that was proposed based on Pickering & Branigan's (1998) was the model of Hartsuiker et al. (2004). The authors also used data coming from syntactic priming experiments. The participants of their study, Spanish-English bilinguals, had to describe cards to each other in a kind of a dialogue game. The participants' tendency to use passive voice in the L2 after hearing sentences in passive voice in the L1 was compared to their tendency when not hearing the same structure. The results indicated that the bilinguals used the passive voice significantly more after hearing the same structure in the L1.

Based on the obtained results, Salamoura & Williams (op. cit.) proposed the model illustrated in FIG. 8. The lemma nodes are connected to a conceptual node, to a categorical node, to some combinatorial nodes and to a language node. This model has an integrated network with a shared lexicon and a shared syntax between languages. Thus, it is assumed that the grammar rules are shared between languages, whenever they are similar.

Figure 8 – Hartsuiker et al.'s shared representation model.



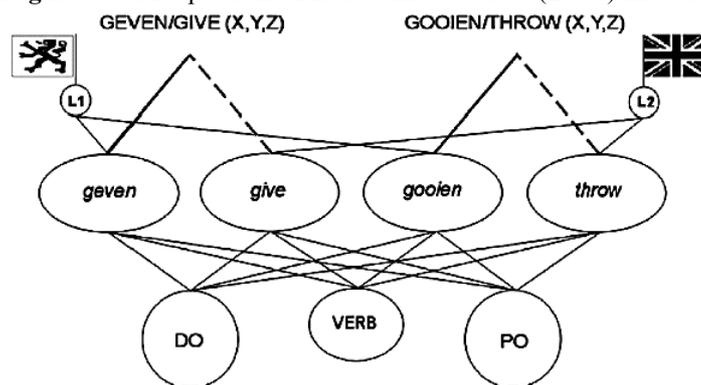
Source: Schoonbaert et al. (2007, p. 157).

According to this model, bilinguals are more likely to use a verb with a certain structure in a language after they have just processed the same structure in another

language. The model does not predict (i) priming differences between L1-to-L2 and L2-to-L1 (ii) proficiency effects or (iii) linguistic typology effects. Moreover, this model also assumes the possibility of intra-linguistic priming, since there is no difference between L1 and L2 combinatorial nodes. In such cases, the priming effect can be further increased by the repetition of verbs. Since this model assumes that equivalent translations share the conceptual level, it is possible to predict that a verb automatically activates the lemma of their equivalent translation.

Schoonbaert et al. (2007) tested Hartsuiker et al.'s (2004) model with four priming experiments on Dutch-English bilinguals. These experiments were aimed at testing L1-to-L2, L2-to-L1, L1-to-L1 and L2-to-L2 priming effects. Moreover, the authors examined if the priming effects increased when the words tested were equivalent translations. The results indicate the existence of an L1-to-L1 priming effect, with increasing effect in cases of repeated words. The same effects were found in the L2-to-L2 experiment. Similar results were also encountered in the L1-to-L2 test, but the effect of equivalent translations was not as significant as in the other experiments. Finally, the L2-to-L1 experiment yielded results that indicated priming effects, but the effect did not increase when equivalent translations were used. Therefore, the authors adapted Hartsuiker et al.'s (2004) model to include the results from their study. To this end, the authors used dotted lines to indicate the weaker connections between nodes that result in less spreading activation, as shown in FIG. 9.

Figure 9 – Adaptation of Hartsuiker et al.’s (2004) model.



Source: Schoonbaert et al. (2007, p. 165).

As one can notice, the aforementioned bilingual shared representation models show considerable similarities. They only differ from each other because, unlike Hartsuiker et al.’s (2004, adapted by SCHOONBAERT et al., 2007) model, Salamoura & Williams’ (2007) model does not account for the increased L1-to-L2 priming effect in cases where equivalent translations are used. Hartsuiker and Pickering (2008) believe that this difference is related to the fact that in Salamoura & Williams’ (2007) study they used distractors between the prime and the target sentences, which may have decreased the lexical activation.

Both Salamoura & Williams’ (2007) and Hartsuiker et al.’s (2004) models emphasize that the combinatorial nodes are shared only when the two languages have structural similarities. Bernolet et al. (2007) conducted a study with bilinguals who were native speakers of Dutch to identify if priming effects are sensitive to differences in word order. For this purpose, they analyzed priming effects from Dutch to German, languages that have the same word order and from Dutch to English, languages that have a distinct word order. The results showed priming effect only from Dutch to German, which suggests that syntactic representations are shared only between constructions involving the same word order. However, Bernolet et al. (2013) suggest that it is possible for a language-specific structure to be activated in the use of another.

Hartsuiker et al.'s model (2004) also predicts that proficiency does not have an impacting role in shared syntactic information. Bernolet et al. (2013) conducted a study with Dutch-English bilinguals with different proficiency levels to test this hypothesis. The authors used two priming experiments with sentences containing the genitive case. The results show that bilinguals with higher proficiency showed a greater priming effect, which is interpreted by the authors as evidence that bilinguals start from language-specific representations and move towards language shared representations as proficiency increases. Thus, contrary to what was previously thought, proficiency seems to have an important role in bilingual syntactic representation.

Hohenstein et al. (2006) claim that cross-linguistic influence studies focus mainly on L1-to-L2 directions, which can be noted in the studies above. However, more recently, it has been observed that L1 influence on the L2 can also be a result of the stage of maturity of bilinguals' cognitive system. According to Souza et al. (2014a), some studies suggest that the use of L1 patterns in L2 performance can be understood as a simple strategy to explore possible similarities between L1 and L2 features and not as evidence of shared-language representation. It seems reasonable that bilinguals will use their previous knowledge (L1) to acquire/develop other languages. Therefore, L1 influence on the L2 may not be sufficient evidence of a connection between languages in the bilingual mind.

L2 influence on the L1 appears in the bilingualism field as a promising solution for the investigation of cross-linguistic influence. L1 influence on the L2 performance can be defended as a simple learning strategy, but this explanation seems not to apply to the opposite case. As argued by Souza et al. (2014a), it does not seem reasonable the hypothesis that L2 influence on the L1 occurs due to the state of acquisition or to exploration about equivalence between L1 and L2 features. It is the contention of

Grosjean (2013) that L1 possible restructuring process entailed by bilingualism has not received due attention, due to the focus on L1 influence on the L2.

Only a few studies have sought to investigate the consequences of L2 knowledge on the L1. In the section below, we discuss some of them.

3.6 L2 influence on the L1

Studies about L2 influence on the L1 have already suggested that additional languages learned by a speaker can influence their L1 in aspects related to phonology, morphosyntax, lexicon, semantics, pragmatics, rhetorical and conceptual representations (PAVLENKO, 2003). As contended by Dussias & Sagarra (2007), if the L2 can affect the L1 parsing strategies, theories about the parser operations should accommodate this L1 permeability. Therefore, the presence of L2 features in L1 processing, representation and production can be considered striking evidence for the understanding of the intercommunication between languages, as Pavlenko (2000) emphasizes.

Some studies have investigated this topic, but as Birdsong (2009) notices, evidence about L2 influence on the L1 is not as robust as evidence about L1 influence on the L2. However, Li (2013) asserts that recent research suggests that the L1 of a speaker is more permeable than it was traditionally thought, to the extent that L2 influence on the L1 does not exist only in cases in which the L2 was learned early in life but also in cases of late learning.

Among the studies that address L2 influence on the L1 representation and metalinguistic awareness, we can highlight Cook et al. (2003), Balcom (2003) and Souza et al. (2014), all studies in which the bilingual participants were dominant in their L1. Cook et al. (2003) point out studies whose results suggest that attachment preferences in

Spanish relative clauses could vary if the speaker spoke English as L2. The authors conducted also a study that showed that Japanese, Spanish and Greek speakers who spoke English as L2 showed different behavior, compared to monolinguals of their native languages, with regard to which NPs in a sentence were interpreted as subjects of the tested sentences. Interestingly, the bilinguals' performance in the L1 differed from the monolinguals' in a manner that was unpredictable from L2 rules. Thus, the author interprets the results as (i) a possible reduction of security in the L1 processing routines and (ii) a possible increase in attention to categories that had not yet been found in the L1. The authors point out that such aspects corroborate the argument that bilinguals have a keener metalinguistic awareness in comparison to monolinguals.

Other studies suggest the existence of L2 influence on the L1 in a manner that is predictable by L2 rules. Balcom (1995) conducted an AJT in which it was observed that French-English bilinguals, compared to English monolinguals, behaved differently towards certain structures. In a subsequent study, Balcom (2003) compared the performance of French-English bilinguals and French monolinguals in an AJT. All the bilinguals had French as their dominant language. The obtained data indicates that L2 users were significantly more likely to reject sentences that are grammatical in the L1, but ungrammatical in the L2. Whereas most monolinguals considered the sentences grammatical, most bilinguals considered them ungrammatical. These results are in accordance with other studies cited by Balcom (op. cit.) and others cited by Cook (2003) that showed that bilinguals behavior in the L1 can be driven by the L2 grammar.

Souza et al. (2014) explored how the induced movement alternation (85) and the resultative construction are perceived by BP-English bilinguals in comparison to BP monolinguals. For that purpose, they used an AJT with the magnitude estimation paradigm.

85. The trainer jumped the lion through the hoop.

(SOUZA, 2012, p. 231)

Due to the fact that both constructions are not licensed in BP, it was necessary to create sentences that forced them into this language in a proper manner. The sentences that forced the induced movement alternation had a pattern similar to (86) and the sentences that forced the resultative construction had a pattern similar to (87). The results of both experiments indicate that the BP-English bilinguals with high proficiency accept these structures significantly more than BP monolinguals do. The results are interpreted as possible evidence of bilingualism effects on the L1 since they suggest that L2 users can deviate from L1 rules through an apparent suspension of restrictions that typically generate a rejection by monolinguals.

86. *O domador pulou o leão pela argola.*
DET tamer jump(PST) DET lion through(DET) hoop
'The tamer jumped the lion through the hoop.'

87. *Dois clientes reclamaram que a mesa estava molhada, então o garçom
Two clients complain(PST) that DET table be(PST) wet, so DET waiter
a esfregou seca.
it wipe(PST) dry.
'Two clients complained the table was wet, so the waiter wiped it dry.'*

It is important, however, to note that the reported difference between bilinguals and monolinguals, despite their significance, is not as robust as the ones encountered by Balcom (2003). In fact, both groups gave acceptability ratings to the target sentences that did not indicate high acceptability in the L1 for these constructions that are licensed only

in the L2. Thus, these findings are still inconclusive in regards to the possibility of L2 influence on acceptability judgments in the L1.

Souza (2014a) performs a subsequent study in order to examine whether bilingual speakers have access to L2 syntactic representations during L1 production. More specifically, the author conducted an experiment based on the regeneration hypothesis in order to analyze high-proficient BP-English bilinguals' and BP-monolinguals' behavior recollecting/reproducing induced movement alternation sentences in BP. The results indicate that bilinguals outperformed monolinguals in this task. The author concludes that it is possible to predict L2 effects on the L1 during the recollection/ reproduction of L2 specific constructions when the linguistic system architecture enables shared representations.

Most evidence from L2 influence on the L1 comes from studies that investigate immersed bilinguals who are frequently prone to dominance inversion and L1 attrition. Attrition can be understood as “a non-pathological decrease in performance in a language that was previously acquired by an individual¹¹” (FERRARI, 2010, p. 14). Nevertheless, the results reported in Cook et al. (2003), Balcom (2003) and Souza et al. (2014) are crucial for demonstrating the existence of these effects in non-immersed bilinguals. These results suggest an influence of the non-dominant language on the dominant language, which is a strong evidence of intercommunication between the L1 and the L2.

The results from these offline studies, however, are still inconclusive. Cook et al. (2003) indicate that bilinguals differ from monolinguals in a manner not predictable by L2 rules. However, Balcom (2003) point out that bilinguals differ from monolinguals in their L1 in a way that is in fact predictable by L2 rules. Souza et al. (2014) suggest that bilinguals differ from monolinguals in a manner predictable by L2, but their mean

¹¹ My translation. Original: a redução não patológica no desempenho em uma língua que fora adquirida anteriormente por um indivíduo (FERRARI, 2010, p. 14).

difference is rather small. Therefore, it seems that the L2 plays a role in bilinguals' behavior in the L1 during offline tasks, but the specificities of this influence are still unclear.

Other studies have focused on L2 influence on online processing of the L1. The resolution of ambiguities in relative clauses is a phenomenon that has received much attention in studies focusing on sentence processing, particularly because there is strong evidence that the attachment preferences in relative clauses can vary in each language (CUETOS; MITCHEL, 1988). Consequently, some researchers have investigated bilinguals' attachment preference in order to shed light on cross-linguistic influence effects. (FERNANDEZ, 2003; DUSSIAS; 2003; DUSSIAS; SAGARRA, 2007).

One study on this topic is Dussias & Sagarra (2007), who conducted an eye-tracking experiment to analyze how Spanish monolinguals (group 1), Spanish-English bilinguals with limited immersion experience (group 2) and Spanish-English bilinguals with extensive immersion experience (group 3) read sentences with temporarily ambiguous relative clauses. More specifically, the authors sought to examine whether these groups favored high or low attachment for sentences like (88). The results indicated that the two first groups tended to attach the relative clause to the first NP, whereas group 3 did it to the second NP. The authors interpret the results as evidence for models that incorporate statistical frequency as an important variable in a cognitive architecture.

88. *El policía arrestó a la hermana del criado que estaba*
DET police arrest(PST) PREP DET sister of(DET) maid that be(PST)
enferma desde hacía .tempo.
sick since do(PST) time.
'The police arrested the sister of the maid who had been sick for a while'

There are results, however, that point to the opposite direction. Clahsen & Felser (2006), for example, argue that the mechanisms responsible for carrying out the semantics-syntax mapping are different for each of the bilingual's languages. Furthermore, the authors point out that there is little evidence of L2 influence on the L1 concerning the comprehension system. Interestingly, the authors support this argument with evidences from studies on ambiguous relative clause attachment preferences. These results concerning relative clauses demonstrates that L2-to-L1 influence on linguistic processing is still a question open to debate.

Hohenstein et al. (2006) suggest that L2 influence on the L1 seems to be motivated by cultural factors, as they seem to occur more often with bilinguals living in contexts where L2 is the dominant language in social interactions or in contexts of simultaneous bilingualism. In most of the studies we have described in the previous sections, the bilingual population under scrutiny is either immersed in the L1, or in the L2 environment. Consequently, the precise role of immersion remains unclear. This comparison is important in order to understand the factors that can trigger bilingualism effects on the L1. In the present study, we will compare bilinguals that are highly proficient, but vary in whether they are immersed in the L1 or the L2

Souza (2012) argues that the first studies on L2-to-L1 influence were related to linguistic attrition, which is a common phenomenon in cases of dominance inversion. Ferrari (2010) argues that in the absence of L1 input, the L2 can become a source of indirect positive evidence. If we take into consideration the other studies discussed in this section that demonstrate non-dominant L2 influence on a dominant L1, the L2 appears to be a source of indirect positive evidence even in cases where there is continued input in the L1. This observation is consistent with Schmid & Köpke's (2008) idea that linguistic attrition is only the tip of the bilingualism iceberg. According to the authors, the subtlest

effects of the L2 on the L1, which probably all bilinguals experience, remain below the waterline and cannot be detected except by psycholinguistic and neurolinguistic investigations.

There is other information about the language attrition process that seems to be consistent with non-immersed bilinguals showing possible L2 influence on the L1. According to Ferrari (2010), the attrition's initial process is observed mostly in high-proficient bilinguals. In Souza (2012), L2 effects on the L1 are also more clearly seen in L2 users with higher levels of proficiency. In our study, we will also analyze the behavior of this bilingual profile.

To summarize, the topic of L2 influence on the L1 both at the level of syntactic representation and processing is still inconclusive. In order to shed light on this issue, we will conduct online and offline experiments that provide data about the behavior of highly proficient BP-English bilinguals (immersed either in the L1 or in the L2) towards the resultative construction in the L1.

Besides the effects of the L2 on representation and processing in the L1, linguists and psycholinguists in the field of bilingualism are also interested in comprehending the processes involved in the acquisition of L2 and the differences between bilinguals' L2 knowledge in comparison to that of monolinguals. These topics are discussed in the following section.

3.7 Learnability

Learnability in the acquisition of argument structure has been studied since the 1970s in regards to first language acquisition, but only in the 1990s it started to be the focus of SLA researches, as shown by Joo (2003). The acquisition of argument structure

in the L1 draws lots of attention due to the fact that speakers are able to learn several syntactic constraints with apparently little negative evidence. The event-argument homomorphism present in the resultative construction is an interesting example of a subtle restriction that is learned by the native speakers of English (OLIVEIRA, 2014). Joo (op. cit.) argues that this learnability issue seems to be even more complicated in L2 acquisition due to variables such as L1 influence, proficiency levels and learning contexts.

In order to explain some of the features present in L2 acquisition, Amaral & Roeper (2014) propose the concept of Multiple Grammars (MG). The authors argue that the acquisition of L2 rules does not require changes in bilinguals' L1 grammatical knowledge. Instead, the authors claim that the bilingual grammar is capable of accommodating all rules. The initial state of L2 acquisition is based on the knowledge of the L1 and, hence, the L2 will tend to rely on L1 properties. As bilinguals receive input from the L2, they will eventually deal with the L2 rules that are similar and others that are different from, the L1 rules. The authors assert that bilinguals develop sub-grammars to accommodate all of these rules in an integrated representational system and they use linguistic cues in order to evaluate which sub-grammars are more productive in each language.

In this approach, the L1 and the L2 can differ from one another in regards to which sub-grammars are more productive. By way of illustration, we can consider the acquisition of the resultative construction by BP-English bilinguals. As discussed in section 2.4, a sentence with a resultative structure in BP is perceived either as a depictive construction (89) or as an ungrammatical sentence (90). Therefore, at the first stage of L2 acquisition, these bilinguals are expected to consider English resultative sentences to be either depictive, or ungrammatical. As their learning process advances and the resultative construction becomes more common in the input, bilinguals will start acquiring the

correct syntactic-semantic mapping for the resultative construction. Consequently, as proposed by the Multiple-Grammars perspective, bilinguals will have sub-grammars with BP rules and other sub-grammars with the English rules. As bilinguals' L2 acquisition progresses, they will enhance their ability to specify which sub-grammar is more productive in which language.

89. Samuel esfregou o carro limpo.
Samuel wipe(PST) DET car clean
'Samuel wiped the clean table.'
90. *Samuel molhou o carro e o esfregou limpo.
Samuel wet(PST) DET car and it(ACC) wipe(PST) clean
'Samuel wet the car and wiped it clean.'

Interestingly, the MG model is not restricted to bilingual representation. The accommodation of contradictory rules also occurs within a single language. Monolinguals, for example, also have to accommodate contradictory rules that exist in different registers/ varieties of their language. Actually, according to Roeper (1999), the existence of incompatible sub-grammars in a language is one of the sources of different kinds of variations perceived within a language. Therefore, bilinguals are capable of storing rules that are contradictory both cross-linguistically and intra-linguistically.

Overall, the process of L2 acquisition involves the addition of new rules in the speakers' grammatical repertoire and the (re)assessment of these rules' productivity. Thus, we understand that the MG perspective suggests that highly proficient bilinguals do not delete L1-specific rules from their L2 representation. Instead, those bilinguals accommodate both rules in a single representation system (sub-divided into sub-grammars), but they are able to assign to each of their languages the most productive and appropriate sub-grammars.

This proposal raises hypotheses for differences between bilinguals and monolinguals that are compatible with the Multi-Competence perspective, discussed in section 3.2. The optionality¹² of different sub-grammars in the bilingual mind can be what will ultimately differentiate bilinguals from monolinguals of both the L1 and the L2. The MG assumes that optionality is what seems to define the grammar of L2 users from the initial phases until stable/final attainment phases. Also, uncertainty about the degree of productivity of each sub-grammar is one of the possible reasons for cross-linguistic influence. In sum, bilinguals are likely to have more sub-grammars than monolinguals from both the L1 and the L2 do and, even though, they may behave like monolingual native speakers in certain circumstances, their grammar will always differ from monolinguals’.

Another aspect of interest in studies on learnability in SLA is the limits of bilingualism. A plethora of studies suggests that certain structures of an L2 seem to be more difficult to learn through mere exposure (BRAIDI, 1999; DEKEYSER, 2005; ELLIS, 2008; SORACE; FILLIACI, 2006; SLABAKOVA, 2014; OLIVEIRA, 2014; OLIVEIRA; NOGUEIRA, 2016). DeKeyser (2005) argues that this difficulty is caused by lack of frequency and saliency, especially where syntactic-semantic mapping is concerned. However, Braidi (1999) demonstrates that even a simple and frequent structure, such as the English negative, may require speakers to pass through certain developmental stages in order to be fully acquired. The fact that certain aspects of a language are more difficult in L2 acquisition than in L1 acquisition makes one question if bilinguals are indeed capable of acquiring all the features of the L2. More importantly,

¹² Optionality is “the simultaneous existence in a single speakers’ grammar of two or more features, (where) each of which should normally exclude the other.” (TRUSCOTT, 2006 apud AMARAL; ROEPER, 2014, p. 24)

this contrast in learning processes also generates a debate about which aspects of the L2 exactly are harder to be attained.

The Subset Principle (OKAMOTO, 2009) was one of the first theoretical frameworks that proposed an explanation for the different costs of different structures in L2 acquisition. It assumes that the differences in ease or difficulty to acquire an aspect of L2 involves linguistic typology. According to this proposal, the L1 can be a superset or a subset of the L2 and vice-versa. The language that has a more restrictive grammar is the subset and the one with a more expanded grammar is the superset. It is important to note that a language can be a subset in relation to certain aspects of the grammar and a superset in relation to other aspects.

Taking into consideration the constructions discussed in section 2.1, we can assert that BP is a subset of English (or English is a superset of BP) in regards to the sequence NP-VP-NP-AP. English, on the one hand, licenses at least four constructions with this syntactic pattern, namely the resultative, the pseudo-resultative, the depictive and the small-clause constructions. BP, on the other hand, licenses the pseudo-resultative, the depictive and the small-clause constructions, but not the resultative construction. Hence, the grammar of BP is more restrictive than the grammar of English is in relation to the aforementioned syntactic sequence.

The Subset Principle proposes that learnability will vary according to the direction of the process (subset \rightarrow superset or subset \leftarrow superset). The prediction is that departing from a subset grammar towards a superset grammar is easier than the other way around. In other words, the model assumes that expanding (subset \rightarrow superset) is easier than contracting one's grammar (subset \leftarrow superset). Thus, with regards to the structure NP-VP-NP-AP, the model predicts that BP-English bilinguals will learn the resultative syntactic-semantic mapping in English more easily than English-BP bilingual will learn

the unavailability of such mapping in BP. The rationale is that in the first context, bilinguals will be favored by the input, which will naturally indicate the existence of this syntactic-semantic mapping. In the second context, dissimilarly, bilinguals will have to learn that a structure that they already know is unavailable in the L2. This second context is more problematic, according to Okamoto (2009), because the L2 input confirms the availability of L1 structures in the L2, but it does not provide the evidence that some constructions in the L1 are impossible in the L2.

This model, accordingly, predicts that BP-English bilinguals will acquire the resultative construction. This acquisition will be a natural result of bilinguals' cumulative experience with their L2, which will expose them to the hitherto-unknown syntactic-semantic mapping options. This contact will be enough for the BP-English bilinguals to expand their knowledge about the NP-VP-NP-AP pattern and apprehend the new AP interpretation.

Previous studies have corroborated the Subset Principle with empirical evidence. Inagaki (2001), for instance, conducted a bi-directional study analyzing the acquisition of English by Japanese speakers and the acquisition of Japanese by English speakers. The study consisted of an AJT and focused on manner-of-motion verbs (walk) and directed motion verbs (go). In this case, Japanese is a subset of English, because the two languages license directed motion verbs with PP indicating a goal, but only English licenses manner-of-motion verbs in the same context. The results indicate that, on the one hand, Japanese-English bilinguals expanded their grammar and behaved like English native speakers, accepting in the L2 the structure unlicensed in the L1. On the other hand, English-Japanese bilinguals, as opposed to native speakers of Japanese, failed to reject the sentences that are licensed in their L1, but not in their L2. Therefore, as predicted by the subset principle, bilinguals departing from a subset towards a superset grammar learned

the L2-specific property and the bilinguals going in the opposite direction overgeneralized their L1-specific property to the L2.

Another study with BP-English bilingual participants corroborates the predictions of the Subset Principle. Oliveira & Nogueira (2016) conducted a translation test in which the authors observed BP-English bilingual participants' behavior when translating sentences that started with a "since + period of time phrase" and described a present routine. BP and English differ grammatically in relation to the tense licensed to describe this type of sentence, as we can observe in (91)-(96). English does not license the simple present tense to describe this type of event, but BP does. Oliveira & Nogueira (op. cit.) tested how BP-English bilinguals translated sentences such as (94) to English. The results indicate that low proficiency speakers (80%) tended to use the simple present tense in English and high proficiency speakers used both the simple present (37%) and the present perfect (63%). Therefore, the results indicate that bilinguals learn to use the correct tense, but they do not fully learn that the tense licensed in the L1 is illicit in the L2.

91. *Since I moved to Europe I study French.
92. *Since I moved to Europe I am studying French.
93. Since I moved to Europe I have studied French.
94. Since I moved to Europe I have been studying French
95. *Desde que eu mudei para a Europa eu estudo Francês.*
Since that I move(PST) to DET Europe I study French
'Since I moved to Europe I study French.'
96. *Desde que eu mudei para a Europa eu estou estudando Francês.*
Since that I move(PST) to DET Europe I be studying French
'Since I moved to Europe I am studying French.'

Other studies have encountered different patterns. Ayoun (1996) provide some evidence that only partially favors the Subset Principle. The author analyzed whether English-French bilinguals acquire the unavailability, in the L2, of structures that are present in the L1, namely the Exceptional-Case Marking, the preposition stranding, dative alternation and the dative passive. Learning these structures requires movement from a superset towards a subset grammar. As predicted by the Subset Principles, learners failed to reject sentences that instantiated the dative alternation and the dative passive, which led them to an overgeneralized grammar. However, they did not fail to reject the instances of Exceptional-Case Marking and preposition stranding.

Slabakova (2006) tested the Subset Principle by analyzing English-Italian and Italian-English bilinguals' acquisition of bare nouns' semantic properties. Both languages are syntactically identical in that respect but differ in terms of possible interpretations. In this case, English is the superset and Italian is the subset since the former licenses two interpretations for bare nouns (generic and existential) and the latter only one (existential). The Subset Principle predicts that it is easier for native speakers of Italian to acquire the other available interpretation in English than for native speakers of English to exclude one interpretation when acquiring Italian. However, the results indicate that the acquisition of bare nouns semantic properties is successful in both directions. Thus, these two studies suggest that not all structures that are learned through the contraction of a superset grammar are unlikely to be acquired.

The Interface Hypothesis (SORACE; FILLIACI, 2006) originally suggested that structures with an interface between syntax and other cognitive domains would be less likely to be learned. The more recent versions of the aforementioned hypothesis (SORACE; SERRATRICE, 2009; SORACE, 2011) assumes that the interfaces that are harder to acquire are those that involve the interface between internal and external aspects

of the grammar with external aspects, such as the syntax-pragmatics interface. In other words, the Interface Hypothesis predicts that properties that involve only sub-modules of language are more easily acquired than those involving cognitive domains out of core computational system are. Hence, structures that involve interface of syntax and semantics, such as the resultative construction, are not assumed to be difficult for bilinguals to learn. The Interface Hypothesis also predicts that constructions with syntax-pragmatics interfaces are more likely to undergo changes in processes of attrition¹³. This argument comes from studies whose results suggest that long and intensive exposure to the L2 can lead to a loss in access to L1 representational repositories.

Sorace & Filiaci (2006) tested the behavior of English-Italian bilinguals in relation to linguistic phenomena involving the syntax-pragmatics interface. More specifically, they analyzed the preferred interpretation for null and overt pronouns in embedded clauses. Monolinguals and bilinguals exhibited similar preferences in regards to the interpretation of null subjects, but they differed significantly in relation to the interpretation of overt pronouns: L2 users linked overt pronouns to the subject in the matrix clause considerably more often than monolinguals did. Pacheco & Flynn (2006) analyzed whether BP-English bilinguals acquire the pragmatic factors related to the syntax of null and overt subjects and objects. Their findings suggest that the bilinguals' seem to have fully acquired L2 syntactic properties related to subjects and objects, but not the pragmatic properties. That being the case, these results are in accord with the predictions of the Interface Hypothesis that L2 users will show some difficulty acquiring aspects of the interface between syntax and other cognitive domains.

The assumptions of the Interface Hypothesis are not uncontroversial. Slabakova & Ivanov (2011), for example, compared the results of two comprehensive studies on the

¹³ For more information on language erosion, see Köpke & Schmid (2004) and Schmid & Köpke (2008).

properties of syntax-discourse interface properties. The two studies investigated bilinguals' acquisition of clitic left dislocation as a marker of topicality in two different L2s (Spanish and Bulgarian). According to the authors, when scrutinized carefully, the two studies reveal that external interfaces does not look very different from internal interfaces.

Slabakova (2014) also addresses the limits of bilingualism in the Bottleneck Hypothesis. According to the author, findings on the acquisition of different features of the L2 suggest that the acquisition of syntax, semantics and pragmatics in the L2 occurs smoothly, but functional morphology poses some challenges to bilinguals because it is where most (cross)linguistic variation is encoded. This variation reflects the fact that functional morphology is responsible for encoding the formal features of the grammar, a characteristic that results in its higher cognitive load in processing.

Carneiro (2011) investigated the behavior of BP-English bilinguals towards errors in functional morphology in the L2. Two self-paced readings (SPR) were conducted with highly and low proficiency bilinguals in order to test their sensitivity errors of past (-ed) and present (-s) verbal morphology. The results, in accordance with the predictions of the bottleneck hypothesis, indicate that L2 users are not sensitive to violations in functional morphology as native speakers are. Those results are, in fact, very interesting since they suggest that an aspect of the L2 that is frequently encountered in the input and vastly discussed in formal contexts of learning does not seem to be fully acquirable by bilinguals.

Botero (2016) also provides some evidence in favor of the Bottleneck Hypothesis with a study on English-Spanish bilinguals' acquisition of the compound form of the pluperfect subjunctive to express counterfactual meaning in the past through conditional clauses. The results of the study's two experiments indicate that English-Spanish

bilinguals exhibit difficulty with morphological recognition, but not with semantic and pragmatic knowledge. Therefore, her results favor the Bottleneck Hypothesis to the detriment of the Interface Hypothesis.

In conclusion, it remains an open question to what extent the (late-learned) L2 can be fully acquired. Nevertheless, the studies and proposals reviewed here give no reason to think that BP-English bilinguals cannot fully acquire the English resultative construction. The Subset Principle predicts difficulty in acquiring aspects of the L2 that require contraction of grammar, but the acquisition of the resultative construction entails expansion of the grammar. The Interface Hypothesis predicts that it will be hard for bilinguals to acquire linguistic aspects which contain an interface between internal and external features of the grammar, which is not the case of the resultative construction, whose interface is between syntax and semantics. The bottleneck hypothesis suggests that bilinguals will struggle to attain knowledge of functional morphology, but the acquisition of the resultative construction is not dependent on such knowledge. As a result, there seems to be no reason to predict that BP-English bilingual will not be able to build a sub-grammar with the resultative construction features and correctly assign it to their L2.

The acquisition of the resultative construction by BP-English bilinguals has been studied previously. Using an AJT with the magnitude estimation paradigm, Oliveira (2013) observed that highly proficient BP-English bilinguals judge the acceptability of the resultative construction similarly to the way English monolinguals do. In accordance to what the Multiple-Grammars predicts, bilinguals with lower proficiency seem to resort to their L1 grammatical knowledge and, consequently, they give lower acceptability ratings to the resultative construction. In this study we will also investigate the acquisition of the resultative construction, but, as opposed to the previous studies, we will analyze the behavior of bilinguals in a Maze Task (MT) and in a Speeded Acceptability Judgment

Task (SAJT) in order to evaluate if the resultative construction is part of their implicit and stable knowledge of the L2.

Oliveira (2014) also proposes an extension of the Subset Principle. According to the Subset Principle, bilinguals are less likely to learn the unavailability of structures present in their L1. Oliveira (op. cit.) expands the scope of the principle and propose what we will name the Negative Evidence Hypothesis (NEH). This hypothesis predicts that any L2-specific property whose acquisition is dependent on negative evidence will be less likely to be acquired if such evidence is not provided. Therefore, not only the restraining of previous grammatical knowledge but also the L2-specific restrictions of properties that are not available in the L1 will be difficult for bilinguals to acquire.

The rationale of NEH is similar to the Subset Principle one: there is no positive evidence in the input as to the unavailability of the missing structure. It seems that L2 users do not rely on indirect negative evidence as much as native speakers do. In other words, bilinguals appear to use the absence of evidence as evidence of absence less than monolinguals do.

This hypothesis is related to the nature of bilingualism itself. Bilinguals frequently have to deal with new grammatical structures in the L2 and they have to find what the correct syntactic-semantic mapping is, whereas monolinguals are less likely to deal with completely new grammatical structures. Consequently, when dealing with a new structure, bilinguals are more likely to assume it is correct and to try to find its most suitable interpretation as compared to monolinguals. If this new structure is ungrammatical, bilinguals are not as likely as monolinguals to perceive it as so. It is worth mentioning that we are not assuming a difference between monolinguals and bilinguals at the processing level. The NEH suggests that monolinguals and bilinguals differ mainly in terms of metalinguistic awareness to restrictions. Therefore, even though an unlicensed

structure in the L2 can impose extra processing cost to both monolinguals and bilinguals, the latter is less likely to assume that this structure is unlicensed.

Another possible explanation as to why bilinguals are not as sensitive as monolinguals in regards to restrictions present in the L2 is the differences in the manner the L1 and the L2 are acquired. As discussed in section 2.1, lexicalist approaches assume that monolinguals specify each possibility of argument structure in each verb. Bilinguals, on the other hand, seem to be less likely to exhibit this bottom-up acquisition, since they already have another grammar in their mind and they usually do not have the same type and amount of input as monolinguals do. Consequently, as compared to monolinguals, bilinguals will tend to have a more top-down acquisition, which is more likely to result in overgeneralizations.

In this study, we will test the NEH by investigating if BP-English bilinguals acquire the restrictions of the resultative construction. More specifically, we will analyze if bilinguals are as sensitive as monolinguals in regards to the event-argument homomorphism discussed in section 2.3. The resultative construction is unavailable in BP, hence, the Subset Principle predicts that it is likely to be acquired by BP-English bilinguals since they would be departing from a subset towards a superset grammar. The NEH, complements the Subset Principle by adding the information that the restrictions present in the resultative constructions will be less likely to be learned by these bilinguals.

In the next section, we will describe the experiments utilized in the present study's investigation of the representation, processing and learnability of the resultative construction by BP-English bilinguals.

4. Materials, methods and results

4.1 Methods

This study is primarily focused on the analysis of possible effects of bilingualism on the L1, but it also investigates the learnability of an L2-specific argument structure. More specifically, we seek to observe how bilingualism can influence bilinguals' L1 (BP) at the levels of both processing and representation. Also, we intend to find out if BP-English bilinguals acquire the English resultative construction and its subtle restrictions in English. In order to reach this end, we used two types of experiments: the Acceptability Judgment Task (AJT) and the Maze Task (MT).

4.1.1 Acceptability judgment task (AJT)

Since the cognitive revolution in the second half of the 20th century, there is a growing interest in the cognitive processes involved in the human language faculty. The tendency that certain speakers have to accept or reject certain structures constitutes an important evidence of linguistic knowledge. Consequently, acceptability judgments have long been used in different linguistic subfields and, with the emergence of Experimental Syntax (COWART, 1997), the acceptability of sentences were adopted for use in formal experiments (SOUZA; OLIVEIRA, 2014).

Many linguistic phenomena are not readily observable in spontaneous and natural language use. In other words, the aspects we can observe in the everyday use of language do not reflect the totality of the linguistic knowledge that each speaker has (SORACE;

KELLER, 2005; SORACE, 2010). Thus, the AJT is a non-trivial alternative for the analysis of speakers' linguistic knowledge, since it can bring evidence about speakers' behavior towards sentences that are rare or absent in a given language. In this study, for instance, we analyze speakers' behavior towards ungrammatical sentences that force the true resultative construction in BP and some ungrammatical resultative sentences in English.

The term "acceptability" refers to the speakers' perception of certain linguistic units (BARD et al., 1996). It involves the interaction of several factors (SCHUTZE, 1996; SPROUSE et al., 2013.), three of which Souza & Oliveira (2014) highlight: grammaticality, representation and processing capacity. Grammaticality is a logical consequence of linguistic theory that can or cannot be consciously available to speakers. Representation is the implicit or explicit knowledge of grammar principles. Processing capacity refers to the ability to access to linguistic representation during language comprehension.

Thus, the AJT aims to test the speakers' perceptions of certain structures and not necessarily their knowledge of prescriptive grammars. Accordingly, in this study, we decided to use the term "acceptability judgment" rather than the term "grammaticality judgment", which is also widely found in the literature.

The standard procedure adopted in AJTs is relatively simple. The participants, who form a representative sample of the community under scrutiny, are presented with a set of sentences (target sentences, control sentences and distractors). Participants judge the sentences one by one by assigning them numerical values that show how acceptable, natural and well-formed they sound (KELLER, 1998; CULBERTSON; GROSS, 2009; SOUZA; OLIVEIRA 2014; SOUZA et al., 2015). Several types of scales have been used in AJT, such as a binary scale, a Likert scale and magnitude estimation. Obviously, the

suitability of each scale depends on the purpose of the study, but, in general, the Likert scale has been considered the most appropriate scale for AJTs due to its feasibility and informativeness (WESKOTT; FANSELOW, 2011; FUKUDA et al., 2012; SOUZA; OLIVEIRA, 2014).

After obtaining and organizing all the AJT data, the statistical treatment is applied. Inferential statistics procedures are conducted to analyze whether there are significant differences between the measures of central tendencies in association with the measures of dispersion. Such differences may reveal possible effects of the tested linguistic condition.

The results obtained in an AJT can reveal many aspects of speakers' linguistic knowledge. However, many factors play a role simultaneously in the participants' judgment. A participant can evaluate a sentence based on semantic, syntactic and, among others, pragmatic aspects of the sentence. In order to make the participants focus on the aspect that is relevant to a particular study, it is necessary to provide them with clear instructions and efficient training sessions.

Linguistic processing is probably one of the first aspects to exert its influence on speakers' impression towards a sentence. As participants reread sentences and reflect upon them, other factors may become more influential than the linguistic processing. Thus, to obtain acceptability ratings that somehow present greater influence of linguistic processing, one possible strategy could be to limit the exposure to each sentence. This timed procedure is usually called Speeded Acceptability Judgment Task (SAJT).

Souza et al. (2015) investigated the ideal time ceiling for SAJTs with a 5-point Likert scale. The results indicated that with only 4 seconds monolinguals are able to judge, in their native language, a sentence with about 40 characters. This time ceiling imposition not only increases the influence of linguistic processing but, according to Ellis

(2005), it can also enable the judgment to capture speakers' implicit knowledge. In our study we will use both the untimed and the speeded versions of the AJTs.

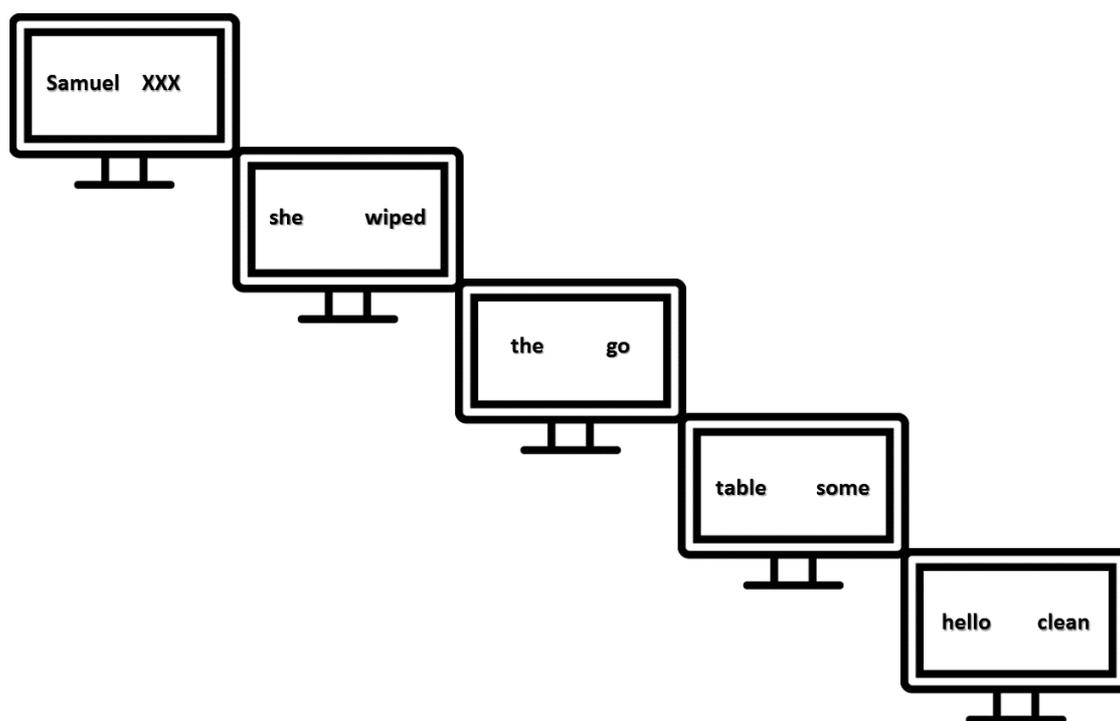
Below we present another method that will be used in the present study: Maze-Task (MT).

4.1.2 Maze task (MT)

It has been argued that psycholinguistic methods that involve reading should be as accurate as possible in indicating the processing cost of different linguistic units and as close as possible to natural reading (MITCHEL, 2004). However, we understand that a method must have its quality evaluated according to the nature of the study to which it is being applied. For our study, for instance, the most important characteristic is the method's capacity to indicate the processing cost of each component of a sentence. Therefore, it is our contention that reading naturalness does not hold a central role in our investigation.

Due to the necessity of measuring the processing cost generated by a specific word in the target sentences, we opted for a paradigm capable of forcing incremental processing, namely the MT. This task is similar to the self-paced reading (SPR) technique with respect to the word-by-word stimuli presentation. However, unlike the SPR, after the presentation of the first word, the MT offers a choice between two words, only one of which is grammatically acceptable to complete the sentence being formed. Participants are instructed to choose the word that best suit the sentence being built as quickly and accurately as possible. The sentence "Samuel wiped the table clean", for example, would be presented as in FIG. 10.

Figure 10 – A sample Maze-Task sentence, frame by frame.



The fact that the words are displayed in pairs and only one option can correctly fit in the sentence is different from the typical reading process. In other words, in this type of task, the stimuli presentation does not simulate natural reading. Thus, such a task would not apply to studies that seek to investigate the reading process itself. However, this strategy favors the ability to observe processing costs for integrating words into a sentence, since the task forces the reader to adopt an incremental processing strategy in which each word should be fully integrated with the previous context before the next word can be considered (FORSTER et al., 2009). Therefore, it is argued that the MT has the potential to provide localized processing cost information during online sentence comprehension (WITZEL et al., 2012). Obviously, the task does not indicate the exact cost of processing, but it can point out processing cost differences between words in a robust manner. In sum, this method suits this study because it can demonstrate differences

in the integration of the words "clean" and "angry", for example, in the comprehension of sentences such as (97)

97. Samuel set the table and wiped it clean/ angry.

The MT has a number of advantages over other methods used to investigate linguistic processing. Different from what is observed in the eye-tracking or the SPR, for example, spillover effects are not expected during a MT. In other words, it is unlikely that the processing cost of an item appears in subsequent words. Thus, there is greater reliability in relating the reading time of a word with its processing cost. Moreover, according to Forster et al. (2009), the fact that the task cannot be performed unless the sentence is understood makes comprehension questions unnecessary for the experiment. Finally, participants cannot have a general idea of the sentence before processing it completely, which favors the understanding of how each word is integrated.

Witzel et al. (2012) compared three techniques, SPR, eye-tracking and MT, in order to observe their differences. More specifically, the authors examined whether each of these methods was able to indicate distinctions in the processing of sentences with relative clauses containing temporary ambiguities. Also, the authors investigated whether these effects were perceptible in the intended area. The results suggest that only the MT was able to provide robust located indications of processing difficulties. Therefore, Witzel et al. (2012) support the methodology chosen for this study.

4.2 The experiments

Before performing the experiments, the bilingual participants took the Vocabulary Levels Test or VLT (NATION, 1990) (APPENDIX A) in order to measure their proficiency in English. Previous studies have demonstrated that the resultative construction is part of the grammar of bilinguals who had achieved the highest levels of the VLT (OLIVEIRA, 2013). Bilinguals with lower levels in the VLT, according to the same results, may not have mastered such construction. Accordingly, only bilinguals who have achieved the highest level of the VLT will take part in this study since we are interested in understanding the characteristics and entailments of the acquisition of the resultative construction. Hereinafter, in order to describe our experiments, we will refer to these speakers simply as “bilinguals”¹⁴.

The VLT is a word association test, in which participants link words to their respective meanings. The assumption underlying this screening criterion is that levels of competence in L2 lexical access are related to levels of proficiency in that language. Participants’ lexical competence is divided into five levels that reflect access to lexical items whose frequency decreases progressively in corpora of English. It is assumed that access to low-frequency words is a behavioral trait, which reflects the size of the L2 mental lexicon. The VLT has proven to be very efficient in separating high proficiency from low proficiency bilinguals (SOUZA; SILVA, 2015). In order to enhance the test discriminatory effect in our test, the VLT was performed with a 10-minute time ceiling.

In the first experiment (henceforth experiment one), we conducted an online AJT in order to illuminate the best structure to force the true resultative construction into BP. More specifically, we aimed at checking which pronominal form should be used in the

¹⁴ The VLT suggests that these bilinguals know more than 10000 lexemes in the English language.

target items: 3rd person tonic pronouns or 3rd person clitic pronouns. The pronouns that best fit the depictive construction, which is licensed in BP, were used in the next experiments' stimuli. Taking into account that the ultimate goal of this study was to analyze the participants' behavior towards the resultative construction, it was important for the tested structure not to contain others aspects that could be as influential as the construction itself. Also, the literature is divergent about which direct object pronoun best suit psycholinguistic experimental items, as shown Maia & Cunha (2014).

The second experiment (henceforth experiment two) explored the functioning of the BP-English bilinguals' parser when processing sentences that forced the resultative construction into BP. More specifically, in this experiment we focused on the processing cost of the resultative predicate. We compared the behavior of three types of speakers (non-immersed BP-English bilinguals, immersed BP-English bilinguals and BP monolinguals) in relation to both the resultative and the depictive construction. We selected the MT for this purpose due to its power to show the processing cost of each word in a sentence locally.

The third experiment (henceforth experiment three) addressed BP-English bilinguals' perception of the resultative construction in BP. The participants were the same from experiment two and the method was the SAJT. The imposition of a time ceiling aimed at enhancing the influence of processing in this offline method. The target items were also instances of the resultative and the depictive construction, but the sentences were different from those in experiment two.

The fourth experiment (henceforth experiment four) aimed at testing the validity of experiment three. The participants in experiment three performed the SAJT right after they took the MT in experiment two. Hence, the participants may have been influenced by the fact that they had dealt with the target structures previously. Thus, experiment four

was a replication of experiment three with participants who had not performed any task whose target structure was either the resultative or the depictive construction. The results suggest that participants' behavior on the AJT was not biased due to their previous participation on the MT. Therefore, we repeated this strategy in experiments five and six.

The fifth experiment (henceforth experiment five) was designed to analyze how bilinguals process the resultative predicate in English. To that end, we conducted a MT similar to the one in experiment two. The purpose of this experiment was to understand if the resultative construction was part of bilinguals' implicit knowledge, by measuring the processing costs imposed by the resultative predicate. Also, we inspected if the ungrammatical resultative sentences imposed extra processing costs due to the violation of the event-argument homomorphism. We compared the behavior of three types of speakers (non-immersed BP-English bilinguals, immersed BP-English bilinguals and English monolinguals) towards three groups of sentences (depictive, resultative and ungrammatical resultative).

Finally, the sixth experiment (henceforth experiment six) was intended to yield information on bilinguals' perception of the resultative construction in English. A SAJT, similar to the one in experiment three, was conducted to that aim with participants from experiment five. Once again we considered the behavior of three types of speakers (non-immersed BP-English bilinguals, immersed BP-English bilinguals and English monolinguals) towards three groups of sentences (depictive, resultative and ungrammatical resultative), which were different from those in experiment five.

This study also allows us to compare the data yielded by different methods. In previous studies on the representation of the resultative construction, the AJTs were conducted without a time limit for the presentation of each item (OLIVEIRA, 2013). Thus, the comparison between the data from previous studies with the data from

experiment three, four and six generates information on the differences between the standard and the speeded version of the AJT. The comparison between online (MT) and offline (SAJT) data is also important for the understanding of the bilingual mind since processing and post-processing data may show different tendencies. It is possible, for example, for a construction to be perceived as unacceptable despite being easily processed and also for a construction to be perceived as acceptable notwithstanding its high processing cost.

Next, we provide detailed information on the six experiments' participants, materials, procedures and results.

4.3 Experiment one

The first experiment consisted of an AJT. The independent variable was the type of pronoun that composed the target sentences: clitic pronouns or tonic pronouns. The dependent variable was the acceptability ratings given by the participants.

4.3.1 Participants

130 native speakers of BP were recruited for experiment one. The task had a between-subjects design and, hence, 65 participants responded to the AJT list 1, whose target sentences were instances of the depictive construction with a tonic pronoun in direct object position (98). The other 65 participants responded the AJT list 2, whose target sentences were also instances of the depictive construction but were formed by clitic pronouns in the direct object position (99).

98. *Linda fatiou o salmão e o comeu cru.*
Linda slice(PST) DET salmon and CLITIC-PRON eat(PST) raw
'Linda sliced the salmon and ate it raw.'

99. *Linda fatiou o salmão e comeu ele cru.*
Linda slice(PST) DET salmon and eat(PST) TONIC-PRON raw
'Linda sliced the salmon and ate it raw.'

Participants were residents of the Belo Horizonte metropolitan area in Brazil and were 26 years old in average (SD = 6 years). Participants had at least completed some university coursework and those who were students at the College of Letters of the Federal University of Minas Gerais (FALE-UFMG) received credits for their participation in this study. These participants constitute a so-called convenience sample since this study was conducted at the FALE-UFMG Psycholinguistics Laboratory. Souza et al. (2015) have tested if this kind of profile bias AJT results and their findings indicate that it does not. More specifically, the authors demonstrated that being a student of linguistics does not change significantly people's behavior in AJTs.

4.3.2 Materials

The experimental corpus was formed by 68 sentences. Participants were also introduced to four examples plus four sentences in the training session. The sentences were balanced in terms of grammaticality so that 50% of the sentences were grammatical and 50% were ungrammatical. This strategy aimed at mitigating as much as possible biases related to excessive repetition of items with similar grammaticality status. All the items were presented in a random order and in such a manner that the target sentences were less likely to be displayed in sequence. As a consequence, it was possible to reduce possible effects related to the order of presentation and repetition of the same structure.

There were eight target sentences in total and the other items were used as distractors. The target sentences were instances of the depictive construction. This construction was chosen because it has the same syntactic structure present in the resultative construction and, as opposed to the latter, it is licensed in BP. All the sentences were elaborated with the same syntax-semantics pattern, as shown below:

100. List 1:

- a. *Linda fatiou o salmão e comeu ele cru.*
Linda slice(PST) DET salmon and eat(PST) it(NOM.) raw
'Linda sliced the salmon and ate it raw.'
- b. *Érica perdeu o cão e encontrou ele morto.*
Érica lose(PST) DET dog and find(PST) it(NOM.) dead
'Erica lost the dog and found it dead.'
- c. *Júlia perdeu o telefone e encontrou ele quebrado.*
Júlia lose(PST) DET telephone and find(PST) it(NOM.) broken
'Júlia lost the telephone and found it broken.'
- d. *A gata pegou o rato e comeu ele vivo.*
DET cat catch(PST) DET mouse and eat(PST) it(NOM.) alive
'The cat caught the mouse and ate it alive.'
- e. *Renato comprou a pizza e comeu ela fria.*
Renato buy(PST) DET pizza and eat(PST) it(NOM.) cold
'Renato bought the pizza and ate it cold.'
- f. *Natália gostou do computador e comprou ele novo.*
Natália like(PST) PREP/DET computer and buy(PST) it(NOM.) new
'Natália liked the computer and bought it new.'
- g. *Eu ensopei a camisa e usei ela molhada.*
I soak(PST) DET shirt and wear(PST) it(NOM.) wet
'I soaked the shirt and wore it wet.'
- h. *Iara preparou o café e bebeu ele quente.*
Iara prepare(PST) DET coffee and drink(PST) it(NOM.) hot
'Iara prepared the coffee and drank it hot.'

101. List 2:

- i. *Linda fatiou o salmão e o comeu cru.*
Linda slice(PST) DET salmon and it(ACC.) eat(PST) raw
'Linda sliced the salmon and ate it raw.'
- j. *Érica perdeu o cão e o encontrou morto.*
Érica lose(PST) DET dog and it(ACC.) find(PST) dead
'Erica lost the dog and found it dead.'
- k. *Júlia perdeu o telefone e o encontrou quebrado.*
Júlia lose(PST) DET telephone and it(ACC.) find(PST) broken
'Júlia lost the telephone and found it broken.'
- l. *A gata pegou o rato e o comeu vivo.*
DET cat catch(PST) DET mouse and it(ACC.) eat(PST) alive
'The cat caught the mouse and ate it alive.'
- m. *Renato comprou a pizza e a comeu fria.*
Renato buy(PST) DET pizza and it(ACC.) eat(PST) cold
'Renato bought the pizza and ate it cold.'
- n. *Natália gostou do computador e o comprou novo.*
Natália like(PST) PREP/DET computer and it(ACC.) buy(PST) new
'Natália liked the computer and bought it new.'
- o. *Eu ensopei a camisa e a usei molhada.*
I soak(PST) DET shirt and it(ACC.) wear(PST) wet
'I soaked the shirt and wore it wet.'
- p. *Iara preparou o café e o bebeu quente.*
Iara prepare(PST) DET coffee and it(ACC.) drink(PST) hot
'Iara prepared the coffee and drank it hot.'

All items consisted of two sentences. The first one was formed by an NP in the subject position followed by a verb in the past tense and a direct object NP with a definite article. The second clause was the instance of the depictive construction. In list 1, it was formed by a coordinating conjunction, another verb in the past tense, a tonic pronoun as direct object referring to the direct object of the previous clause and an adjective that described the direct object. In List 2, it was formed by a coordinating conjunction, a clitic pronoun as direct object, another verb in the past tense and an adjective describing the

direct object. In both lists, the two NPs in each sentence differed from each other in terms of gender, which also decreased the possibility of ambiguous readings.

We chose this structure because, in the following experiments, it will be used with the depictive and the resultative construction. This syntactic-semantic pattern mitigates possible reading ambiguities.

4.3.3 Procedures

The experiment was produced at the Easy Test Maker website (<https://www.easytestmaker.com/>) and conducted through the Sona system (<https://fale-ufmg.sona-systems.com/>). The participants, who took part in this study voluntarily, signed the terms of informed consent (or *TCLE* in BP) (APPENDIX B) and registered at the Sona system.

During the instructions, participants were informed that the stimuli presentation was continuous and that acceptability ratings were given with the numeral keys 1, 2, 3, 4 and 5. In this Likert scale, 1 represented the lowest level of acceptability and 5 represented the highest level of acceptability. The other numbers represented intermediate values of acceptability. We also provided the participants with some commented examples in order to clarify what kind of analysis was expected from them in the task. We did so in order to help them understand that their acceptability judgment was supposed to be subjective and referring to the acceptability and not necessarily to the grammaticality of the sentences in prescriptive grammar. After these instructions, the participants began the task judging the items that constituted the training session. Next, the sentences that made up the experimental corpus were presented randomly and the participants performed the task at their own pace.

4.3.4 Results

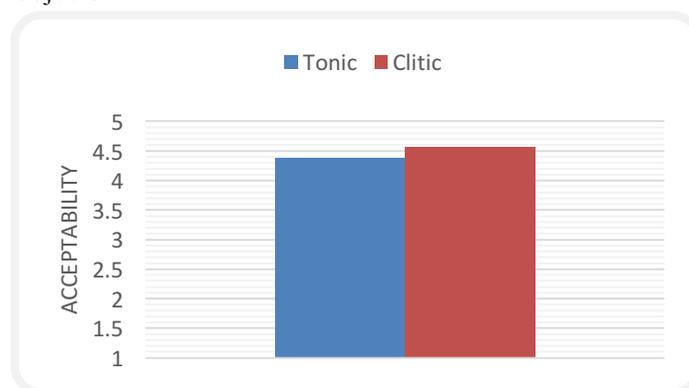
The data obtained from the AJT were generated by the Sona system and tabulated on Excel spreadsheets. In order to perform the statistical analyses for all the experiments, we used the SPSS statistical package version 21. The participants' acceptability ratings for critical items were compiled from the raw data of both list 1 and list 2. The results are shown in TAB. 4. The fixed value of α to reject the null hypothesis was .05

Table 4 – Mean and median acceptability ratings given to the depictive constructions with tonic and clitic pronouns.

Pronouns	Means	Medians
Tonic	4,38	5
Clitic	4,57	5

The acceptability ratings were tested for normality with the Shapiro-Wilk test. The participants' acceptability ratings in list 1 differed from the normal distribution ($W = .764$, $p < .001$) as did the participants' acceptability ratings in list 2 ($W = .864$, $p < .001$). Given the non-normality of the distributions observed, we conducted a pairwise post hoc analysis with nonparametric comparison of central tendencies, namely the Mann-Whitney test. The results indicated that the acceptability ratings in each list are significantly different ($U = 122532.5$, $W = 257992.5$, $Z = -3,116$, $p < .001$). Thus, the median and the means observed in the test suggest that both pronouns are considered highly acceptable as direct objects, but the Mann-Whitney test indicated that the clitic pronoun received significantly higher acceptability ratings. The results are illustrated in GRAPH. 1.

Graph 1 – Mean acceptability ratings given to the tonic (LIST A) and the clitic pronouns (LIST B) as direct objects.



The results suggest that the structure used in previous studies (OLIVEIRA, 2015; OLIVEIRA; MARCELINO, 2014; SOUZA et al., 2014), the resultative construction with clitic pronouns, is equally or more appropriate than the resultative construction with tonic pronouns. These results are also in accordance with other studies. Corrêa (1991), for instance, analyzed a corpus of spontaneous oral and written narratives and observed that the level of education influenced the use of 3P clitic and 3P tonic pronouns. The results obtained by the author indicated that, in the oral modality, the 3P tonic pronouns were prevalent among students who had not yet completed primary education. From first to fourth grade, the 3P clitic pronouns had a 0% occurrence and it reached no more than 14% in the following years of elementary school. However, among college students, the percentage rose to 60%. Therefore, we can see that in Corrêa, (op. cit.) there was a prevalence of 3P tonic pronouns among elementary school students and the two pronouns had a similar use among college students, but 3P clitic pronouns were prevalent.

In writing narratives, the numbers were considerably different. The 3P clitic pronouns were absent only among students from first and second grade. During high school years, the 3P clitic pronouns were used more often than the 3P tonic pronouns were and the latter were non-existent among college students. Thus, considering the

elementary school students, the 3P tonic pronouns were used in the oral modality, but not in the written modality. Among college students, 3P tonic pronouns were less frequent than the 3P clitic pronouns were in the oral modality and they did not occur in the written modality. As argued by Maia & Lima (2014), these results suggest that the acquisition of 3P clitic pronouns is very dependent on acquisition of prescriptive norms, whereas the 3P tonic pronouns seem to be acquired more naturally. Most importantly, Corrêa's studies suggest that in the written modality the 3P clitic pronouns is the most productive pronoun and, since our experiments consist of reading tasks, it seems to support our use of the 3P clitic pronouns.

There is also evidence that the 3P clitic pronouns are more easily processed than the tonic pronouns are in BP. Maia & Lima (2014) conducted two self-paced reading tasks. One had tonic pronouns in the target sentences whereas the other had clitic pronouns. The comparison between the two tasks revealed that the BP speakers took from 250ms up to 570ms longer to process the 3P tonic pronouns. Such variations were dependent on the type of antecedent. The authors interpret the results as evidence that the 3P clitic pronouns are processed more easily than the 3P tonic pronouns. Thus, the 3P clitic pronouns seem to be the most suitable pronominal form for the target sentences of the maze-task, which measures speakers' online processing.

To summarize, previous studies indicated that the 3P clitic pronouns were more productive and more easily processed than 3P tonic pronouns were, at least in the written modality for speakers who have completed at least some college coursework. Also, our results indicate that speakers with this same profile give higher acceptability ratings to 3P clitic pronouns in comparison with the 3P tonic pronouns. In conclusion, we have a considerable amount of evidence that suggests that the 3P clitic pronouns are the most appropriate form for our target sentences in the maze tasks and in the speeded

acceptability judgments tasks, since both will be performed by speakers who have completed at minimum some college coursework,

In the next section, we describe experiment two, whose goal was to observe bilinguals' online processing of the resultative construction.

4.4 Experiment two

Experiment two was conducted with a MT in BP. The independent variables were the constructions – resultative and depictive – and the linguistic profiles – BP monolinguals, non-immersed highly proficient BP-English bilinguals (henceforth non-immersed bilinguals) and immersed highly proficient BP-English bilinguals (henceforth immersed bilinguals). The dependent variable was the participants' reaction times for the AP in these constructions.

4.4.1 Participants

In total 69 people participated voluntarily in experiment two. They were grouped into BP monolinguals (27), non-immersed bilinguals (26) and immersed bilinguals (16)¹⁵. Participants were in average 27 years old ($SD = 4$) and their minimal level of education was some college or post-secondary coursework. BP monolinguals and non-immersed bilinguals were residents of the Belo Horizonte metropolitan area in Brazil. Immersed bilinguals were residents of the Boston/MA metropolitan area in the United States. Due to this difference in location, the data collection in the U.S. occurred some months after the one in Brazil.

¹⁵ There were four participants (one monolinguals and three non-immersed bilinguals) whose data was not correctly registered by the DMDX software and so they were not considered in our analysis.

All bilingual participants reached the highest level at the VLT test. Non-immersed bilinguals reported that BP was the language they used the most in their daily lives and immersed bilinguals reported that it was English that they used the most. It is worth mentioning that immersed bilinguals also reported that they still felt more comfortable using BP than using English. All the bilinguals were late learners of English, but whereas non-immersed bilinguals had learned their L2 mostly through formal instructions, immersed bilinguals had learned it mostly through exposure. The immersed bilinguals had been living in the U.S. for more than ten years, but they still used BP regularly to interact with Brazilian friends and relatives.

4.4.2 Materials

The materials used in experiment two formed a corpus containing 48 sentences. Participants also underwent a training session with ten sentences. Due to the nature of the experiment, only grammatical sentences were used, except for the target sentences, whose last word (an AP) can be considered ungrammatical in BP. The stimuli presentation was pseudo-randomized so that their order did not bias the results. The target and control sentences were arranged in a manner that they were unlikely to be displayed in sequence. Thus, it was possible to mitigate possible effects of repetition of the same syntactic-semantic structure.

One-third of the experimental corpus was formed by target sentences and control sentences. The eight target sentences instantiated the true resultative construction. The eight control sentences were instances of the depictive construction. Target and control sentences had the same structure used in experiment one list 2's target sentences in order to mitigate possible ambiguities. The sentences are presented below:

102. Target sentences/ resultative construction in BP:

- a. *O cozinheiro entortou a colher e a martelou plana.*
DET cook twist(PST) DET spoon and it(ACC) hammer(PST) flat
'The cook twisted the spoon and hammered it flat.'
- b. *A motorista molhou o carro e o esfregou limpo.*
DET driver water(PST) DET car and it(ACC) wipe(PST) clean
'The driver watered the car and wiped it clean.'
- c. *O estudante segurou a porta e a puxou fechada.*
DET student hold(PST) DET door and it(ACC) pull(PST) closed
'The student held the door and pulled it shut.'
- d. *A criança pintou o papel e o soprou seco.*
DET kid paint(PST) DET paper and it(ACC) blow(PST) dry
'The kid painted the paper and blew it dry.'
- e. *O marceneiro limpou a mesa e a lixou lisa.*
DET woodworker clean(PST) DET table and it(ACC) sand smooth
'The woodworker cleaned the table and sanded it smooth.'
- f. *A treinadora pegou o galão e o abasteceu cheio.*
DET trainer get(PST) DET gallon and it(ACC) filled full
'The trainer got the gallon and filled it full.'
- g. *A menina abriu o aquário e o drenou vazio.*
DET girl open(PST) DET aquarium and it(ACC) drain empty
'The girl opened the aquarium and drained it empty.'
- h. *A guitarrista plugou o cabo e o puxou reto.*
DET guitarist plug(PST) DET cable and it(ACC) pull(PST) straight
'The guitarist plugged the cable and pulled it straight.'

103. Control sentences/ depictive construction in BP:

- a. *O rapaz cortou a cenoura e a comeu crua.*
DET boy cut(PST) DET carrot and it(ACC) eat(PST) raw
'The boy cut the carrot and ate it raw.'
- b. *O bombeiro ouviu a gata e a encontrou ferida.*
DET fireman hear(PST) DET cat and it(ACC) find(PST) wounded
'The fireman heard the cat and found it wounded.'
- c. *A aluna perdeu o tablet e o encontrou quebrado.*
DET student lose(PST) DET tablet and it(ACC) find(PST) broken
'The student lost the tablet and found it broken.'

- d. *A águia pegou o peixe e o comeu vivo.*
 DET eagle catch(PST) DET fish and it(ACC) eat(PST) alive
 ‘The eagle caught the fish and ate it alive.’
- e. *A criança comprou a lasanha e a comeu fria.*
 DET kid buy(PST) DET lasagna and it(ACC) eat(PST) cold
 ‘The kid bought the lasagna and ate it cold.’
- f. *O cliente analisou a moto e a comprou nova.*
 DET client analyze(PST) DET motorcycle and it(ACC) buy(PST) new
 ‘The client analyzed the motorcycle and bought it new.’
- g. *O jogador lavou a meia e a usou molhada.*
 The player wash(PST) DET sock and it(ACC) use(PST) wet
 ‘The player washed the sock and used it wet.’
- h. *O professor preparou o chá e o bebeu quente.*
 DET teacher prepare(PST) DET tea and it(ACC) drink(PST) hot
 ‘The teacher prepared the tea and drank it hot.’

4.4.3 Procedures

DMDX software (FORSTER & FORSTER, 2003) was utilized to present the stimuli, to manage the randomization and to record the reaction times (RTs) for each segment. A laptop with the Windows operating system was used to run the software. Before starting the training session, participants filled out the terms of informed consent (or *TCLE* in BP). Then they were introduced to the instructions, which were displayed on the laptop. Participants were informed that they should form sentences by selecting, from each pair of words, the ones that best suited the sentences being formed. The participants used two keys, left-shift and right-shift, which were highlighted with colored stickers. After the instructions, the participants read some examples and then began the training session. The sentences were presented continuously and in a random order. Participants were able to take a break right after they had gone halfway through the task. Each pair of words was visible for the participants for up to 4 seconds and, if the choice was not made by then, the next sentence was automatically displayed.

The experiment was fully conducted in BP to provide the participants with a context that did not encourage them to use their second language. In other words, we tried to bring participants as close as possible to a monolingual mode (GROSJEAN, 2013). As discussed in section 3.2, Grosjean (op. cit.) argues that bilinguals disable one of their languages as much as possible in interactions with people that do not speak that language. Therefore, in this task, we aimed at observing possible L2 influence on the L1 in a context that did not encourage the use of the L2.

4.4.4 Results

The MT data was recorded by the DMDX software and tabulated on Excel spreadsheets. We compiled the participants' means for critical items and performed the statistical analyses. The main hypothesis was that bilinguals would exhibit lower RTs for the adjective phrase (AP) in the resultative construction compared to monolinguals. This hypothesis was based on the idea that during L1 processing bilinguals might have access to L2 parsing strategies. In order to test that, we compared the participants' RTs for target and control sentences' APs. Mean RTs' are shown in TAB. 5. The fixed value of α to reject the null hypothesis was .05

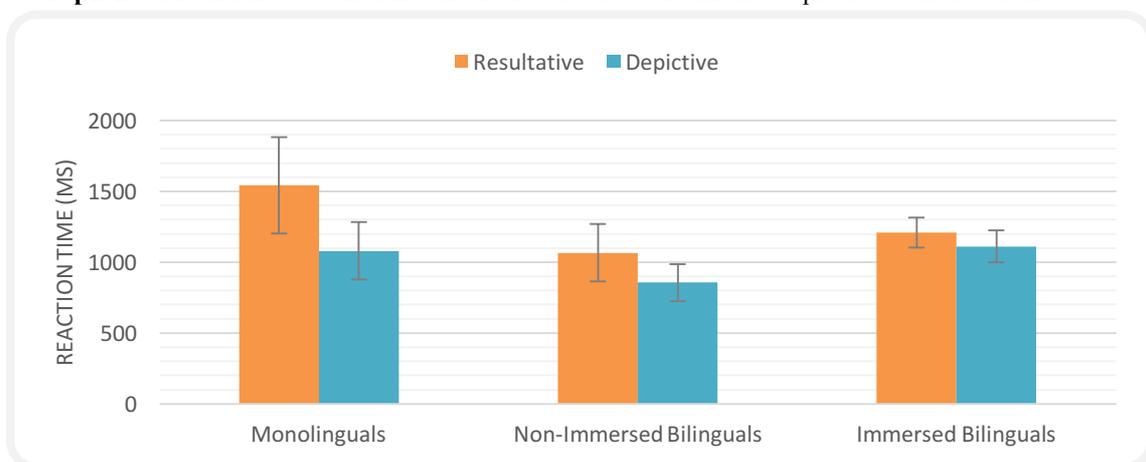
Table 5 – Mean RTs and standard deviation for the APs in the resultative constructions and in the depictive constructions.

Type	Monolinguals	Non-immersed bilinguals	Immersed bilinguals
Resultative	1544.4 (204.5)	1066.7 (340.6)	1209.7 (107.1)
Depictive	1079.8 (131.4)	855.9 (204)	1112.35 (111.1)

The Shapiro-Wilk test was run to test the RTs for normality. The monolinguals' means for the resultative construction ($W = .988, p = .988$) and for the depictive construction ($W = .954, p = .302$) did not differ from the normal distribution. The non-immersed bilinguals' means for the resultative construction ($W = .964, p = .516$) and the depictive construction ($W = .987, p = .987$) did not differ from the normal distribution either. Similar results were observed with immersed bilinguals means for the resultative ($W = .980, p = .964$) and the depictive construction ($W = .908, p = .110$).

In order to compare the groups' RTs to process the APs in the resultative and in depictive construction, we conducted Student's T-tests. The Pairwise T-test indicated that there was a significant difference between the monolinguals' scores for the resultative and the depictive constructions ($t_1 = -7.552$ ($df = 24$), $p < .001$; $t_2 = -8,321$ ($df = 7$), $p < .001$). There was also a significant difference between the non-immersed bilinguals' scores for the resultative and the depictive constructions ($t_1 = -8.478$ ($df = 23$), $p < .001$; $t_2 = -3.230$ ($df = 7$), $p < .01$). Immersed bilinguals' scores for the resultative and the depictive construction also yielded a significant difference ($t_1 = 3,392$ ($df = 15$), $p < .01$; $t_2 = 2,693$ ($df = 7$), $p < .04$). The three groups' behaviors towards the target and the control sentences are illustrated in GRAPH 2.

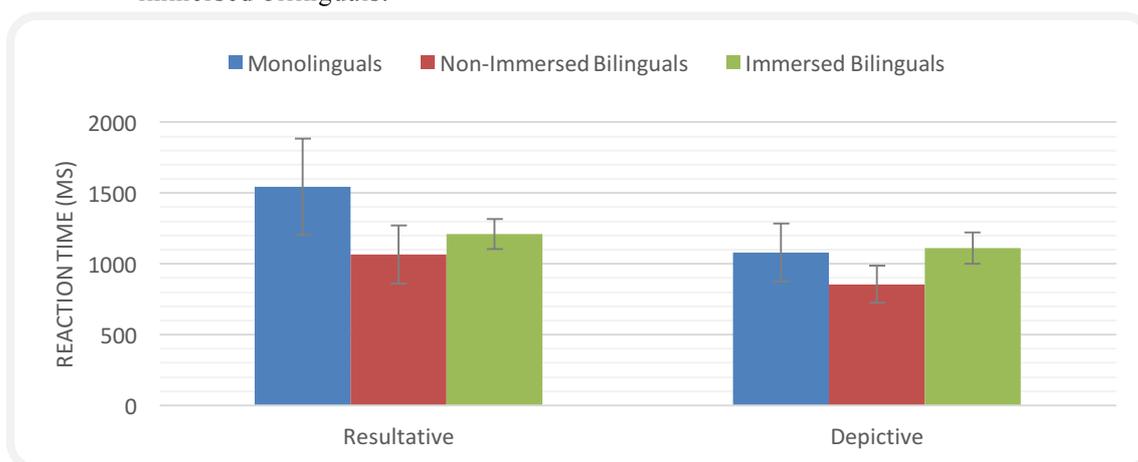
Graph 2 – Mean RTs for the APs in the resultative and in the depictive constructions.



All the groups showed a statistically reliable difference between the resultative and the depictive construction. However, the mean difference between the two constructions is considerably larger in the monolingual group. As compared to the RTs for the depictive construction, monolinguals took in average 465ms longer to process the resultative construction, whereas non-immersed bilinguals took 210ms longer and immersed bilinguals took only 97ms longer. In other words, high proficiency in English seems to reduce the difference between these two constructions and immersion reduces it further.

The one-way analyses of variance (ANOVA) revealed that there was a group effect towards both the resultative construction ($F(1, 62) = 22.196, p < .001$; $F(2, 21) = 21.915, p < .001$) and the depictive construction ($F(1, 62) = 16.587, p < .001$; $F(2, 21) = 13.161, p < .001$). Post hoc tests adjusted with the Bonferroni correction indicated that, towards the resultative construction, monolinguals differed from both non-immersed bilinguals ($p > .001$) and immersed bilinguals ($p > .001$), whereas the latter two did not differ from each other ($p = .27$). In regards to the depictive construction, non-immersed bilinguals' acceptability ratings yielded a statistically reliable difference compared to both the monolinguals ($p < .001$) and the immersed bilinguals ($p < .001$), whereas the latter two did not differ from each other ($p = 1.0$). The RTs for the constructions under scrutiny by monolinguals, non-immersed bilinguals and immersed bilinguals are illustrated in GRAPH 3.

Graph 3 – Mean RTs and standard deviation by monolinguals, non-immersed bilinguals and immersed bilinguals.



Both immersed and non-immersed bilinguals processed the AP in the resultative construction significantly faster than monolinguals did. We understand that this difference suggests that the resultative construction imposes a high processing cost to monolinguals, as we expected due to the ungrammaticality and unproductivity of this construction in BP. Notwithstanding such characteristics, bilingualism seems to provide bilinguals with the ability to process the resultative construction in BP without exhibiting this additional processing cost observed among monolinguals.

As for the depictive construction, we expected all the groups to behave alike. However, our results indicate that one of the bilingual groups, namely the non-immersed bilinguals, processed the AP in the depictive construction significantly faster as well. Our hypothesis is that the fact that these speakers learned their second language mostly through formal instruction endowed them with better metalinguistic skills. We will seek further evidence of such hypothesis in the next experiments in BP as well.

In sum, the MT data indicates that bilingualism can indeed facilitate processing, in the L1, of L2-specific argument structure constructions. Moreover, this facilitation seems to be enhanced by immersion. A follow up question that emerges from these findings is related to the nature of this bilingualism effect: is this apparent departure from

L1 restrictions during online processing supported by a momentary co-activation of L1 and L2 representations, or a change in the overall L1 grammar (SOUZA et al., 2016)? In order to answer this question, we conducted a SAJT in experiment three, which will be described in the next section.

4.5 Experiment three

Experiment three was a SAJT carried out in BP. The independent variables were the constructions – resultative or depictive – and the participants’ linguistic profile – BP monolinguals, non-immersed bilinguals and immersed bilinguals. The dependent variables were the acceptability ratings and the rate of time ceiling violations.

4.5.1 Participants

The same participants who took part in experiment two performed experiment three, but none of them had taken part in experiment one. In total, there were 69 participants. As in experiment two, participants were grouped into BP monolinguals (26), non-immersed bilinguals (27) and immersed bilinguals (16).

4.5.2 Materials

The experimental stimuli for experiment three consisted of 96 sentences. The participants also judged other 15 sentences during the training session. As in experiment one, the sentences were balanced according to their grammaticality status, i.e., 50% of the sentences were grammatical and 50% were ungrammatical. The items were pseudo-randomized so that target and control sentences tended not to be displayed in sequence.

Thus, it was possible to mitigate possible effects related to (i) repetition of (un)grammatical sentences, (ii) repetition of the same construction and (iii) order of presentation.

Within the 96 experimental sentences, there were eight target sentences and eight control sentences. The target sentences forced the resultative construction into BP and the control sentences instantiated the depictive construction. These sentences are presented below:

104. Target sentences/ resultative construction in BP:

- a. *A artesã limpou o metal e o martelou plano.*
DET craftswoman clean(PST) DET metal and it(ACC) hammer(PST) flat
'The craftswoman cleaned the metal and hammered it flat.'
- b. *O garçom arrumou a mesa e a esfregou limpa.*
DET waiter set(PST) DET table and it(ACC) wipe(PST) clean
'The waiter set the table and wiped it clean.'
- c. *O garoto conferiu a janela e a puxou fechada.*
DET boy check(PST) DET window and it(ACC) pull(PST) closed
'The boy checked the window and pulled it shut.'
- d. *O menino pintou a unha e a soprou seca.*
DET boy paint(PST) DET nail and it(ACC) blow(PST) dry
'The boy painted the nail and blew it dry.'
- e. *A frentista abriu o tanque e o abasteceu cheio.*
DET gas-station-attendant open(PST) DET tank and it(ACC) filled full
'The gas station attendant opened the tank and filled it full.'
- f. *O artista cortou a madeira e a lixou lisa.*
DET artist cut(PST) DET wood and it(ACC) sand(PST) smooth
'The artist cut the wood and sanded it smooth.'
- g. *O caseiro limpou a piscina e a drenou vazia.*
DET caretaker clean(PST) DET swimming-pool and it(ACC) drain(PST) empty
'The caretaker cleaned the swimming pool and drained it empty.'
- h. *O bombeiro amarrou a corda e a puxou reta.*
DET fireman tie(PST) DET rope and it(ACC) pulled straight
'The fireman tied the rope and pulled it straight.'

105. Control sentences/ depictive construction in BP:

- a. *O japonês fatiou o salmão e o comeu cru.*
DET japanese slice(PST) DET salmon and it(ACC) eat(PST) raw
'The japanese sliced the salmon and ate it raw.'
- b. *A vizinha perdeu o cão e o encontrou morto.*
DET neighbor lose(PST) DET dog and it(ACC) find(PST) dead
'The neighbor lost the dog and found it dead.'
- c. *A velhinha perdeu o celular e o encontrou quebrado.*
DET old-lady lose(PST) DET cell phone and it(ACC) find(PST) broken
'The old lady lost the cell phone and found it broken.'
- d. *A gata pegou o rato e o comeu vivo.*
DET cat catch(PST) DET mouse and it(ACC) eat(PST) alive
'The cat caught the mouse and ate it alive.'
- e. *O jovem comprou a pizza e a comeu fria.*
DET boy buy(PST) DET pizza and it(ACC) eat(PST) cold
'The boy bought the pizza and ate it cold.'
- f. *Rui descarregou a caixa e a trouxe vazia.*
Rui unload(PST) the box and it(ACC) bring(PST) empty
'Rui unloaded the box and brought it empty.'
- g. *O atleta ensopou a camisa e a usei molhada.*
DET athlete soak(PST) DET shirt and it(ACC) use(PST) wet
'The athlete soaked the shirt and used it wet.'
- h. *A moça preparou o café e o bebeu quente.*
DET girl prepare(PST) DET coffee and it(ACC) drink(PST) hot
'The girl prepared the coffee and drank it hot.'

The sentences had about 35 characters each, which is a sentence size compatible with the time ceiling of 4 second per sentence that was given to the participants (SOUZA et al., 2015). The target and control sentences' structures were similar to the ones in the previous experiments. All the sentences were formed by a clause with an NP in the subject position, a verb in the past tense and an NP with a definite article as the direct object. Then there was a second clause that was formed by a coordinating conjunction, a clitic pronoun referring to the previous clause's direct object, another verb in the past tense and

an AP. Control and target sentences only differed from each other in regards to the interpretation assigned to their APs.

In order to better understand the participants' behavior, we included a comparison group of test sentences with obviously grammatical sentences (grammatical) and another group with sentences whose words were completely out of order (ungrammatical). The two groups are presented below:

106. Grammatical in BP:

- a. *O menino fez as comidas da festa.*
DET boy made DET food of party
'The boy made the party food.'
- b. *A mulher usou seu cartão de crédito.*
DET woman use(PST) POSS card of credit
'The woman used her credit card.'
- c. *O homem colocou os livros na mala.*
DET man put(PST) DET books in(DET) bag
'The man put the books in the bag.'
- d. *O gerente promoveu seu subordinado.*
DET manager promote(PST) POSS subordinate
'The manager promoted his subordinate.'
- e. *A empresa produz sementes de trigo.*
DET company produce seeds of wheat
'The company produces wheat seeds'
- f. *A menina chamou o pai para almoçar.*
DET girl invite(PST) DET father to have lunch
'The girl invited the father for lunch.'
- g. *O homem inseriu os dados no sistema.*
DET man insert(PST) DET data in(DET) system
'The man inserted the data in the system.'
- h. *Os diretores elegeram o presidente.*
DET directors elect(PST) DET president
'The directors elected the president.'

107. Ungrammatical in BP:
- a. *Hudson bem falaram Alemão muito.*
Hudson well speak(PST) German very
 - b. *Lúcia vídeo fins de jogaram semana jogo.*
Lúcia vídeo ends of play(PST) week game
 - c. *Antônio noite computador usaram em.*
Antônio night computer use(PST) in
 - d. *Ronaldo o gostar a tocaram guitarra.*
Ronaldo DET like(PST) DET play(PST) guitar
 - e. *Adélia manhã café o em beberam.*
Adélia morning coffee DET in drank
 - f. *Tony história matemática odeia e.*
Tony history mathematics hate and
 - g. *Michel todo Italiano estudar falaram.*
Michel all Italian study(INF) speak(PST)
 - h. *Linda dele amaram irmã dele e irmão.*
Linda his love(PST) sister his and brother.

4.5.3 Procedures

The DMDX software was again responsible for the stimuli presentation, the randomization management and the data collection. The instructions were displayed on the computer screen. Participants were informed that in the task at hand they were required to judge sentences in relation their word selection and word order. Participants were instructed to consider only these two factors, trying to ignore pragmatic aspects. Also, they read examples that emphasized that they were evaluating how acceptable the sentences sounded and not necessarily their grammaticality status according to prescriptive norms. After that, the participants began the training session judging 15 sentences. Participants took one break halfway through the task.

4.5.4 Results

DMDX was used for stimulus display and data collection. The main hypothesis that motivated experiment three was the possibility that bilinguals were more accepting than monolinguals of the resultative construction in BP due to possible access to the L2 grammar while processing their L1. To verify this hypothesis, we compared bilinguals' and monolinguals' acceptability ratings given to the resultative construction in the SAJT. The fixed value of α to reject the null hypothesis was .05. Post-hoc analyses with the Mann-Whitney test adjusted with the Bonferroni correction had different significance levels: .016 for comparisons between three groups and .012 for comparisons between four groups.

We excluded from analysis RTs that were shorter than 1ms on trials that were preceded by unjudged sentences in order to discard responses from participants who exceeded the time ceiling of a sentence and ended up assigning its acceptability rating to the next sentence. In total 64 out of 2,208 acceptability ratings, or 3,1% of the whole dataset, were discarded. The results from the data included in our analysis are presented below; acceptability ratings are illustrated in TAB. 6 and the rate of time ceiling violations are in TAB. 7.

Table 6 – Mean and median acceptability ratings given to the resultative, depictive, grammatical and ungrammatical groups in BP.

Type	Monolinguals	Non-immersed bilinguals	Immersed bilinguals
Resultative	3,73 (4)	3.82 (4)	3.96 (4,5)
Depictive	4.52 (5)	4.65 (5)	4.47 (5)
Grammatical	4.49 (5)	4.81 (5)	4.51 (5)
Ungrammatical	1.69 (1)	1.16 (1)	1.32 (1)

Table 7 – Rate of time ceiling violations for the resultative, depictive, grammatical and ungrammatical groups in BP.

Type	Monolinguals	Non-immersed bilinguals	Immersed bilinguals
Resultative	17%	8%	7%
Depictive	10%	2%	6%
Grammatical	3%	3%	2%
Ungrammatical	4%	1%	4%

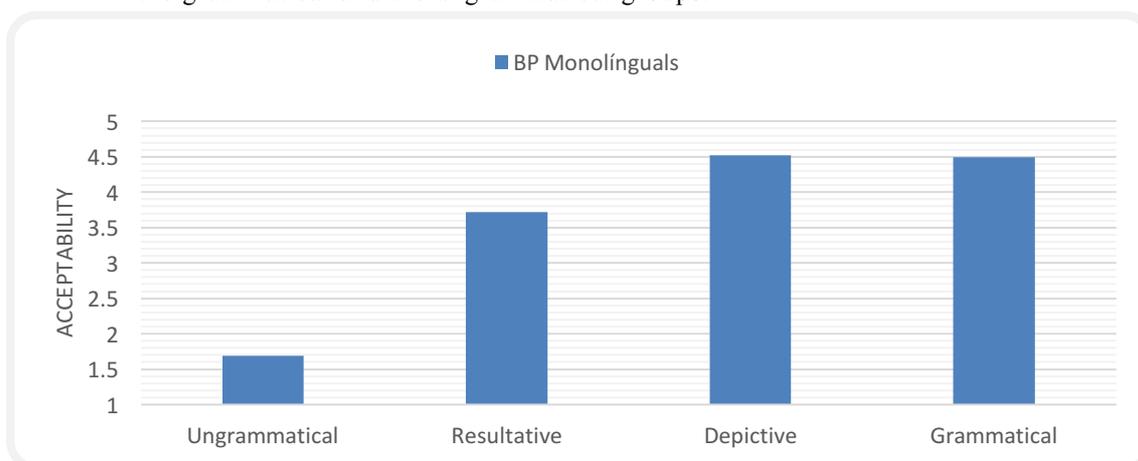
The acceptability ratings were tested for normality with the Shapiro-Wilk test. The monolinguals' acceptability ratings for all the constructions differed from the normal distribution: resultative ($W = .922, p < .05$), depictive ($W = .752, p < .01$), grammatical ($W = .871, p < .01$) and ungrammatical ($W = .910, p < .03$). The same behavior was noticed among the non-immersed bilinguals: resultative ($W = .925, p < .05$), depictive ($W = .766, p < .01$), grammatical ($W = .709, p < .01$), ungrammatical ($W = .680, p < .01$). The immersed bilinguals' acceptability ratings also differed from the normal distribution: resultative ($W = .775, p < .001$), depictive ($W = 505, p < .001$), grammatical ($W = 549, p < .001$) and ungrammatical ($W = .624, p < .001$).

Due to the non-normality of the data, we ran the Kruskal-Wallis test to analyze the differences between constructions by each group of speakers. The Kruskal-Wallis test showed that there was a significant difference between the monolinguals' acceptability ratings for each sentence type ($\chi^2 = 201.443, p < .001$) with a mean rank of 528.59 for the grammatical, 502.43 for the depictive, 387.02 for the resultative and 243.67 for the ungrammatical sentences.

We utilized the Mann-Whitney test adjusted with the Bonferroni correction for pairwise post hoc analyses. The results indicate that monolinguals' acceptability ratings for the resultative sentences were significantly different from their acceptability ratings for the depictive ($U = 15225, W = 36961, Z = -5.603, p < .001$) and the grammatical sentences ($U = 13941.5, W = 35677.5, Z = -6719, p < .001$). The difference between the depictive and the grammatical sentences was not significant ($U = 20410.5, W = 42146.5,$

$Z = -1.094$, $p = .274$). The ungrammatical sentences differed significantly from all the other sentence types. In short, the resultative construction was perceived as less acceptable than both the depictive and the grammatical sentences, which did not differ from each other. GRAPH 4 illustrates these results.

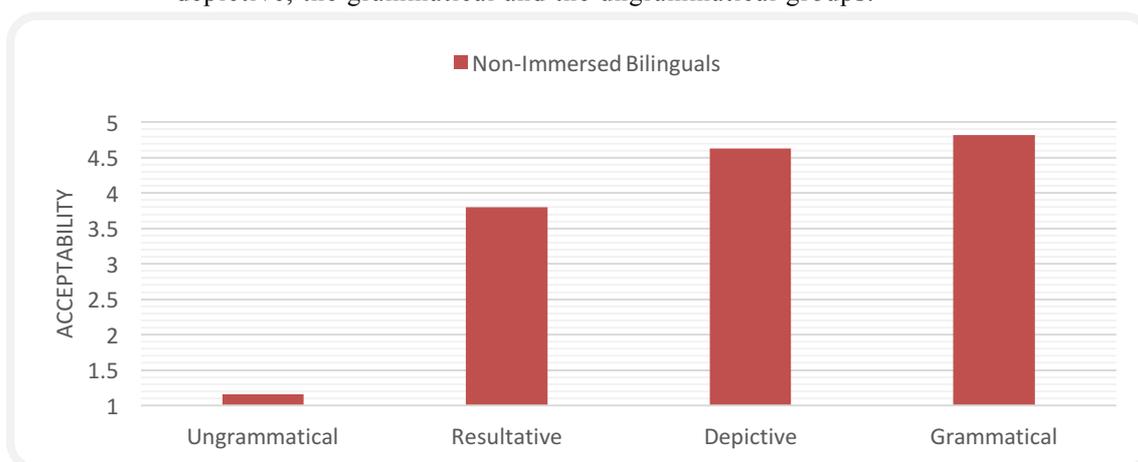
Graph 4 – Monolinguals’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.



The Kruskal-Wallis test also showed that there was a statistically reliable difference between acceptability ratings for the three sentence types amongst the non-immersed bilinguals’ acceptability ratings ($\chi^2 = 84.720$, $p < .001$). The mean rank was 585.07 for the grammatical, 562.81 for the depictive, 413.47 for the resultative and 167.36 for the ungrammatical sentences.

The Mann-Whitney test adjusted with Bonferroni correction indicated that non-immersed bilinguals’ acceptability ratings for the resultative sentences is significantly different from the acceptability ratings for the depictive ($U = 13612.5$, $W = 37028.5$, $Z = -8.225$, $p < .001$) and the grammatical sentences ($U = 12143.5$, $W = 35579.5$, $Z = -9.625$, $p < .001$). The depictive sentences did not differ from the grammatical ones ($U = 21453$, $W = 44889$, $Z = -1.925$, $p < .08$). The ungrammatical sentences showed a significant difference compared to all the other sentences types. GRAPH 4 illustrates the results.

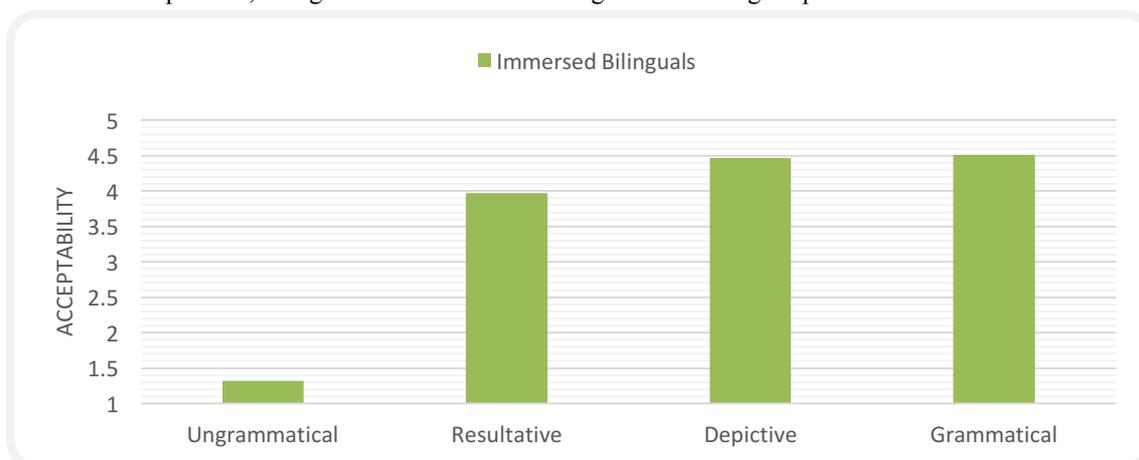
Graph 5 – Non-immersed bilinguals’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.



The Kruskal-Wallis test also indicated that there was a significant difference between the immersed bilinguals’ acceptability ratings for each sentence type ($\chi^2 = 199.215$, $p < .001$) with a mean rank of 324.82 for the depictive, 321.53 for the grammatical, 269.57 for the resultative and 110.08 for the ungrammatical sentences.

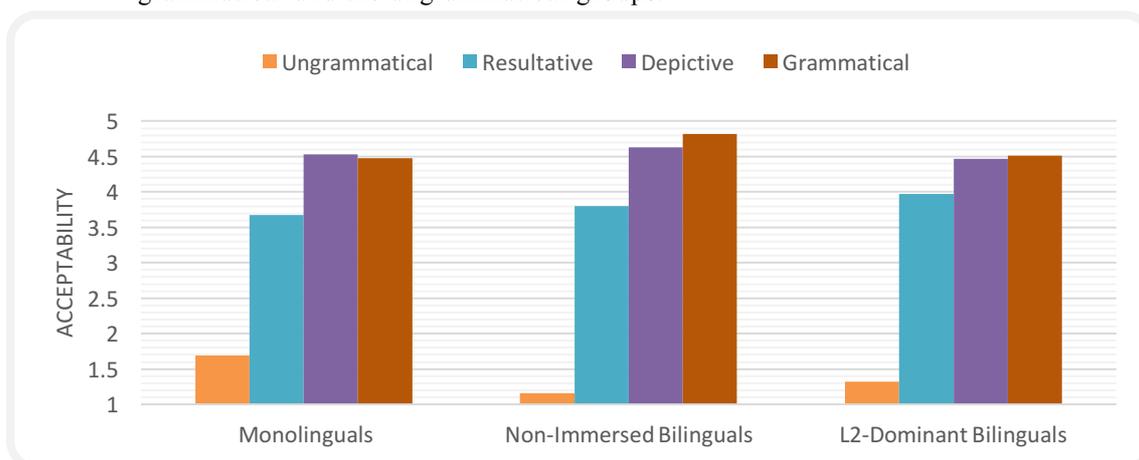
We utilized the Mann-Whitney test adjusted with the Bonferroni correction for pairwise post hoc analyses. The results indicate that non-immersed bilinguals’ acceptability ratings for the resultative group are significantly different from their acceptability ratings for the depictive ($U = 6114$, $W = 14370$, $Z = -3.910$, $p < .001$) and the grammatical groups ($U = 6315$, $W = 14571$, $Z = -3.493$, $p < .001$). The difference between the depictive and the grammatical groups was not significant ($U = 7935.5$, $W = 16191.5$, $Z = -.526$, $p = .599$). The ungrammatical group differed significantly from all the other groups. In sum, immersed bilinguals also perceived the resultative group as less acceptable than the depictive and the grammatical groups, which were perceived as being similar. GRAPH. 6 illustrates these results.

Graph 6 – Immersed bilinguals’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.



In short, monolinguals, immersed bilinguals and non-immersed bilinguals behaved alike. All the groups judged the resultative construction as less acceptable than the depictive and the grammatical groups. Also, they indicated that the two latter groups had similar acceptability and that the ungrammatical group was significantly less acceptable than all the other groups were. The results are summarized in GRAPH 7.

Graph 7 – Participants’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.



We also compared monolinguals’, non-immersed bilinguals’ and immersed bilinguals’ acceptability ratings for each group of sentences. The Kruskal-Wallis test

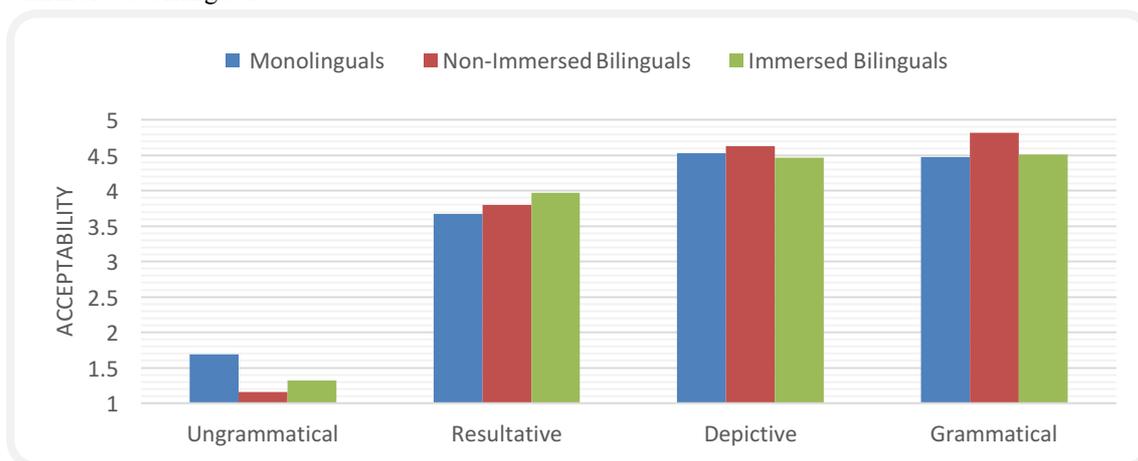
indicated that the acceptability ratings for the resultative construction did not yield a significant difference ($\chi^2 = 2.355$, $p = .31$) with a mean rank of 252.52 for immersed bilinguals, 231.69 for non-immersed bilinguals and 230.80 for monolinguals. The Kruskal-Wallis also showed that the acceptability ratings for the depictive sentence did not yield a statistically reliable difference ($\chi^2 = 1.016$, $p = .602$) with a mean rank of 255.16 for non-immersed bilinguals, 249.70 for immersed bilinguals and 244.23 for monolinguals.

As for the grammatical sentences, the test indicated that there was a significant difference ($\chi^2 = 18482$, $p < .001$) with a mean rank of 278.81 for non-immersed bilinguals, 245.85 for monolinguals and 231.50 for immersed bilinguals. Post hoc analyses with the Mann-Whitney test indicated that non-immersed bilinguals differed significantly from both monolinguals ($U = 16470$, $W = 34,048$, $Z = -3.319$, $p < .01$) and immersed bilinguals ($U = 9929$, $W = 17310$, $Z = -4.193$, $p < .001$). Monolinguals and immersed bilinguals did not exhibit a significant difference ($U = 10701.5$, $W = 18082$, $Z = -1.042$, $p < .297$). Non-immersed bilinguals exhibited higher acceptability to the group of simple grammatical sentences, as compared to the other speakers. This difference can be interpreted as further evidence that non-immersed bilinguals exhibit better metalinguistic skills.

The acceptability ratings for the ungrammatical sentences yielded a significant difference ($\chi^2 = 32.026$, $p < .001$) with a mean rank of 289.01 for monolinguals, 271.54 for immersed bilinguals and 227.60 for non-immersed bilinguals. The Mann-Whitney test showed that the non-immersed bilinguals differed significantly from both monolinguals ($U = 15244$, $W = 36772$, $Z = -5.575$, $p < .001$) and the immersed bilinguals ($U = 10342$, $W = 31870$, $Z = -3.393$, $p < .001$). The two latter groups did not differ significantly from each other ($U = 10770$, $W = 19082.5$, $Z = -1.042$, $p < .186$). Once again it seems that

possible enhanced metalinguistic skills due to the linguistic training during formal instruction on the L2 made non-immersed bilinguals significantly more accurate than all the other groups. The results are illustrated in GRAPH 8.

Graph 8 – Mean acceptability ratings given by monolinguals, non-immersed bilinguals and immersed bilinguals.

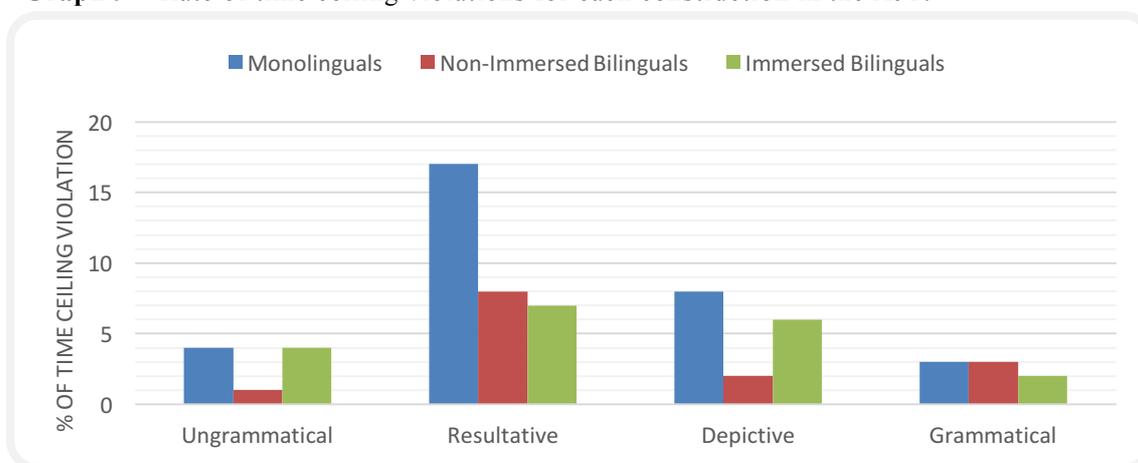


In sum, the three groups of speakers not only perceived the resultative construction as less acceptable than the depictive construction, they also exhibited acceptability ratings for both constructions that were not significantly different. Our results indicate that there are not any differences between the manner by way of which monolinguals, non-immersed bilinguals and immersed bilinguals perceive the acceptability of these two constructions. Therefore, bilingualism does seem to exert influence over bilinguals' metalinguistic awareness in the L1.

As in Souza et al. (2015), we also measured the rate of time ceiling violations. The frequency by which each type of sentence is left unjudged due to time limit violations can be a reflection of their processing cost. The MT in experiment two revealed that monolinguals take much longer to process the resultative construction than bilinguals do. The analysis of time limit violations in this experiment corroborates those results. Whereas monolinguals went over the time limit in 17% of the resultative sentences, non-

immersed bilinguals did it in only 8% and immersed bilinguals did it only 7%. In GRAPH 9, we can notice that the monolinguals rate of time ceiling violations when judging the resultative sentences was distinct from the general rate. As a result, the frequency participants went over the time ceiling also suggest that bilinguals can process the sentences that force the resultative construction into BP more smoothly than monolinguals can.

Graph 9 – Rate of time ceiling violations for each construction in the AJT.



In the next section, we describe experiment four, which is a replication of the SAJT in experiment three.

4.6 Experiment four

Experiment four is a replication of experiment three with participants who had not been involved in any of this study's experiments beforehand. Hence, experiment four was also carried out in BP with the SAJT. The independent variables were again the constructions – resultative or depictive – and the participants' linguistic profile – BP monolinguals, non-immersed bilinguals and immersed bilinguals. The dependent

variables were the participants' acceptability ratings and the rate of time ceiling violations.

4.6.1 Participants

In total 32 participants performed the task in experiment four. By the time we conducted this experiment to validate the findings from experiment three, we had not collected any data from immersed bilinguals. Consequently, we only compared the data from non-immersed bilinguals and BP monolinguals. 20 participants constituted the non-immersed bilingual group and 12 participants formed the BP monolingual group. Participants were in average 23 years old ($SD = 4$) and their minimal level of education was some college or post-secondary coursework.

4.6.2 Materials

As in experiment three, the experimental stimuli consisted of 96 sentences, which were designed and organized in a manner that mitigated possible effects related to (i) repetition of (un)grammatical sentences, (ii) repetition of the same construction and (iii) order of presentation. The resultative, the depictive and the grammatical sentences were the same utilized in experiment three. Only the ungrammatical sentences were different. After analyzing the results of experiment three, we suspected that the ungrammatical sentences might have influenced the acceptability ratings for all the other sentence types. The ungrammatical sentences were very abnormal and that may have increased the acceptability of the other sentence types. Thus, we replaced these sentences that contained violations in word order with sentences that contained obvious agreement violations. This new sentence type is presented below:

108. Ungrammatical sentences in BP

- a. *O cachorro vieram para casa molhados.*
DET dog come(PST-PLU) to house wet(PLU)
'The dog came home wet.'
- b. *O politico votaram a favor da nova medida.*
DET politician vote(PST-PLU) in favor of-DET new measure
'The politician voted in favor of the new measure.'
- c. *O computador facilitaram os processos da empresa.*
DET computer facilitate(PST-PLU) DET processes of-DET company
'The computer facilitated the company's process.'
- d. *A secretária participaram da reunião de ontem.*
DET secretary participate(PST-PLU) of-DET meeting of yesterday
'The secretary attended the meeting yesterday.'
- e. *A faxineira limpavam todas as salas da escola.*
DET cleaning-lady clean(PST-PLU) all DET rooms of-DET school
The cleaning lady cleaned all the rooms in the schools.
- f. *A vendedora ofereceram seus produtos ao cliente.*
DET saleswoman offer(PST-PLU) their products to-the client
'The saleswoman offered their products to the client.'
- g. *O cientista descobriram uma nova cura para a doença.*
DET cientista discover(PST-PLU) a new cure for DET disease
'The scientist discovered a new cure for the disease.'
- h. *A médica caminharam pelo novo hospital.*
DET doctor walk(PST-PLU) around-the new hospital
'The doctor walked around the new hospital.'

4.6.3 Procedures

The testing procedure in experiment four was basically the same adopted in experiment three, described in section 4.5.3. The only differences were the software utilized and the time ceiling imposed to the participants. Instead of using the DMDX, we used PsychoPy out of convenience given that it was already being used at the testing site. As it was observed, there were many time ceiling violations with the four-second limit

imposed in experiment three. Thus, we decided to use a six-second limit in order to gather as much information as possible from the acceptability ratings. The six-second limit is also suggested by Souza et al. (2015).

4.6.4 Results

The PsychoPy recorded the acceptability ratings and RTs. At this time, there were not any sentences whose RTs were shorter than 1ms on trials that were preceded by unjudged sentences. Therefore, no data were discarded from the 1024 acceptability ratings. Again, the main hypothesis was the possibility that bilinguals were more accepting of the resultative construction in BP than monolinguals due to possible access to the L2 grammar while processing their L1. To verify this hypothesis, we compared bilinguals' and monolinguals' acceptability ratings for the resultative construction in the SAJT. The fixed value of α to reject the null hypothesis was .05. Post-hoc analyses with the Mann-Whitney test adjusted with the Bonferroni correction had a different significance level: .012. The results are presented in TAB. 8 and TAB. 9.

Table 8 – Mean and median acceptability ratings given to the resultative, depictive, grammatical and ungrammatical groups in BP.

Type	Monolinguals	Non-immersed bilinguals
Resultative	3.27 (3)	3.19 (3)
Depictive	4.57 (5)	4.75 (5)
Grammatical	4.91 (5)	4.88 (5)
Ungrammatical	2.34 (2)	2.33 (3)

Table 9 – Rate of time ceiling violations for each construction in the SAJT.

Profile	Ungrammatical	Resultative	Depictive	Grammatical
Monolinguals	2%	8%	2%	1%
Non-immersed bilinguals	2%	3%	1%	2%

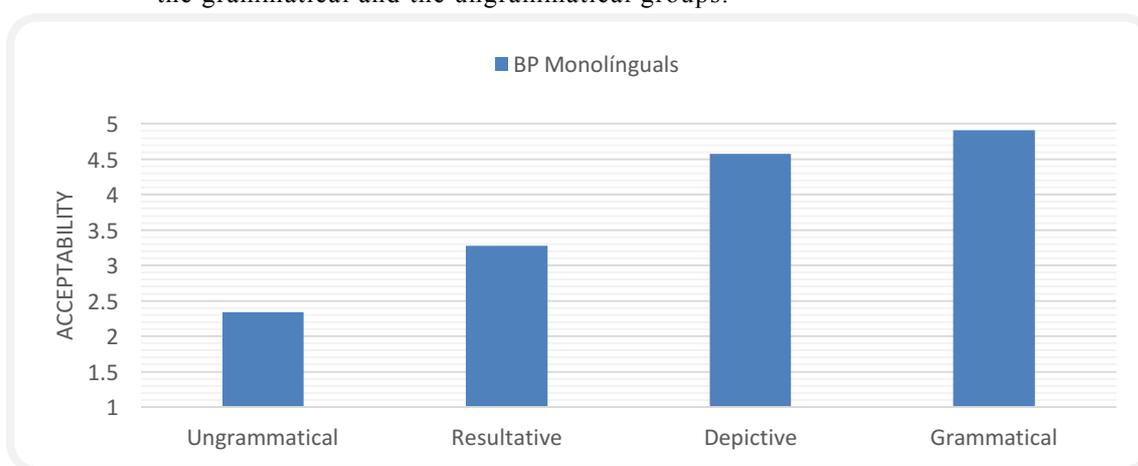
The acceptability ratings were tested for normality with the Shapiro-Wilk test. Monolinguals' acceptability ratings for the resultative ($W = .974, p = .947$), the depictive ($W = .898, p = .150$) and the grammatical sentences ($W = .891, p = .123$) did not differ from the normal distribution, but their acceptability ratings for the ungrammatical sentences did ($W = .748, p < .01$). Bilinguals' acceptability ratings for the grammatical ($W = .982, p = .989$) and the ungrammatical sentences ($W = .972, p = .928$) did not differ from the normal distribution, but their acceptability ratings for the resultative ($W = .560, p < .001$) and the depictive sentences did ($W = .633, p < .001$). Due to the non-normality observed in some distributions, we followed up on our initial analysis with non-parametric tests.

The Kruskal-Wallis test was used for the analysis of the differences between each sentence type by each participant group. The test indicated that there was a significant difference between the monolingual acceptability ratings for each sentence type ($\chi^2 = 174.595, p < .001$) with a mean rank of 277.64 for the grammatical group, 241.70 for the depictive group, 146.08 for the resultative group and 104.59 for the ungrammatical group.

The Mann-Whitney test adjusted with the Bonferroni correction was run for pairwise post hoc analyses. The results showed that monolinguals' acceptability ratings for the resultative group is significantly different from those for the depictive ($U = 2147.5, W = 6803.5, Z = -6.778, p < .001$) and the grammatical sentences ($U = 1459, W = 6115, Z = -9.188, p < .001$). The depictive and the grammatical sentences also differed from each other ($U = 3465, W = 8121, Z = -4.195, p < .001$). The ungrammatical sentences differed significantly from all the other sentence types. In short, all the sentence types differed significantly from each other in relation to how they are perceived by the monolingual group.

As in experiment three, the acceptability of the resultative group was considerably lower in comparison to both the grammatical and the depictive groups. Both the higher acceptability of the ungrammatical group and the lower acceptability of the resultative group seems to be a consequence of the lack of abnormal sentences in the experimental corpus. GRAPH 10 illustrates the results.

Graph 10 – Monolinguals’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.

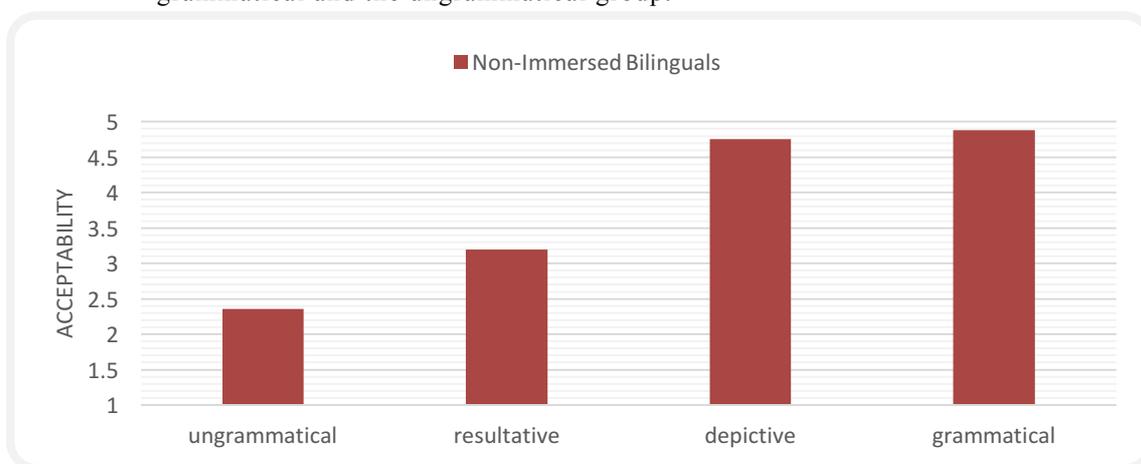


The Kruskal-Wallis test also showed that there was a statistically significant difference between the bilinguals’ acceptability ratings for different sentence types ($\chi^2 = 339.368$, $p < .001$). The mean rank was 451.86 for the grammatical, 434.55 for the depictive, 230.30 for the resultative and 165.29 for the ungrammatical sentences.

The Mann-Whitney test indicated that bilinguals’ acceptability ratings for the resultative sentences are significantly different from the acceptability ratings for the depictive ($U = 3936.5$, $W = 16816.5$, $Z = -11,525$, $p < .001$) and the grammatical sentences ($U = 3393.5$, $W = 16273.500$, $Z = -12.454$, $p < .001$). The depictive and the grammatical sentences did not differ significantly from each other ($U = 11796$, $W = 24676$, $Z = -2,048$, $p < .05$). The ungrammatical sentences differed significantly from all the other sentence types. Only the difference between the depictive and the grammatical

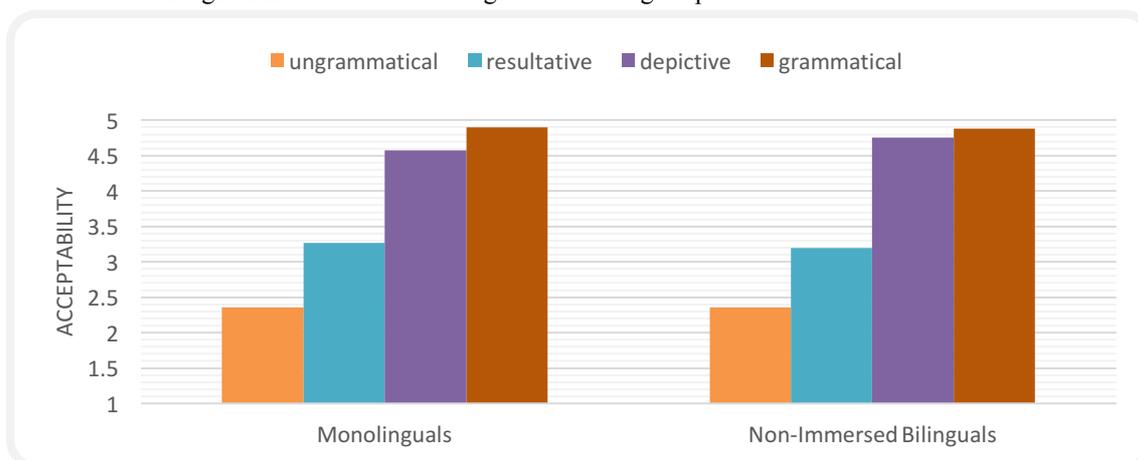
sentences was not statistically reliable. All the other sentence types differed significantly from each other and, hence, the results were very similar to the ones observed in experiment three. The absence of abnormal sentences in the corpus also increased the acceptability of the ungrammatical sentences and decreased the acceptability of the resultative sentences, as we expected. These results are illustrated in GRAPH 11.

Graph 11 – Bilinguals’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical group.



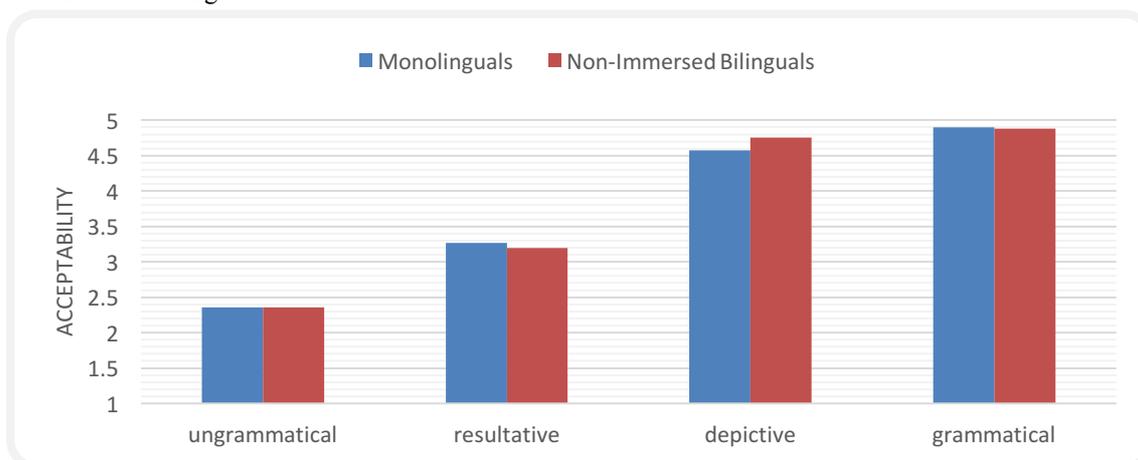
As we can observe in GRAPH 12, monolinguals and bilinguals displayed a similar behavior towards all the four sentence types. Next, we compared if there was any statistically reliable difference between monolinguals and bilinguals concerning each sentence types.

Graph 12 – Participants’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.



The results revealed that monolinguals and bilinguals did not differ significantly from each other as for the acceptability ratings for the resultative ($U = 7670.5$, $W = 12326.5$, $Z = -.017$, $p = .987$), the grammatical ($U = 7589$, $W = 20469$, $Z = -.320$, $p = .749$) and the ungrammatical sentence types ($U = 7659$, $W = 12315$, $Z = -.040$, $p = .968$). Nevertheless, they differed from each other in relation to the depictive sentences ($U = 6505.5$, $W = 11161.5$, $Z = -2.767$, $p < .01$). Therefore, the changes applied to experiment four did not change the fact that both groups exhibit similar acceptability for the resultative construction. Also, in experiment four, we observe that acceptability ratings for the resultative sentences were close to the ungrammatical sentences than they were to the depictive and grammatical sentences. The results are illustrated in GRAPH 13.

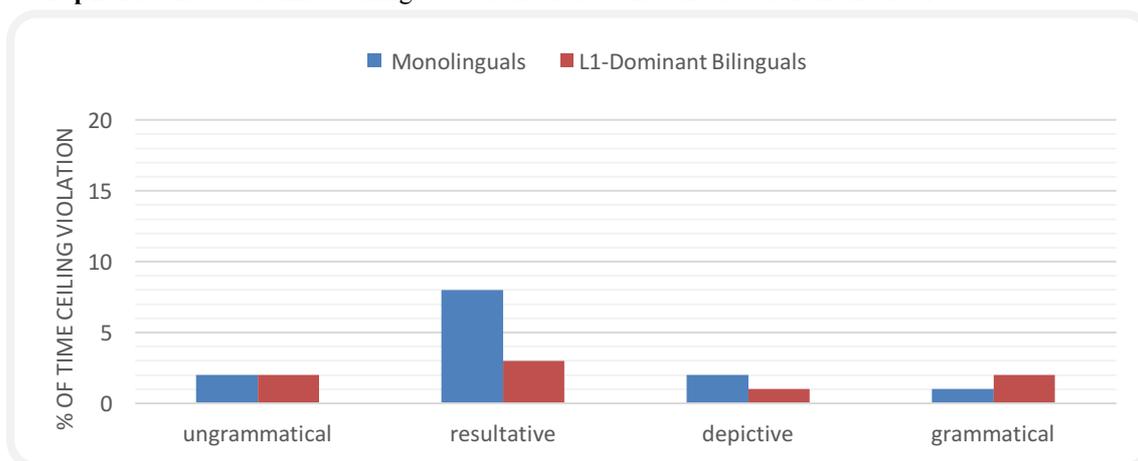
Graph 13 – Mean acceptability ratings given by monolinguals, non-immersed bilinguals and immersed bilinguals.



The overall pattern observed in experiments three and four is similar and both indicate that bilinguals and monolinguals exhibit similar acceptability for the structures analyzed in this study: intermediate acceptability for the resultative construction and high acceptability for the depictive construction. Therefore, the fact that participants in experiment two had performed the MT previously did not seem to change their behavior in the AJT. However, the changes in the ungrammatical sentences and in time ceiling had an effect on the results. As we suspected, the absence of abnormal sentences decreased the acceptability of the resultative group and the change in time ceiling resulted in fewer violations.

The results from experiment two suggest that the resultative construction imposes a high processing cost to monolinguals, but not to bilinguals. The rate time ceiling violations during the AJT in experiment three corroborated this analysis. As we can see in GRAPH 14, bilinguals exceeded the time ceiling only a few times in relation to all sentence types and so did the monolinguals, except towards the resultative group, since monolinguals violated the time ceiling in 8% of the sentences.

Graph 14 – Rate of time ceiling violations for each construction in the AJT.



As in experiment two and experiment three, the sentences that forced the resultative construction into BP seem to have imposed a high processing cost to monolinguals. This processing cost was much lower for bilinguals. Thus, the results from experiment two, three and four suggest that bilingualism can facilitate the processing, in the L1, of L2-specific argument structure constructions. The results from experiments three and experiment four aimed at answering the questions raised in experiment two about the nature of this effect of bilingualism on sentence processing in the L1. Our findings suggest that the apparent departure from L1 restrictions during online processing that was observed in experiment two is supported by a momentary co-activation of L1 and L2 representations and not by a change in the fundamental L1 grammar, since there was not any effect on the post-processing experiments (experiment three and experiment four).

In the next experiments, we will evaluate bilinguals' behavior towards the resultative construction in their L2.

4.7 Experiment five

Experiment five was a MT in English. The independent variables were the constructions – resultative, ungrammatical resultative and depictive – and the linguistic profiles of the participants – English monolinguals, non-immersed bilinguals and immersed bilinguals. The dependent variable was the participants' RTs for the AP in these constructions.

4.7.1 Participants

61 people voluntarily took part in experiment five. They were grouped into English monolinguals (23), non-immersed bilinguals (20) and immersed bilinguals (18). English monolinguals were residents of Madison/WI in the United States, non-immersed bilinguals were residents of Belo Horizonte/MG metropolitan area in Brazil and immersed bilinguals were residents of the Boston/MA metropolitan area in the United States. Participants were in average 26 years old ($SD = 5$) and their minimal level of education was some college or post-secondary coursework.

4.7.2 Materials

72 items constituted the experimental corpus of experiment five, which also had a training session with 10 sentences. Due to the nature of the experiment, only grammatical sentences were utilized, except for the sentences in the ungrammatical resultative group, whose last word was ungrammatical in English. As in experiment two, the MT in BP, the stimuli were pseudo-randomized and arranged in such a manner they were unlikely to be displayed in sequence.

One-third of the experimental stimuli were formed by target sentences and control sentences. There were eight sentences in each of the groups under scrutiny (resultative, ungrammatical resultative and depictive). The ungrammatical resultative sentences had the same structure used in the resultative sentences, the only difference was their APs which violated the event-argument homomorphism. The other groups contained sentences with a structure similar to the ones used in the previous experiments, as shown below:

109. Target sentences/ resultative construction in English:

- a. The cook twisted the spoon and hammered it flat.
- b. The driver watered the car and wiped it clean.
- c. The student grabbed the door and pulled it shut.
- d. The kid painted the paper and blew it dry.
- e. The woodworker cleaned the table and sanded it smooth.
- f. The coach got the gallon and filled it full.
- g. The girl opened the aquarium the drained it empty.
- h. The guitarist unrolled the cable and pulled it straight.

110. Target sentences/ ungrammatical resultative construction in English:

- a. The boy held the can and crushed it small
- b. The scientists picked the mouse and trained it tired
- c. The father refurbished the house and painted it beautiful
- d. The driver vacuumed the car and washed it shiny
- e. The kid grabbed his toy and twisted it broken
- f. The vet bought a dog and fed it sick

- g. The grandma hugged the cat and patted it sleepy
- h. The mother swept the floor and watered it slippery

111. Control sentences/ depictive construction in English:

- a. The man cut the carrot and ate it raw.
- b. The firefighter heard the cat and found it hurt.
- c. The student lost the tablet and found it broken.
- d. The eagle caught the fish and ate it alive.
- e. The kid grabbed the lasagna and ate it cold.
- f. The customer analyzed the motorbike and bought it new.
- g. The player washed the sock and used it wet.
- h. The teacher got the tea and drank it hot.

4.7.3 Procedures

Testing procedures for experiment five experiment five procedures were similar to those in experiment two, the MT in BP. After filling out the terms of informed consent (or *TCLE* in BP), participants underwent an instruction and a training session. DMDX pseudo-randomized the stimuli presentation and collected the RTs. The time limit for each pair of words was 4 seconds, as in experiment two and participants took a break halfway through the task. The experiment was fully conducted in English to bring participants as close as possible to a monolingual mode.

4.7.4 Results

The main hypotheses for experiment five was that bilinguals would not show increased reading time for the resultative AP (grammatical and ungrammatical) in their L1 as compared to their monolingual counterpart. This hypothesis originates from the successful acquisition of the syntactic-semantic mapping present in the resultative construction, which is predicted by all the theoretical background on learnability we discussed in section 3.7. Also, this hypothesis is in accordance with the idea that the Negative Evidence Hypothesis should not be extended to the processing level. The fixed value of α to reject the null hypothesis was .05. Mean RTs are shown in TAB. 10.

Table 10 – Mean RTs and standard deviation for the APs in the resultative, depictive and the ungrammatical resultative groups.

Type	Monolinguals	Non-immersed bilinguals	Immersed bilinguals
Resultative	867.9 (151.8)	1082.9 (296.3)	1023.3 (172.9)
Depictive	1011.6 (147.4)	1053.5 (248.5)	1034 (186)
Ungrammatical Resultative	1346.8 (299.5)	1379.3 (500.1)	1405.8 (297.5)

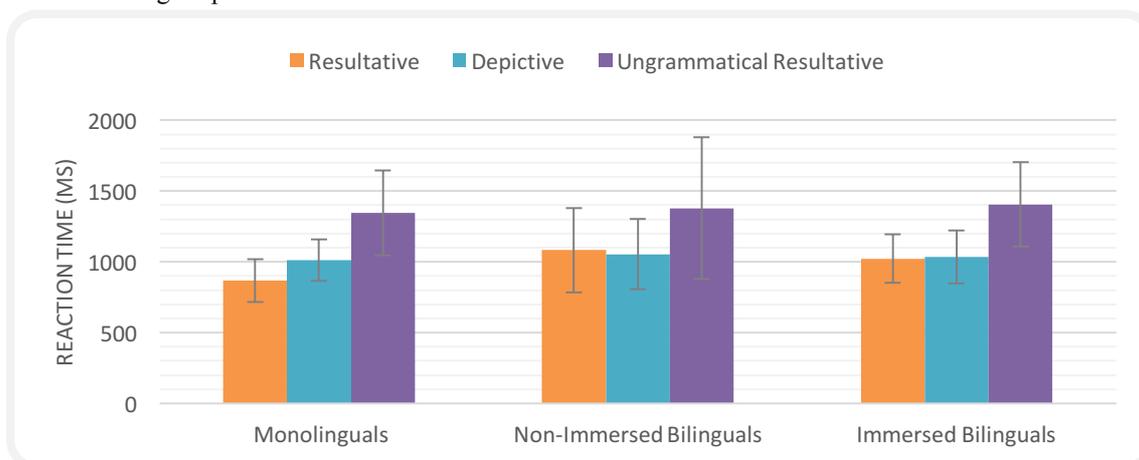
The Shapiro-Wilk test was used to test the RTs for normality. The monolinguals' means for the resultative ($W = .986$, $p = .989$), the depictive ($W = .957$, $p = .506$) and the ungrammatical resultative sentence types ($W = .945$, $p = .324$) did not differ from normal distribution. The same occurred with the non-immersed bilinguals' means for the resultative ($W = .932$, $p = .192$), the depictive ($W = .911$, $p = .078$) and the ungrammatical resultative sentence types ($W = .922$, $p = .086$). Immersed bilinguals' means for the resultative ($W = .982$, $p = .963$), the depictive ($W = .934$, $p = .206$) and the ungrammatical

resultative sentence types ($W = .900$, $p = .084$) did not differ significantly from the normal distribution either.

We utilized the one-way ANOVA to analyze the scores for each construction within each group of speakers. As for monolinguals, there was a significant main effect of sentence type ($F_1(2,66) = 30.988$, $p < .001$; $F_2(2,21) = 9.282$, $p < .001$) and post hoc tests adjusted with the Bonferroni correction indicated that the RTs for the ungrammatical resultative group was significantly different from both the resultative ($p < .001$) and the depictive sentences ($p < .03$). The difference between the two latter was not statistically reliable ($p = .73$). The ANOVA indicated a sentence type effect among non-immersed bilinguals as well ($F_1(2,57) = 4.721$, $p < .02$; $F_2(2,21) = 8.149$, $p < .01$). The post hoc analysis adjusted with the Bonferroni correction showed that the ungrammatical resultative sentences were once again significantly different from both the resultative ($p < .04$) and the depictive groups ($p < .03$), which did not differ from each other ($p = 1.0$). A similar sentence type effect was also noticed among the immersed bilinguals ($F_1(2,54) = 16.911$, $p < .001$; $F_2(2,21) = 15.426$, $p < .001$). Similarly to what was observed with the other two groups, the scores for the ungrammatical resultative sentences differed significantly from both the resultative ($p < .001$) and the depictive sentences ($p < .001$), which again did not differ from each other ($p = 1.0$).

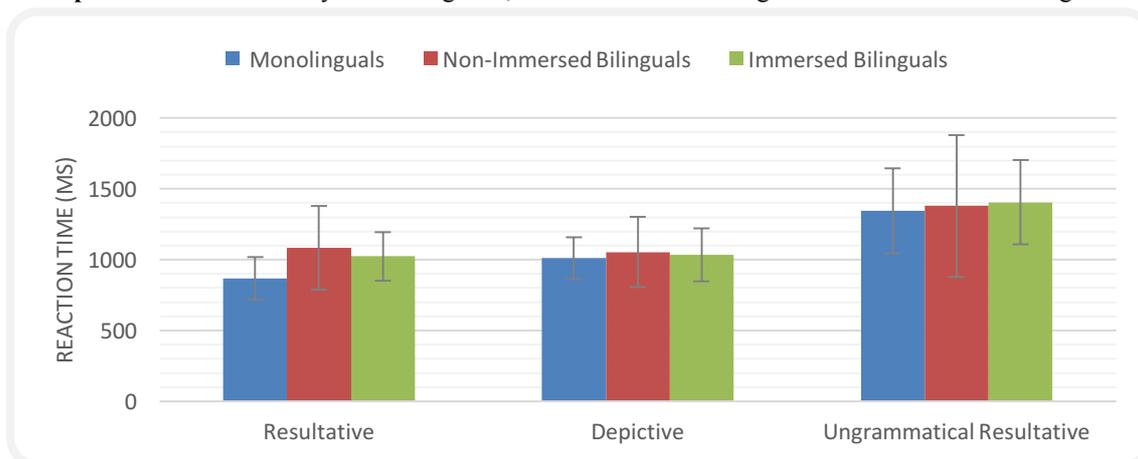
In sum, English monolinguals, non-immersed bilinguals and immersed bilinguals behaved alike. Their RTs for the APs in the resultative and in the depictive construction were similar. Also, their RTs for the APs in the ungrammatical resultative sentences were significantly longer in comparison to both the depictive and the resultative groups. The results are illustrated in GRAPH. 15.

Graph 15 – Mean RTs for the APs in the resultative, depictive and ungrammatical resultative groups.



The one-way ANOVA also revealed significant differences between speaker groups in the processing of the resultative construction ($F_1(2,59) = 5.813, p < .01$; $F_2(2,21) = 4.153, p < .03$). Post hoc analysis adjusted with the Bonferroni correction indicated that monolinguals differed significantly from non-immersed bilinguals ($p < .01$) and only marginally from immersed bilinguals ($p < .07$). The two groups of bilinguals did not exhibit a statistically reliable difference ($p = 1.0$). The one-way ANOVA also indicated that there was not any significant difference among the three groups of speakers in regards the depictive ($F_1(2,59) = .24, p < .79$; $F_2(2,21) = .161, p < .85$) and the ungrammatical resultative sentences ($F_1(2,59) = .13, p < .88$; $F_2(2,21) = .292, p < .75$). The results are illustrated in GRAPH 16.

Graph 16 – Mean RTs by monolinguals, non-immersed bilinguals and immersed bilinguals.



Overall, the results suggest similarities in processing costs for the depictive and the ungrammatical sentence types, but not for the resultative one. The two groups of bilinguals process the APs in the depictive construction, which is licensed in bilinguals' L1 and L2, as fast as English monolinguals do. Furthermore, the two groups of bilinguals also behaved similarly to the English monolinguals in relation to the ungrammatical resultative, which is unlicensed in bilinguals' L1 and L2. However, as for the resultative group, which is licensed in bilinguals' L2 (English), but not in their L1 (BP), English monolinguals were significantly faster in comparison to the non-immersed bilinguals. The results suggest that bilinguals are more likely to process constructions that have the same grammaticality status in both the L1 and the L2 in a more native-like manner. As for L2-specific constructions, the results suggest that bilinguals may be slower than monolinguals especially if they are not immersed in the L2.

4.8 Experiment six

We conducted experiment six with a SAJT in English. The independent variables were the construction type – resultative or depictive – and the participants' linguistic profile – English monolinguals, non-immersed bilinguals and immersed bilinguals. The

dependent variable was the acceptability judgments issued by the participants and the rate of time ceiling violations.

4.8.1 Participants

The same participants who took part in experiment five also completed experiment six. In total, there were 61 participants, which were grouped into English monolinguals (23), non-immersed bilinguals (20) and immersed bilinguals (18).

4.8.2 Materials

There were 96 items in the experimental corpus of experiment six SAJT plus 15 sentences in the training session. As in the previous AJTs, the sentences were balanced according to their grammaticality status and were pseudo-randomized in a manner that target and control sentences tended not to be displayed in sequence. There were eight sentences in each of the sentence types being observed: resultative, ungrammatical resultative and depictive. As in the previous SAJT, we also added a comparison group of test sentences with obviously grammatical sentences (grammatical) and another group with agreement mistakes (ungrammatical) in order to better understand the acceptability of the target groups. The structure of these five groups were similar to the ones used in the previous experiments that contained the same groups, as we can observe below:

112. Target sentences/ resultative construction in English:
- a. Paul cleaned the metal and hammered it flat.
 - b. The waiter tidied the table and wiped it clean.
 - c. Lucy checked the window and pulled it shut.
 - d. Laura painted her nail and blew it dry

- e. The driver opened the tank and filled it full
- f. The artist cut the wood and sanded it smooth.
- g. The plumber cleaned the pool and drained it empty
- h. The fireman tied the rope and pulled it straight

113. Target sentences/ ungrammatical resultative construction in English:

- a. The baby grabbed the paper and crushed it small.
- b. Ursula selected a horse and trained it tired.
- c. Tara cut the nail and painted it beautiful.
- d. The singer dyed her hair and washed it shiny.
- e. Josh found a spoon and twisted it broken.
- f. Rachel bought a cat and fed it sick.
- g. The vet hugged the dog and patted it sleepy.
- h. The maid swept the floor and watered it slippery.

114. Control sentences/ depictive construction in English:

- a. The chef cut the salmon and ate it raw.
- b. James lost his dog and found it dead.
- c. Junior lost his phone and found it broken.
- d. The cat caught the mouse and ate it alive.
- e. The student bought a pizza and ate it cold.
- f. Ron unloaded the box and brought it empty
- g. The athlete soaked his t-shirt and used it wet.
- h. Rose prepared the coffee and drank it hot

115. Grammatical in English:

- a. Jansen likes to play the guitar
- b. Jake hates math and history
- c. Alan studies Italian every day
- d. Hans speaks German very well
- e. The president loves his brother and his sister
- f. The kid plays video game every weekend
- g. The student uses the computer at night
- h. The pilot drinks coffee in the morning.

116. Ungrammatical in English:

- a. I likes dogs that don't bark
- b. We likes to work in a bank.
- c. I plays football twice a week.
- d. We plays video game on my computer.
- e. I has no trouble with my enemies.
- f. We has no school tomorrow morning.
- g. I eats all my calories at dinner.
- h. We eats a lot of fish with vegetables.

4.8.3 Procedures

The testing procedures for experiment six were similar to experiment three and four, except for the fact that the task was conducted in English. Before starting the task, participants underwent a training session with 15 sentences. The presentation time ceiling

for each sentence in this task was 6 seconds and participants took a break halfway through the task. Stimuli were presented and reaction times recorded with DMDX.

4.8.4 Results.

The main hypothesis for experiment six was that bilinguals would be as accepting of the resultative construction in English as monolinguals, except when the resultative construction was ungrammatical due to an unlicensed AP. In the latter case, bilinguals would be more accepting than monolinguals. Our hypothesis about bilinguals' behavior toward the grammatical resultative construction stems from the successful acquisition of the syntactic-semantic mapping of the resultative construction, which is supported by all the theoretical background on learnability discussed in section 3.7. As for the ungrammatical resultative construction, our hypothesis is based on the Negative Evidence Hypothesis, which predicts that bilinguals will not be as sensitive as monolinguals to grammatical restriction in the L2. The fixed value of α to reject the null hypothesis was .05. Post-hoc analyses with the Mann-Whitney test adjusted with the Bonferroni correction had different significance levels: .012 for comparisons between four groups and .01 for comparisons between five groups.

We excluded from analysis RTs that were shorter than 1ms on trials that were preceded by unjudged sentences in order to discard responses from participants who exceeded the time ceiling of a sentence and ended up assigning its acceptability rating to the next sentence. In total, 42 out of the 2440 acceptability ratings were discarded, which represents 2% of the entire dataset. Results from the data included in the analysis are presented in TAB. 10 and TAB.11.

Table 11 – Mean and median acceptability ratings given to the resultative, depictive, grammatical and ungrammatical groups in English.

Type	Monolinguals	Non-immersed bilinguals	Immersed bilinguals
Resultative	4,46 (5)	4,26 (5)	4,38 (4)
Depictive	4,37 (5)	4,61 (5)	4,51 (5)
Ung. Resultative	3,00 (3)	3,96 (4)	4,21 (5)
Grammatical	4,78 (5)	4,62 (5)	4,51 (5)
Ungrammatical	2,46 (2)	2,87 (2)	2,50 (2)

Table 12 – Rate of time ceiling violations for each construction in the AJT.

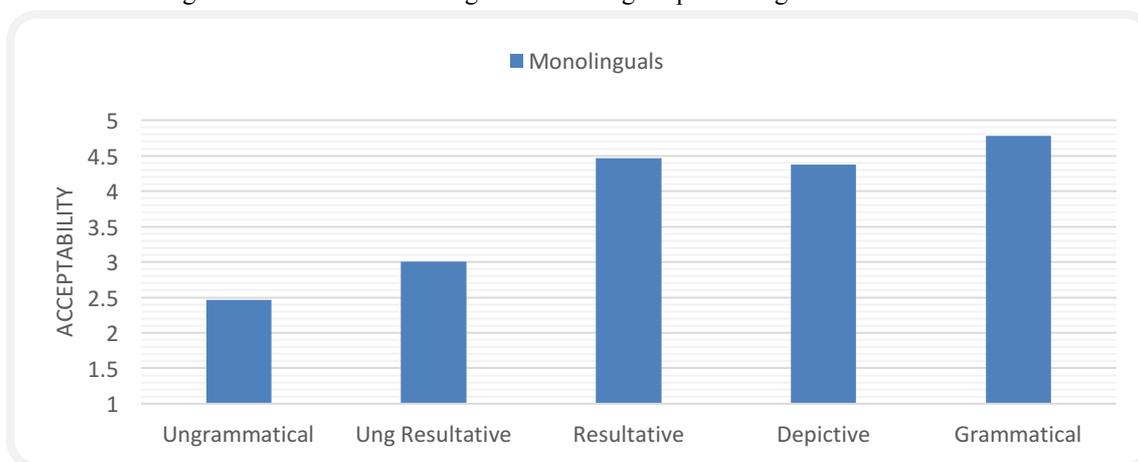
Profile	Resultative	Depictive	Ung. Resultative	Grammatical	Ungrammatical
Monolinguals	5%	2%	0%	3%	3%
Non-immersed bilinguals	4%	3%	4%	1%	2%
Immersed bilinguals	5%	2%	5%	1%	1%

The acceptability ratings were tested for normality with the Shapiro-Wilk test. The monolinguals' means for the grammatical group differed from the normal distribution ($W = .889, p < .04$). Their means for the resultative ($W = .953, p = .47$), the depictive ($W = .903, p < .07$), the ungrammatical resultative ($W = .978, p = .93$) and the ungrammatical sentences did not differ from the normal distribution ($W = .917, p = .12$). The non-immersed bilinguals' means for the grammatical ($W = .673, p < .001$) and the depictive sentences ($W = .870, p < .02$) differed from the normal distribution. Their means for the resultative ($W = .932, p = .21$), the ungrammatical resultative ($W = .951, p = .45$) and the ungrammatical sentences did not differ from the normal distribution ($W = .954, p = .48$). The immersed bilinguals' means for the resultative ($W = .843, p < .01$), for the depictive ($W = .865, p < .02$), for the ungrammatical resultative ($W = .814, p < .01$) and for the grammatical sentences ($W = .749, p < .001$) differed from the normal distribution. Their means for the ungrammatical sentences ($W = .967, p = .73$) did not differ from the normal distribution.

Due to the non-normality of part of the data, we utilized the Kruskal-Wallis test to compare the differences in acceptability ratings within each group of speakers. The Kruskal-Wallis test showed that there was a significant difference between the monolinguals' acceptability ratings for each sentence type ($\chi^2 = 405.928$, $p < .001$) with a mean rank of 600.73 for the grammatical, 527.33 for the resultative, 515.40 for the depictive, 269.81 for the ungrammatical resultative and 196.14 for the ungrammatical sentences.

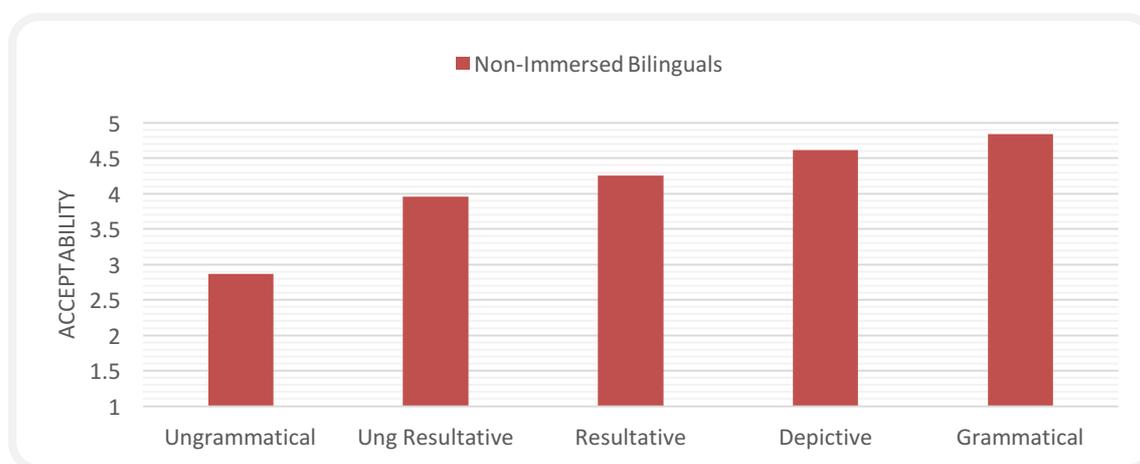
We utilized the Mann-Whitney test adjusted with the Bonferroni correction for pairwise post hoc analyses. The results indicate that monolinguals' acceptability ratings for the resultative and the depictive sentences did not yield a significant difference ($U = 13431.5$, $W = 27627.5$, $Z = -.454$, $p = .650$). The acceptability ratings for the ungrammatical resultative sentences differed significantly from the acceptability ratings for the resultative ($U = 4653$, $W = 18849$, $Z = -10.877$, $p < .001$) and the depictive sentences ($U = 5216.5$, $W = 19412.5$, $Z = -10.838$, $p < .001$). The scores for the grammatical sentences and the ones for the ungrammatical sentences differed significantly from all the other sentence types. The results are illustrated in GRAPH 17.

Graph 17 – Monolinguals' mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups in English.



The Kruskal-Wallis test indicated a statistically reliable difference among the non-immersed bilinguals' acceptability ratings ($\chi^2 = 250.907$, $p < .001$). The mean rank was 522.04 for the grammatical, 470.38 for the depictive, 394.46 for the resultative, 333.35 for the ungrammatical resultative and 191.35 for the ungrammatical sentences. The Mann-Whitney test adjusted with Bonferroni correction indicated that non-immersed bilinguals' acceptability ratings for the resultative sentences are significantly different from both the depictive ($U = 8954.5$, $W = 20129.5$, $Z = -3.838$, $p < .001$) and the ungrammatical resultative sentences ($U = 9364.5$, $W = 21145.5$, $Z = -2.865$, $p < .01$), which also differ from each other ($U = 7202$, $W = 18.983$, $Z = -6.537$, $p < .001$). The grammatical and the ungrammatical sentences differed significantly from all the other sentence types. The results are illustrated in GRAPH 18.

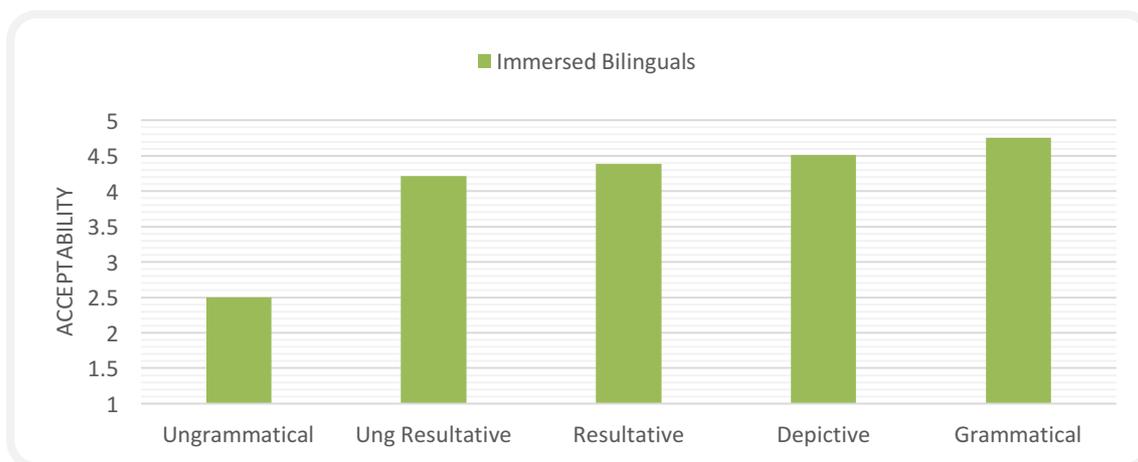
Graph 18 – Non-immersed bilinguals' mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups in English.



The Kruskal-Wallis test also indicated that there was a significant difference between the immersed bilinguals' judgments for each sentence group ($\chi^2 = 204.599$, $p < .001$) with a mean rank of 435.29 for the grammatical, 399.11 for the depictive, 373.20 for the resultative, 335.85 for the ungrammatical resultative and 163.50 for the

ungrammatical sentences. The Mann-Whitney test adjusted with the Bonferroni correction indicated that immersed bilinguals' acceptability ratings for the resultative sentences did not differ significantly from the acceptability ratings for the depictive sentences ($U = 8276.5$, $W = 17.187.5$, $Z = -1.540$, $p = .124$) and it differed only marginally from the ungrammatical resultative sentences ($U = 7354$, $W = 15355$, $Z = -1.962$, $p < .06$). Moreover, the depictive sentences did not differ significantly from the grammatical sentences ($U = 8816.5$, $W = 18132.5$, $Z = -1.535$, $p = .125$). All the other comparison yielded statistically reliable differences. The results for immersed bilinguals are illustrated in GRAPH 19.

Graph 19 – Immersed bilinguals' mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups in English.

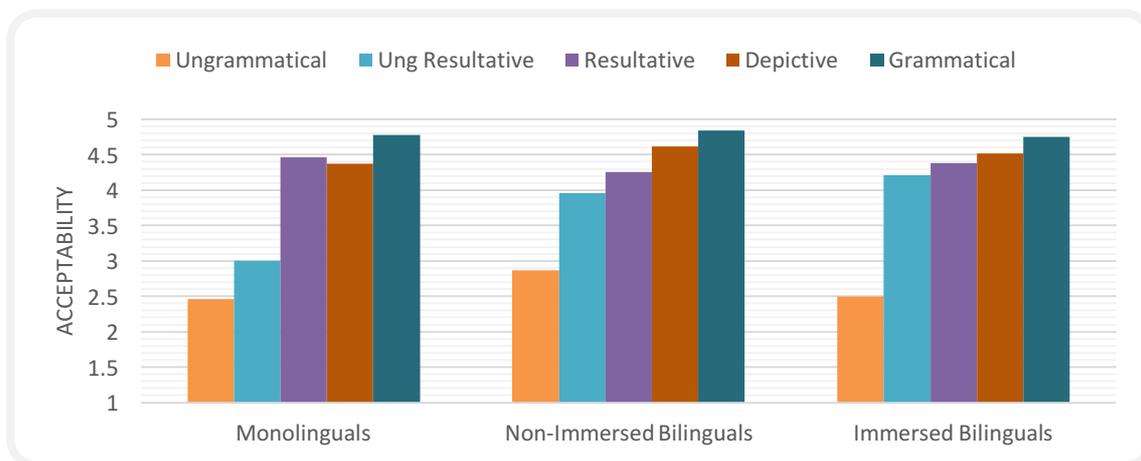


Bilinguals' acceptability ratings for the depictive and the ungrammatical resultative sentence types warrant further discussion. Non-immersed bilinguals judged the depictive construction as significantly more acceptable than the resultative construction. This difference was not observed among immersed bilinguals or monolinguals. The non-immersed bilinguals lived in a context in which BP is the dominant language for social interactions and, since BP licenses the depictive but not the resultative construction, it is possible to conjecture that their acceptability ratings exhibit

some L1-to-L2 influence. Interestingly, this effect was not observed among the bilinguals who are immersed in a language in which the two constructions have the same acceptability.

Furthermore, when we compared each group’s mean rank for the resultative and the ungrammatical resultative group, we perceived that monolinguals distinguish the two constructions much more clearly than bilinguals do. In fact, immersed bilinguals exhibited only a marginal difference. In addition, monolinguals’ displayed the lowest difference between the ungrammatical resultative and the ungrammatical group. Consequently, these findings suggest that immersion results in a native-like behavior in acceptability judgment of both the resultative and the depictive construction. but it also increases the overgeneralization of the resultative predicate rules. The results are summarized in GRAPH 20.

Graph 20 – Participants’ mean acceptability ratings given to the resultative, the depictive, the grammatical and the ungrammatical groups.



We also compared the differences between monolinguals, non-immersed bilinguals and immersed bilinguals towards each sentence group. The Kruskal-Wallis test indicated that the difference concerning the acceptability ratings for the resultative

construction was only marginal ($\chi^2 = 5.768$, $p < .06$) with a mean rank of 236.00 for immersed bilinguals, 229.39 for monolinguals and 205.86 for non-immersed bilinguals. The three groups also did not differ significantly in relation to their acceptability ratings for grammatical sentences ($\chi^2 = 1.268$, $p = .53$) with a mean rank of 235.84 for non-immersed bilinguals, 231.39 for monolinguals and 225.30 for immersed bilinguals.

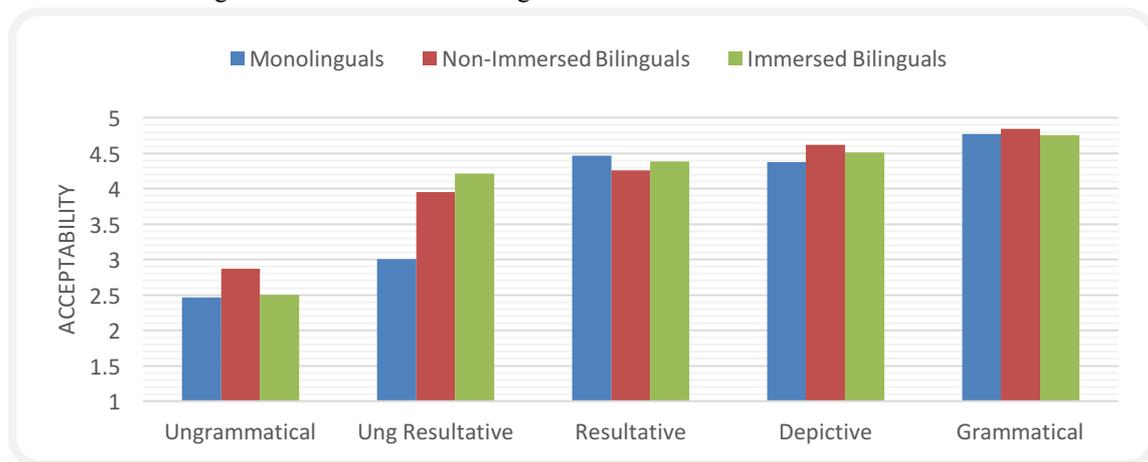
As for the depictive construction, the Kruskal-Wallis indicated that there was a statistically reliable difference ($\chi^2 = 9.975$, $p < .01$) with a mean rank of 244.47 for immersed bilinguals, 238.80 for non-immersed bilinguals and 208.86 for monolinguals. Post hoc analyses with the Mann-Whitney test adjusted with the Bonferroni correction revealed that monolinguals differed from both non-immersed bilinguals ($U = 11192$, $W = 25389$, $Z = -2.496$, $p < .016$) and immersed bilinguals ($U = 97.000$, $W = 23.896$, $Z = -2.741$, $p < .01$), whereas the latter two groups did not differ from each other ($U = 10160$, $W = 22095$, $Z = -.574$, $p = .566$).

The Kruskal-Wallis also revealed a significant difference in acceptability ratings for the ungrammatical resultative group ($\chi^2 = 85.337$, $p < .001$) with a mean rank of 281.79 for immersed bilinguals, 251.59 for non-immersed bilinguals and 155.53 for monolinguals. The Mann-Whitney test showed that monolinguals differed from both non-immersed bilinguals ($U = 7048$, $W = 21244$, $Z = -7.214$, $p < .001$) and immersed bilinguals ($U = 4885$, $W = 19081$, $Z = -8.150$, $p < .001$), who also differed from each other ($U = 8057$, $W = 19838$, $Z = -2.519$, $p < .016$).

The acceptability ratings for the ungrammatical sentences also yielded a statistically reliable difference ($\chi^2 = 9.111$, $p < .02$) with a mean rank of 259.77 for the non-immersed bilinguals, 224.26 for the monolinguals and 217.48 for the immersed bilinguals. Post hoc analyses indicated that non-immersed bilinguals differed from both monolinguals ($U = 11022.5$, $W = 25728.5$, $Z = -2.690$, $p < .01$) and immersed bilinguals

($U = 9163$, $W = 19174$, $Z = -2.468$, $p < .02$), whereas the latter two groups did not differ from each other ($U = 11490.5$, $W = 21.501.5$, $Z = -.734$, $p < .436$). These results are illustrated in GRAPH 21.

Graph 21 – Participants’ mean acceptability ratings given by monolinguals, non-immersed bilinguals and immersed bilinguals.

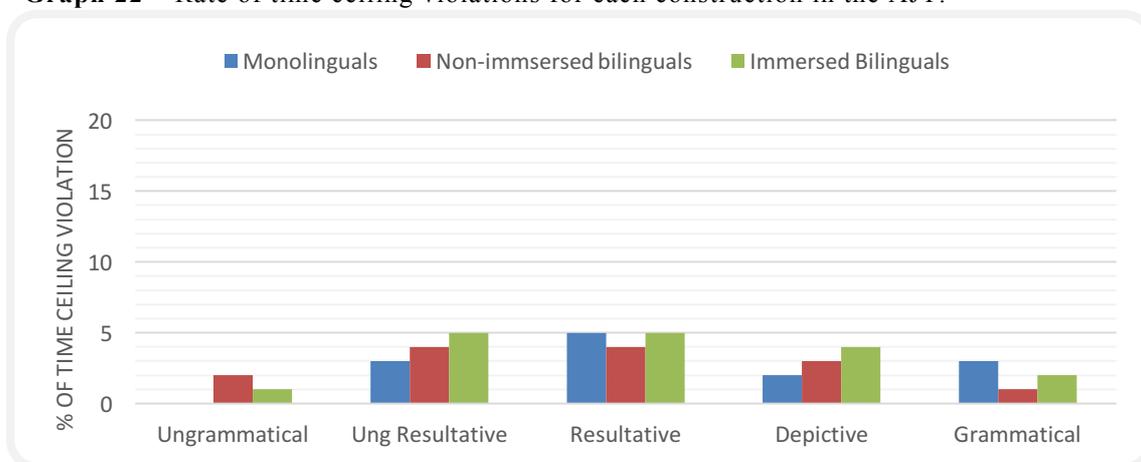


These results altogether suggest some interesting similarities and differences between the three groups of speakers. The groups did not differ significantly in their acceptability ratings for the resultative construction. This suggests that both immersed and non-immersed bilinguals successfully learned the resultative construction, as predicted by the theoretical background on learnability discussed in section 3.7. However, as predicted by the Negative Evidence Hypothesis, bilinguals are less sensitive than monolinguals are as to the restrictions in the resultative predicate. As we noted in the within-group analysis, immersion does not enhance this sensitivity. In addition, in the between-group analysis, it was shown that non-immersed bilinguals are less sensitive than the other two groups to the agreement violations present in the ungrammatical group. Moreover, non-immersed bilinguals exhibited better metalinguistic skills to analyze the grammatical and ungrammatical groups in the BP tasks, but not in the English tasks. In

sum, bilinguals appear to have learned what is licensed in their L2, but the acquisition of what is unlicensed in the L2 was not as successful.

We also measured the rate of time ceiling violations in Experiment 6. However, it seems that the increase in time-ceiling compared to Experiment 3 decreased the informativeness of this analysis. As we can observe in GRAPH 22, the rate of time ceiling violations was low and did not show much variance between the groups.

Graph 22 – Rate of time ceiling violations for each construction in the AJT.



Having presented all six experiments that make up this Ph.D. dissertation, we go on to discuss the implication of our findings in relation to our theoretical background.

5. Discussion

This study aimed at investigating the possible consequences of BP-English bilinguals' acquisition of the resultative construction. First, we analyzed if bilingualism was capable of generating changes in bilinguals' L1 processing routines and in their L1 overall grammar. After that, we inspected whether bilinguals also acquired the restrictions present in the resultative construction. Therefore, our study focused on (i) the bilingualism effects on L1 processing and representation and (ii) learnability of L2-specific argument structure constructions.

In this section, we discuss the results obtained from these experiments in light of the theoretical background presented in chapters two and three. In short, experiment one showed the higher acceptability of the clitic pronouns as direct objects as compared to the tonic pronouns in the same context, which enabled us to select the best structure for our target items in the following experiments. Experiment two indicated that highly proficient BP-English bilinguals, unlike BP monolinguals, did not exhibit high processing costs for the AP in the resultative construction in BP. The results of experiment three and four suggest that there is no significant difference between highly proficient BP-English bilinguals and BP monolinguals as to the acceptability of the resultative construction in BP. Experiment five revealed that highly proficient BP-English bilinguals and English monolinguals processed the AP in the resultative construction in English as fast as they processed the AP in the depictive construction. Furthermore, bilinguals and monolinguals exhibited longer reading times when processing the APs in the ungrammatical resultative sentences. Experiment six demonstrated that BP-English bilinguals and English monolinguals judge the acceptability of the resultative construction in English in a similar manner, but bilinguals were more accepting of the ungrammatical resultative sentences in comparison with monolinguals.

The data obtained from experiment one contributes to the discussion on which third-person pronouns should be used in psycholinguistic experiments. Tarallo (1996) points out that 3P clitic pronouns are not used in BP in the direct object position anymore. Consequently, some psycholinguists, according to Maia & Lima (2014), have chosen to use 3P tonic pronouns as direct objects in experimental items. Nevertheless, Corrêa (1991) provides robust evidence that speakers with higher levels of education tend to produce 3P clitic pronouns more than they produce 3P tonic pronouns especially in the written modality. Moreover, Maia & Lima (2014) indicated that BP speakers with higher levels of education also process the 3P clitics faster than they processed 3P tonic pronouns in written sentences. Our results from experiment one reveal that for speakers with high levels of education the 3P clitic pronouns are also perceived as more acceptable than the 3P tonic pronouns. Therefore, notwithstanding the frequent use of 3P tonic pronouns in the spoken modality, the 3P clitic pronouns seem to be the most suitable pronominal form for reading tasks with speakers with high levels of education.

The data obtained in experiment one is in accordance with the principles of the Multiple-Grammars perspective, which assumes that speakers do not delete previous rules when they add new rules to their grammatical repertoire. Instead, they accommodate both the new and previous rules in their linguistic system and (re)assess these rules productivity. Corrêa's (1991) study indicated that the preference for pronouns varies according to speakers' level of education and that college students have a preference for 3P clitic pronouns. However, our results indicate that, despite this preference, college students give high acceptability ratings to both clitic and tonic pronouns. This behavior is in accordance with the proposal of Multiple-Grammars that speakers can accommodate different or even contradictory rules and evaluate their productivity.

In addition to assisting us in choosing the best pronoun for the experimental items of this study, the results also legitimized the findings of previous studies whose target sentences were instances of the resultative construction with 3P clitic pronouns (OLIVEIRA, 2013; 2015; SOUZA et al, 2014; OLIVEIRA; MARCELINO, 2014). Thus, we have evidence that the 3P clitic pronouns as direct objects should not be pretermitted in experimental items of (psycho)linguistic reading tasks whose participants have higher education.

Having defined the best structure for target and control items, we set off to carry out the remaining experiments, aiming to explore some of the possible influences of bilingualism on the L1. In order to cast light on this issue, we ran a MT and two SAJTs. Whereas in the MT we measured only the participants' RTs, in the SAJT we measured participants' acceptability ratings and rate of time ceiling violations.

In the introductory chapter of this dissertation, we proposed two hypothesis concerning the possible changes in the L1 caused by bilingualism:

- a. Compared to BP monolinguals, BP-English bilinguals with high proficiency will exhibit a lower processing cost in the L1 for sentences that force the resultative construction.
- b. Compared to BP monolinguals, BP-English bilinguals with high proficiency will give higher acceptability ratings to sentences in the L1 that force the resultative construction in comparison to BP monolinguals.

Our findings confirm the first hypothesis (a) and refute the second one (b). In other words, in comparison to BP monolinguals, both groups of bilinguals displayed a processing cost towards the resultative construction that is significantly lower than the

processing cost exhibited by monolinguals, but bilinguals did not give higher acceptability ratings for the same construction.

The results obtained in experiment two suggest that the two groups of bilinguals processed the resultative construction in BP significantly faster than BP monolinguals did. In fact, the comparison between the data from the resultative and the depictive construction indicated that the resultative predicate imposed an extra processing cost on BP-monolinguals, an effect that was considerably smaller on both non-immersed and immersed bilinguals. These results are also corroborated by the data from experiment three and four, which revealed that monolinguals, compared to bilinguals, had a considerably higher tendency to violate the time limit on the SAJTs when they read the sentences that forced the resultative construction into BP.

These findings are in consonance with recent findings that suggest the impossibility of L1 isolation even during tasks that do not require use the L2 (KROLL et al., 2006; SOUZA; 2012). The results of this study are similar to those in Souza (2012), who conducted a study that also addressed the processing of an L2-specific construction by bilinguals. The author conducted a SPR to observe the BP-English bilinguals' RTs for induced movement alternation sentences, such as (100) and (101). The results indicated that bilinguals with higher proficiency, despite L1 restrictions, did not exhibit extra processing costs for this construction in the L2. More importantly, the same processing cost was maintained when they processed similar sentences in BP. BP monolinguals, on the other hand, exhibited a significantly higher processing cost. The results are interpreted as evidence of access to the L2 during linguistic processing in the L1. Similar results are also discussed in (SOUZA; OLIVEIRA, 2011)

117. The trainer jumped the lion through the hoop.

(SOUZA, 2012, p. 231)

118. *O domador pulou o leão pela argola.*

The tamer jump(PST) DET lion through-the hoop.

‘The tamer jumped the lion through the hoop’

Our findings are relevant for the understanding of the possible integration of languages in the bilingual mind. The data was obtained in a task that was fully conducted in a monolingual mode and so it suggests that bilinguals can activate L2 information even in contexts that favors L2 deactivation, as suggested by Grosjean (2013). Similarly to Dussias & Sagarra (2007) and Souza (2012), our study demonstrates that cross-linguistic influence seems to be a two-way process. These findings are essential for maintaining the possibility of interaction between the L1 and the L2 in the bilingual mind since changes in behaviors in the L1 do not seem to be related to a strategic behavior to explore possible equivalence between the L1 and the L2. Therefore, our results seem to corroborate the Multi-Competence hypothesis by presenting data that illustrates how bilinguals can process L1 differently from monolinguals.

As described in section 3.1, the permanent co-activation of the L1 and the L2 in the bilingual brain has been argued to be one of the possible reasons why bilinguals tend to outperform monolinguals in tasks that demand certain cognitive skills. More specifically, the fact that bilinguals have to inhibit one language constantly in order to use the other has been claimed to be the source of purported enhancements to bilinguals’ cognitive system. Our results contribute to this hypothesis by demonstrating the existence of this co-activation of languages.

Cross-linguistic influence has been investigated mostly in relation to the lexicon. At the lexical level, there is robust evidence that corroborates the existence of interaction

between the L1 and the L2 in the bilingual mind. Hartsuiker & Pickering (2008), for example, report several studies whose data indicate cross-linguistic influence. Accordingly, the main theoretical models of bilingual lexical access, the RHM and the BIA+, account for this intercommunication between languages. At the syntactic level, evidence about the interaction between languages is not as robust, in spite of the fact that it is considered in most important theoretical models.

Our findings can be important to add some information to these models. The proposals of Hartsuiker et al. (2004) and Salamoura & Williams (2007) about bilingual representation at the syntactic level stress that the combinatorial nodes are shared only when the two languages have structural similarities. Our results suggest that bilinguals are able to use the L2 parsing strategies in the processing of the resultative construction in the L1, which suggests the possibility of combinatorial nodes being shared even in cases of language-specific argument structure constructions. Bernolet et al. (2013) and the empirical evidence in Souza (2012) had already suggested this possibility. Thus, these results show that the kinds of information shared by the L1 and the L2 can be, in fact, more diverse than previously thought.

The acceptability ratings elicited in experiment three showed no significant differences between monolinguals and bilinguals. The results indicate that all participants had the same trend to judge the resultative construction as less acceptable than the depictive constructions. We expected this result from the monolingual participants since previous studies (OLIVEIRA; MARCELINO, 2014; MARCELINO, 2014) suggest that the resultative construction is illicit in BP. However, our hypothesis was that the bilingual participants would give higher acceptability ratings to the resultative construction due to the facilitation in processing observed in experiment two.

The fact that our results are at odds with our hypothesis apparently contradicts the findings about linguistic processing. Notwithstanding this first impression, we understand these findings can also be interpreted as complementary to the data about the online processing of the resultative predicate. When we observe the behavior of a bilingual speaker in the L1, especially in the monolingual mode, we barely notice traces of the L2. Nevertheless, the latest research on the organization of languages in mind point convincingly that all languages remain active during language processing (BIALYSTOK, 2005). If the two languages are mutually active and even share representational regions as evidenced by neuroimaging studies reported by Bialystok, bilinguals must use an inhibitory system that is able to prevent intrusions from the unwanted language. Thus, the evidence that bilinguals with high proficiency seem to access the L2 while processing the L1 and behave as monolinguals in a SAJT, can be explained by the existence of this highly efficient inhibitory system.

Our results suggest that participants processed an L2-specific argument structure without additional costs. However, this activation did not extend to their metalinguistic awareness and, hence, they were able to judge these same sentences similarly to the manner monolinguals did. We understand that this difference indicates that bilingualism effects on the L1 exist, but are short-lived and act primarily on speakers' implicit knowledge. In sum, our findings seem to support previous claims that the inhibitory control has an important role in the bilingual mind.

The AJT results are also in accordance with the principles of the Multiple-Grammars perspective. As discussed in section 3.7, Amaral & Roeper (2014) maintain that L2 acquisition involves the addition of new rules in bilinguals' grammatical repertoire and the (re)assessment of the different rules' productivity. In the case of the resultative construction, for instance, BP-English bilinguals add this new construction to

their grammar and analyze its productivity in both languages. Thus, we can conclude that the MT results are evidence that the resultative construction sub-grammar is present in bilinguals' L1 representation and that the SAJT results are evidence that bilinguals successfully perceived the unproductivity of this argument structure construction in BP.

As for the processing, representation and learnability of the resultative construction in English, we proposed the following hypotheses:

- c. Compared to English monolinguals, BP-English bilinguals with high proficiency will not exhibit a different processing cost in the L2 for the resultative construction (grammatical or ungrammatical).
- d. Compared to English monolinguals, BP-English bilinguals with high levels of proficiency will not give different acceptability ratings to the resultative construction, except when it is ungrammatical.

The results refute partially the third hypothesis (c) and they confirm the fourth hypothesis (d). More specifically, both immersed and non-immersed bilinguals behaved similarly to English monolinguals in the MT towards the ungrammatical resultative sentences. However, English monolinguals were significantly faster than non-immersed bilinguals to process the resultative predicate. Immersed bilinguals did not differ from non-immersed bilinguals and they differed only marginally from monolinguals. In the SAJT, bilinguals did not differ from monolinguals in regards to the acceptability of the resultative group, but they displayed higher acceptability towards the ungrammatical resultative group, as we expected.

The learnability perspectives discussed in section 3.7 (Subset Principle, Bottleneck Hypothesis, Interface Hypothesis and Multiple-Grammars) suggest that BP-

English bilinguals can successfully learn the resultative construction. The MT data indicate that both bilinguals and monolinguals processed the AP in the resultative construction as fast as they processed the AP in the depictive construction. We interpret these results as a strong evidence that BP-English bilinguals are capable of acquiring the resultative construction. However, the data also shows that non-immersed bilinguals took longer than monolinguals to process the resultative construction, whereas the difference between immersed bilinguals and monolinguals was not statistically reliable. This difference suggests that immersion can positively influence the acquisition of L2-specific argument structure.

The data on the SAJT in experiment six corroborate this line of thought as well. English monolinguals, immersed bilinguals and non-immersed bilinguals did not differ significantly in regards to the acceptability of the resultative construction. We believe that this similarity in behavior also provides an important evidence that BP-English bilinguals can learn the resultative construction. Nevertheless, as in the MT, non-immersed bilinguals exhibited a peculiar behavior, namely, they were the only group that perceived the depictive construction as being significantly more acceptable than the resultative construction. Taken altogether these results suggest that the resultative construction can be acquired by BP-English bilinguals and that immersion can enhance this learning process.

Bilinguals exhibited a behavior in the English tasks that suggest that they are capable of correctly mapping the resultative construction. However, bilinguals' behavior towards the ungrammatical resultative sentences indicates that they are not as sensitive as monolinguals as to the restrictions in L2-specific argument structure constructions.

The findings originating from the MT robustly indicates that a resultative sentence whose AP does not follow the event-argument homomorphism imposes an extra

processing cost in comparison to the cost imposed by the AP in a regular resultative or depictive construction. It is worth noting that this higher processing cost was not only observable amongst monolinguals but also amongst bilinguals.

Despite this similar processing cost, bilinguals differed significantly from monolinguals in relation to the acceptability of the ungrammatical resultative sentences in the SAJT. The contrast between grammatical and ungrammatical resultative sentences is much more evident amongst monolinguals than it is amongst bilinguals. In other words, bilinguals and monolinguals did not exhibit a difference in acceptability ratings towards the resultative group, but bilinguals assigned significantly higher acceptability ratings to ungrammatical resultative sentences.

The NEH predicted this behavioral pattern. It assumes that bilinguals are more prone to accept a new structure in the L2 as grammatical and try to figure out its most suitable interpretation as compared to the monolingual native speakers of the same language. If the sentence is ungrammatical bilinguals may exhibit an additional processing cost, but they are not likely to reject the sentences as much as monolinguals are, unless they have been exposed to the appropriate negative evidence. Taking into consideration that bilinguals are unlikely to receive negative evidence regarding the resultative predicate event-argument homomorphism, we believe that our results corroborate the NEH. Therefore, our results corroborate the NEH idea that bilinguals' use the absence of evidence as evidence of absence less often than monolinguals do. In addition, this class of findings also lends support to the hypothesis that monolinguals exhibit a more bottom-up acquisition, whereas bilinguals tend to acquire the L2 in a more top-down manner. This possible difference can explain why monolinguals are sensitive to subtle rules such as the restrictions in the resultative predicate and why bilinguals show a higher tendency of overgeneralizing these rules.

It was also observed that immersion played a positive role in regards to bilinguals' behavior toward the resultative construction, but not towards the ungrammatical resultative construction. In fact, the SAJT in experiment six indicates that immersed bilinguals show a higher acceptability for the ungrammatical resultative construction as compared to both non-immersed bilinguals and English monolinguals. Furthermore, immersed bilinguals were the only group whose difference between the resultative and the ungrammatical resultative groups was not statistically reliable. Thus, immersion makes bilinguals behave similarly to English monolinguals toward the resultative construction, but it also increases the overgeneralization of the resultative predicate rules. These results robustly corroborate the NEH by demonstrating that even bilinguals who exhibited native-like behavior toward an L2-specific construction tend to be less sensitive than monolinguals as to the restrictions imposed by the same construction.

These findings are relevant to current theoretical questions about the limits of L2 ultimate attainment. It has been claimed that bilinguals exhibit difficulty acquiring aspects of the L2 that involve restraining the L1 grammar (OKAMOTO, 2009), the pragmatics-syntax interface (SORACE; FILLIACI, 2006; SORACE; SERRATRICE, 2009; SORACE, 2011) and functional morphology (SLABAKOVA, 2014). Our study proposes that acquiring L2-specific restrictions is also a daunting task for bilinguals. This issue deserves further exploration due to its relevant implications for fields such as translation, editing and second language learning.

To summarize, the investigation of the four hypothesis proposed in the present study corroborates a corollary of the Multi-Competence perspective. According to this view, bilingualism entails a state of linguistic knowledge that does not correspond to either to L1 or L2 norms. Our results suggest that highly proficient bilinguals can differ from the monolinguals of their L1 in regards to the processing of L2-specific structures.

Moreover, highly proficient bilinguals also seem to be less sensitive than the monolinguals of their L2 as to L2-specific restrictions. In sum, as predicted by the Multi-Competence hypothesis, bilingualism results in a unique linguistic system that differs from both L1 and L2 norms.

This study also brings up information concerning the grammar of BP. In consonance with previous studies (OLIVEIRA, 2013; OLIVEIRA; MARCELINO, 2014, MARCELINO, 2014), our data shows that the true resultative construction is not licensed in BP. In experiment two, we observed that the resultative construction was considerably costly in terms of processing for BP monolinguals. Moreover, the acceptability ratings in experiment three and four indicated that BP monolinguals perceived the resultative construction as being significantly less acceptable than the depictive and the grammatical sentence types. Therefore, the resultative construction can be considered a valuable tool in exploring bilingualism effects on BP-English bilinguals in both the L1 and the L2, since this construction has a different grammatical status in each of these languages.

As regards the resultative construction in English, our results corroborated Wechsler's (2001; 2005a; 2005b; 2012) proposal concerning the resultative predicate. The MT in experiment five indicates adjectives that do not follow the event-argument homomorphism generates significantly longer RTs in English monolinguals. Also, English monolinguals' acceptability ratings in experiment six shows that these adjectives are perceived as less acceptable than the licensed adjectives. Therefore, our results support Wechsler's (2012) claim that the resultative construction tends to be formed by closed-scale adjective with a maximum endpoint.

We can also address some methodological aspects observed in our study. First, it is noticeable that the MT and the SAJT can generate different patterns of results. In the BP tests, we noticed that bilinguals differed significantly from monolinguals in regards

to the resultative construction in the MT, but not in the SAJT. Also, in the English tests, bilinguals and monolinguals differed significantly in their responses to the ungrammatical resultative in the SAJT, but not in the MT. The differences between the data originated from the two aforementioned methods suggest that the imposition of a time ceiling on the second task does not change its offline nature, i.e., the SAJT is also a task that generates post-processing data. These results are consistent with Gutiérrez (2013)'s argument that judgments made on ungrammatical sentences tap into explicit linguistic knowledge. Also, it is important to note that the results from our speeded AJT are very similar to Oliveira (2013)'s results from a non-speeded AJT.

The different protocols used for the SAJTs also yielded important results. We used two different time-ceilings in our study: 4s and 6s. The former, on the one hand, generated relevant information on processing cost due to the high number of time-ceiling violation, but in order to obtain this data we missed some acceptability ratings. The latter, on the other hand, was more informative in terms of acceptability ratings and less informative in terms of time ceiling violations. Thus, since acceptability ratings are typically the critical data in AJTs, we maintain that the 6s time-ceiling is more appropriate for this speeded task. Also, we used different ungrammatical controls in our task. Whereas in experiment three we used sentences that were completely out of order in the ungrammatical group, in experiment four and six we utilized sentences with obvious agreement errors for the same purpose. The results indicate that the use of sentences completely out of order can increase the acceptability of other sentences. Accordingly, we contend that abnormal sentences should be avoided in the experimental corpus so that smaller difference in acceptability can be more clearly registered.

As for the MT, our data corroborate proponents' claims that this task can yield very localized processing data (FORSTER et al., 2009; WITZEL et al., 2012). The MT is

purported to generate RTs that reliably represent the processing cost for each of these parts. In this task, spillover effects are not expected because the MT forces the reader to incrementally integrate each part of the sentence before moving on to the next part. When we compared monolinguals' data in both the English and in the BP tasks, we clearly observed differences in RT's for licensed and unlicensed APs. Thus, the MT proved its capacity to generate localized RT data.

In the next section, we present the final conclusions of this Ph.D. dissertation.

6. Final considerations

The Multi-Competence theoretical construct has opened a considerable range of possibilities for empirical research that are of great relevance for the understanding of phenomena related to bilingualism in both the linguistic and the cognitive spheres. We understand our findings as important evidence about bilingual linguistic processing, representation and learnability. Our results show that bilingualism is able to exert influence over the L1 processing routines in cases of high proficiency. As argued by several authors (PAVLENKO, 2000; SOUZA, 2012; SOUZA et al, 2014), L2 influence on the L1 is a valuable topic of investigation for discovering possible intercommunication between languages in the bilingual mind. We also observed that this bilingualism effect on L1 processing does not extend to the level of metalinguistic awareness, since bilinguals do not differ considerably from monolinguals in their perception of sentences' that are licensed in the L2 but not in the L1. These results suggest that this apparent departure from L1 restrictions during online processing is supported by a momentary co-activation of L1 and L2 representations and not by fundamental changes in the L1 grammar, as suggested by Souza et al. (2016). Furthermore, the results of this study strongly suggests that bilinguals are capable of successfully acquiring L2-specific structures in high levels of proficiency, but learning the restrictions present in these constructions is a daunting task.

The comparison of results obtained using different protocols of data collection are crucial to the cumulative advancement of knowledge through scientific research. As discussed by Oliveira & Souza (2012), studies on the acquisition of resultative construction needed to be complemented with information on its processing. Previous studies were conducted only with non-speeded AJT, which might have allowed the

participants to make use of different sorts of knowledge to judge the sentences. Thus, the MT and the SAJT brought complementary information to the existing findings on the processing, representation and learnability of the resultative construction.

Previous studies (OLIVEIRA; SOUZA, 2012; OLIVEIRA, 2013; OLIVEIRA, 2014; OLIVEIRA, 2015; SOUZA et al, 2014) had shown that (i) highly proficient BP-English bilinguals gave high acceptability ratings to the resultative construction in English; (ii) low proficient BP-English bilinguals gave low acceptability ratings for the resultative construction in English; (iii) BP-English bilinguals gave low acceptability ratings for the resultative construction in BP; (iv) BP-English bilinguals were not as sensitive as English monolinguals in regards to the resultative predicate restrictions.

The results of our study complement these findings, demonstrating that the imposition of a time limit for issuing the acceptability judgments does not change the acceptability of the resultative construction in BP or in English. In fact, the time ceiling mitigated some of the previously observed differences between bilinguals and monolinguals in both the L1 and the L2. Also, we observed that even though bilinguals were more accepting of ungrammatical resultative sentences, they do not have a different processing cost in comparison to English monolinguals. In addition, notwithstanding the similarities in AJTs, bilinguals differ significantly from BP monolinguals as to the processing cost for the resultative predicate in the L1.

Despite the importance of these results to our understanding of the representation and processing of the resultative construction, there are still questions that need to be answered. Our study was limited to the investigation of bilinguals who have reached level 5 of the VLT test, which makes it impossible to analyze in which proficiency levels the L2 begin to influence the L1 processing. Furthermore, all the tasks were conducted while using only one language (either English or BP) to encourage

participants to be in a monolingual mode. It is possible that cross linguistic influence will be more evident when the tasks are carried out in a context encouraging the use of both languages.

Another bilingual profile that should be investigated is that of the bilingual who has undergone dominance inversion., as it might show the role that dominance has in processing, representation and learnability of L2-specific constructions. In addition, the behavior of speakers of other languages across the resultative construction can potentially contribute to our research demonstrating the role that linguistic typology has the functioning of the bilingual mind. In summary, the influence of proficiency, language dominance, language mode and linguistic typology on the processing, representation and learnability of the resultative construction are still open questions.

Finally, we cannot yet assert that the changes perceived in L1 processing of highly proficient bilinguals provide evidence of access to L2 representation and parsing strategies. It is possible that such effect occurs with bilinguals whose L2 also does not license the resultative construction and, hence, we can only affirm that we have observed an effect of bilingualism on speakers' behavior in the L1. Whether such an effect is directly related to a shared language representation is still a question open to empirical testing and it is the goal of our future research.

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Appendixes

Appendix A – Vocabulary Levels Test

VLT

01

1. original
2. private
3. royal
4. slow
5. sorry
6. total

- complete
 first
 not public

1. blame
2. hide
3. hit
4. invite
5. pour
6. spoil

- keep away from sight
 have a bad effect on something
 ask

1. basket
2. crop
3. flesh
4. salary
5. temperature
6. thread

- money paid regularly for doing a job
 heat
 meat

1. apply
2. elect
3. jump
4. manufacture
5. melt
6. threaten

- choose by voting
 become like water
 make

1. accident
2. choice
3. debt
4. fortune
5. pride
6. roar

- having a high opinion of yourself
 something you must pay
 loud, deep sound

1. birth
2. dust
3. operation
4. row
5. sport
6. victory

- being born
 game
 winning

02

1. administration
2. angel
3. front
4. herd
5. mate
6. pond

- managing business and affairs
 spirit who serves God
 group of animals

1. coach
2. darling
3. echo
4. interior
5. opera
6. slice

- a thin, flat piece cut from something
 person who is loved very much
 sound reflected back to you

1. discharge
2. encounter
3. illustrate
4. knit
5. prevail
6. toss

- use pictures or examples to show the meaning
 meet
 throw up into the air

1. bench
2. charity
3. fort
4. jar
5. mirror
6. province

- part of a country
 help to the poor
 long seat

1. marble
2. palm
3. ridge
4. scheme
5. statue
6. thrill

- inner surface of your hand
 excited feeling
 plan

1. annual
2. blank
3. brilliant
4. concealed
5. definite
6. savage

- happening once a year
 certain
 wild

03

1. alcohol
2. apron
3. lure
4. mess
5. phase
6. plank

- cloth worn in front to protect your clothes
- stage of development
- state of untidiness or dirtiness

1. apparatus
2. compliment
3. revenue
4. scrap
5. tile
6. ward

- set of instruments or machinery
- money received by the government
- expression of admiration

1. blend
2. devise
3. embroider
4. hug
5. imply
6. paste

- hold tightly in your arms
- plan or invent
- mix

1. circus
2. jungle
3. nomination
4. sermon
5. stool
6. trumpet

- speech given by a priest in a church
- seat without a back or arms
- musical instrument

1. bruise
2. exile
3. ledge
4. mortgage
5. shovel
6. switch

- agreement using property as security for a debt
- narrow shelf
- dark place on your body caused by hitting

1. desolate
2. fragrant
3. gloomy
4. profound
5. radical
6. wholesome

- good for your health
- sweet-smelling
- dark or sad

04

1. affluence
2. axis
3. episode
4. innovation
5. precision
6. tissue

- introduction of a new thing
- one event in a series
- wealth

1. configuration
2. discourse
3. hypothesis
4. intersection
5. partisan
6. propensity

- shape
- speech
- theory

1. elementary
2. negative
3. static
4. random
5. reluctant
6. ultimate

- of the beginning stage
- not moving or changing
- final, furthest

1. deficiency
2. magnitude
3. oscillation
4. prestige
5. sanction
6. specification

- swinging from side to side
- respect
- lack

1. anonymous
2. indigenous
3. maternal
4. minimum
5. nutrient
6. modification

- without the writer's name
- least possible amount
- native

1. coincide
2. coordinate
3. expel
4. frustrate
5. supplement
6. transfer

- prevent people from doing something they want to do
- add to
- send out by force

05

1. acquiesce
2. contaminate
3. crease
4. dabble
5. rape
6. squint

- work at something without serious intentions
- accept without protest
- make a fold on cloth or paper

1. auxiliary
2. candid
3. dubious
4. morose
5. pompous
6. temporal

- full of self importance
- helping, adding support
- bad-tempered

1. dregs
2. flurry
3. hostage
4. jumble
5. saliva
6. truce

- worst and most useless parts of anything
- natural liquid present in the mouth
- confused mixture

1. blaspheme
2. endorse
3. nurture
4. overhaul
5. skid
6. straggle

- give care and food to
- speak badly about God
- slip or slide

1. anterior
2. concave
3. interminable
4. puny
5. volatile
6. wicker

- small and weak
- easily changing
- endless

1. auspices
2. casualty
3. froth
4. haunch
5. revelry
6. seclusion

- being away from other people
- someone killed or injured
- noisy and happy celebration

Appendix B – Terms of Informed Consent

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Convidamos-lhe a participar de um experimento que comporá pesquisa coordenada pelo Prof. Dr. Ricardo Augusto de Souza. Essa pesquisa pertence a um estudo sobre aceitação de sentenças. Sua participação envolverá a realização de duas tarefas no computador na qual você lerá sentenças, e julgará sua aceitabilidade. No início das tarefas o experimentador fornecerá as instruções e esclarecerá dúvidas eventuais sobre a execução delas. Todos os dados coletados serão convertidos em informações numéricas e quantitativas que não serão acessadas exclusivamente pelos pesquisadores deste estudo. Assim, todos os participantes terão anonimato garantido, ou seja, sob circunstância alguma, sua identidade como participante será revelada. As tarefas, que conjuntamente têm duração aproximada de 20 minutos, exigem concentração e você poderá se sentir ligeiramente cansado. No entanto, sua participação neste estudo não envolve nenhuma forma de risco a sua saúde, nem tampouco poderá ser comprometedor de sua reputação como cidadão, como estudante, ou como profissional. Você poderá interromper sua participação do estudo em qualquer instante, sem nenhum ônus ou prejuízo. Sua participação deste estudo não acarretará benefícios imediatos para você, individualmente. Os resultados deste estudo poderão vir a público na forma de apresentações de comunicações orais ou pôster em congressos científicos; artigos científicos publicados em periódicos especializados; capítulos de livros; monografias, dissertações ou teses orientadas pelo pesquisador responsável. Contudo, pelas razões acima enumeradas as identidades dos participantes permanecerão ocultas em toda e qualquer forma de publicação e divulgação do estudo.

Caso você tenha qualquer dúvida sinta-se à vontade para fazer contato com o pesquisador responsável. Você também pode consultar o COEP (Comitê de Ética e Pesquisa da Universidade Federal de Minas Gerais) para tirar dúvidas sobre aspectos éticos da pesquisa.

Pesquisador responsável:

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[\(31\)3409-4592](tel:(31)3409-4592)

Se você aceitar participar, por favor preencha e assine o formulário de consentimento abaixo.
Agradecemos-lhe por sua participação!

FORMULÁRIO DE CONSENTIMENTO:

Eu, _____, concordo em participar da tarefa que compõe o estudo experimental sobre a linguagem no bilingüismo supervisionado pelo Prof. Dr. Ricardo A. de Souza, da Universidade Federal de Minas Gerais. Estou ciente de que minha participação do estudo não implica danos ou riscos a minha saúde e bem-estar, que ela não implica riscos à minha reputação e imagem, assim como que ela não implica benefícios imediatos para mim, individualmente. Estou também ciente de que posso interromper minha participação do experimento a qualquer momento, sem ônus algum, e de que minha identidade como participante não será exposta em nenhuma forma de divulgação dos resultados do estudo.

Data: ___/___/___

Assinatura: _____