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Crosslinguistic Influence on L3 Lexical Access: Cognate Effects in Spanish-Portuguese-English Trilinguals

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Orientadora: Prof.ª Mailce Borges Mota, Dr.ª

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Kamila Heusi Fourteau

Crosslinguistic Influence on L3 Lexical Access: Cognate Effects in Spanish-Portuguese-English Trilinguals

O presente trabalho em nível de Mestrado foi avaliado e aprovado, em dezessete de março de dois mil e vinte e seis, pela banca examinadora composta pelos seguintes membros:

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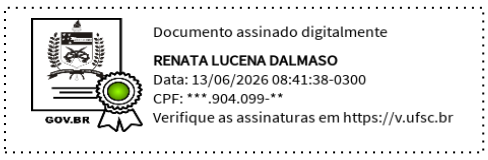

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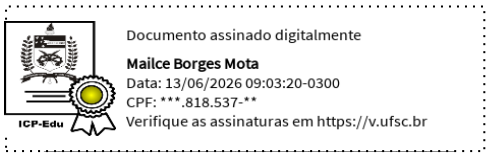

Prof.ª Mailce Borges Mota, Dr.ª
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To my family,
with gratitude.

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ABSTRACT

The structure of the mental lexicon and the processing of lexical access have been investigated in the field of psycholinguistics. Cognate facilitation effect has been argued to influence visual word recognition as word meaning precedes the orthographic and phonological forms. The discussion on crosslanguage activation expands when investigating the multilingual mental lexicon through lexical access, as multilinguals exhibit different sources and directions of crosslinguistic influence. The main objective of the present study was to investigate crosslinguistic influence in lexical access in English in native speakers of Spanish as L1, who are also speakers of Brazilian Portuguese as L2 and are learning English as L3 in school in Brazil. Specifically, this study examined whether visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3 reflects cognate effects and whether there are differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English), as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words. The sample consisted of 33 adolescents attending high school in the Brazilian public educational system. Participants were required to answer a Language Experience and Proficiency Questionnaire (the LEAP-Q) and to perform three tasks: (1) an English proficiency task, (2) a self-paced reading task, (3) a meaning recognition task. The data was analysed in R by means of multiple mixed-effects linear model to account for fixed and random effects. The results showed no significant differences across conditions. The only fixed effect for which there was a statistical significance was the length of the word measured in the number of letters. Therefore, the results can be understood within the framework of Complex Dynamic Systems Theory, which suggests that aspects such as recency, frequency, proficiency and typological proximity influence CLI and may have contributed to the absence of cognate effect in this study. The results are interpreted as interference effects may have operated through language switching, L2 immersion context and ongoing language learning. Furthermore, the results are also interpreted as individual differences, such as the environmental, linguistic and social experiences of multilingual speakers, might explain the lack of statistical significance in this study.

Keywords: multilingualism; crosslinguistic influence; lexical access; cognate effect; visual word recognition.

RESUMO

A estrutura do léxico mental e o processamento do acesso lexical têm sido investigados no campo da psicolinguística. O efeito de facilitação de cognatos é apontado como um fator que influencia o reconhecimento visual de palavras, uma vez que o significado precede a ativação das formas ortográficas e fonológicas. A discussão sobre a ativação entre as línguas se amplia ao investigar o léxico mental multilíngue por meio do acesso lexical, visto que os multilíngues apresentam diferentes fontes e direções na influência translinguística. Nesse sentido, o principal objetivo deste estudo foi investigar a influência translinguística no acesso lexical em inglês em falantes nativos de espanhol como L1, que também são falantes de português brasileiro como L2 e estão aprendendo inglês como L3, nas escolas do Brasil. Especificamente, este estudo examinou se o reconhecimento visual de palavras em falantes multilíngues de espanhol como L1, português brasileiro como L2 e inglês como L3 reflete efeitos de cognatos e se há diferenças no processamento de palavras cognatas triplas (espanhol – português brasileiro – inglês) em comparação com palavras cognatas duplas (espanhol – inglês ou português brasileiro – inglês) e palavras não cognatas. A amostra foi composta por 33 adolescentes matriculados no Ensino Médio da rede pública de ensino brasileira. Os participantes responderam um Questionário de Experiência e Proficiência Linguística (LEAP-Q) e realizaram três tarefas: (1) uma tarefa de proficiência em inglês; (2) uma tarefa de leitura automonitorada; (3) uma tarefa de reconhecimento de significado. Os dados foram analisados no R por meio de um modelo linear múltiplo de efeitos mistos, considerando efeitos fixos e aleatórios. Os resultados mostraram que não houve diferenças significativas entre as condições. O único efeito fixo com significância estatística foi o comprimento da palavra, medido em número de letras. Portanto, os resultados são compreendidos à luz da Teoria dos Sistemas Dinâmicos Complexos, que sugere que aspectos como o uso, a frequência, a proficiência e a proximidade tipológica influenciam a influência translinguística e podem ter contribuído para a ausência de efeito cognato neste estudo. Os resultados são interpretados como possíveis efeitos de interferência decorrentes da alternância de idiomas, do contexto de imersão na L2 e da aprendizagem de línguas. Além disso, os resultados são interpretados como uma explicação para as diferenças individuais, como as experiências ambientais, linguísticas e sociais dos falantes multilíngues, o que pode explicar a falta de significância nos resultados deste estudo.

Palavras-chave: multilinguismo; influência translinguística; acesso lexical; efeito cognato; reconhecimento visual de palavras.

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LIST OF ABBREVIATIONS AND ACRONYMS

BIA	Bilingual Interactive Activation
BIA+	Bilingual Interactive Activation plus model
BP1	Brazilian Portuguese as L1
BP2	Brazilian Portuguese as L2
C1	Condition 1
C2	Condition 2
C3	Condition 3
CC	Control Condition
CC1	Control Condition 1
CC2	Control Condition 2
CC3	Control Condition 3
CDST	Complex Dynamic Systems Theory
CENBP	English and Brazilian Portuguese double cognate words
CENBPSP	English, Brazilian Portuguese and Spanish triple cognate words
CENSP	English and Spanish double cognate words
CEPSH	*Comitê de Ética em Pesquisa com Seres Humanos*
CFE	Cognate Facilitation Effect
CG1	Control Group 1
CGEG	English and German double cognates
CGEP	English and Brazilian Portuguese double cognates
CGT	English, German and Brazilian Portuguese triple cognates
CI	Confidence Intervals
CLI	Crosslinguistic Influence
COCA	Corpus of Contemporary American English
COVID-19	Coronavirus Disease-2019
DMM	Dynamic Model of Multilingualism
EC	Experimental Condition
EC1	Experimental Condition 1
EC2	Experimental Condition 2
EC3	Experimental Condition 3
EG1	Experimental Group 1
EG2	Experimental Group 2

EJA	*Educação de Jovens e Adultos*
EN3	English as L3
IA	Interactive Activation model
INEP	*Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira*
L1	Native Language
L2	Second Language
L3	Third Language
LabLing	Language and Cognitive Processes Laboratory
LEAP-Q	Language Experience and Proficiency Questionnaire
MIA	Multilingual Interactive Activation model
ms	milliseconds
NCENBP	English and Brazilian Portuguese non-cognate words
NCENBPSP	English, Brazilian Portuguese and Spanish non-cognate words
NCENSP	English and Spanish non-cognate words
NEPO	*Núcleo de Estudos de População Elza Berquó*
NLD	Normalized Levenshtein Distance
OBMigra	*Observatório das Migrações Internacionais*
OSF	Open Science framework
RAE	Real Academia Española
RHM	Revised Hierarchical Model
RT	Reaction time
SC	Santa Catarina
SD	Standard Deviation
SLA	Second Language Acquisition
SP1	Spanish as L1
SP2	Spanish as L2
TALE	*Termo de Assentimento Livre e Esclarecido*
TCLE	*Termo de Consentimento Livre e Esclarecido*
TIA	Trilingual Interactive Activation model
TLA	Traditionally Third Language Acquisition
TLL	Third Language Learning
VLT	Vocabulary Levels Test
VOLP	*Vocabulário Ortográfico da Língua Portuguesa*
WEIRD	Western, Educated, Industrialized, Rich and Democratic

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1 INTRODUCTION

Over the past three decades, the structure and processing of the multilingual mental lexicon have drawn increased attention. This interest has been growing, particularly since the consolidation of the field of Third Language Learning – TLL[1] (Aronin; Hufeisen, 2009; Szabó; Jessner, 2024). Since the beginning of TLL, many studies have been conducted to investigate how multilinguals search for a word and its meaning in their lexicon (Toassi, 2016). The field of TLL explores the complexity of lexical access as multilinguals exhibit different sources and directions for crosslinguistic influence (Ecke, 2015; Szabó; Jessner, 2024).

As explained by Traxler (2012), lexical access is the retrieval of words from the mental lexicon when we hear (through spoken word processing) and see (through visual word processing). Lexical access has been investigated in both production and comprehension of multilinguals (Traxler, 2012; Mota; Rigatti; Toassi, 2023). The process of lexical access during comprehension occurs during spoken word recognition as much as during visual word recognition (Traxler, 2012; Mota; Rigatti; Toassi, 2023).

It is known that the languages of multilinguals compete for activation and selection (Traxler, 2012) since bilinguals are not two monolinguals in one person (Grosjean, 1989). According to Traxler (2012), the cognate advantage is observed when multilinguals use a cognate word in one of their languages and their languages are activated at the same time. However, it is unclear if all the languages are activated or if a specific language among their languages is activated. The process of visual word recognition involves how words activate lexical representations and processing during cognate facilitation (Van Assche; Duyck; Hartsuiker, 2012), particularly for those who are learning a new linguistic system. This study contributes to the body of research on multilingual lexical access by investigating lexical access during visual word recognition.

The present study draws heavily on Toassi's doctoral thesis (2016), which investigated lexical access processes in multilinguals, both in language comprehension and production of non-native speakers of English, who also had Brazilian Portuguese as the L1 and German as the L2. Toassi (2016) found that lexical access of multilinguals differs significantly from that of bilinguals due to the increased complexity of crosslinguistic interactions among three or

[1] The terms language acquisition and language learning can be used as synonyms in both Second Language Acquisition – SLA (Ellis, 2015) and Third Language Acquisition – TLA (Cenoz, 2013; Hammarberg, 2018). Although TLA is a cover term for both acquisition and learning, I will use Third Language Learning (TLL) interchangeably for both, as in the present study, Brazilian Portuguese is learned both implicitly and explicitly as L2, and English is learned explicitly as L3.

more languages. In addition, the results of Toassi's doctoral thesis (2016) were consistent with the non-selective view of lexical access, which states that all languages are activated in a monolingual task. Toassi (2016) also emphasised the existence of an asymmetry in the lexical organisation of trilinguals, showing that L1-L2 and L1-L3 connections are stronger than L2-L3.

Following the results and the suggestions of Toassi's doctoral thesis (2016), this study aims to investigate crosslinguistic influence (CLI) at the lexical level in native speakers of Spanish as L1, who are also speakers of Brazilian Portuguese as a second language and are learning English as a third language at schools in Brazil. This research will use cognates, as cognates allow the investigation of multilinguals' lexical structure and processing (Toassi, 2016). This study will investigate the non-target languages in the comprehension of English with a new language combination of Spanish, Brazilian Portuguese and English. Additionally, this research will contribute to a family of crosslinguistic influence studies at the lexical level conducted at the *Laboratório da Linguagem e Processos Cognitivos* – LabLing (Language and Cognitive Processes Laboratory).

Based on the literature, I will examine whether both Spanish and Brazilian Portuguese facilitate crosslinguistic influence in English as a third language or whether one language is the only source of influence (Otwinowska, 2024). This study investigates CLI at the lexical level, as the research examines the relationship between the L1 – L3 as much as the relationship between the L2 – L3 (Cenoz; Hufeisen; Jessner, 2001). Researchers have shown an increasing interest in investigating how languages influence one another in the field of TLL (Mota; Rigatti; Toassi, 2023). However, little is known about CLI in the comprehension of English, specifically in the process of word recognition, in the Brazilian context. Even though there is evidence that comprehension is influenced by the non-target language (Toassi, 2016), some questions about the multilingual lexicon in the field of TLL are still not clear, such as which language influences the acquisition of a third language – whether the L1, L2 or a combination of languages (Otwinowska, 2024).

The greatest motivation for me to carry out the present study is related to my experience as a public school teacher of English. In my professional practice, I have observed an increase in international migration to Brazil from 2019 to 2021. The rise of international migration occurred all over Brazil, including the South region, where the Grande Florianópolis region is located (Cavalcanti; Oliveira; Silva, 2022). According to the *Observatório das Migrações Internacionais* – OBMigra (Cavalcanti; Oliveira; Silva, 2022), international migration has increased with a significant number of women, teenagers, and children in the last decade in

Brazil. The OBMigra highlights that the rise in international migration was driven by the COVID-19 pandemic. The report also draws attention to the increasing number of women in the migrant movement and the insertion of women in the labour market (Cavalcanti; Oliveira; Silva, 2022). As stated in the OBMigra's report (Cavalcanti; Oliveira; Silva, 2022), most of the children and teenagers who migrated to Brazil from 2019 to 2021 are from Venezuela, Bolivia, and Haiti. The report also emphasises that there was a high significant number of refugee children who were from Venezuela, Cuba, Haiti and Angola. Venezuela, Bolivia and Cuba have Spanish as their official language[2].

The rise of international migration has occurred all over Brazil and its effects are seen in many different contexts in society, especially at schools[3]. The report from OBMigra (Cavalcanti; Oliveira; Silva, 2022) also demonstrates that from the three education segments - early learning, elementary school I and II[4] and high school - elementary school I and II presented an exponential growth of international migrant students. In Santa Catarina (SC), a large increase was observed in 2020, with 5906[5] international migrant students attending elementary school and 1395 international migrant students attending high school in the public educational system. According to the OBMigra (Cavalcanti; Oliveira; Silva, 2022), the Grande Florianópolis region[6] received 1242 international migrant students attending elementary school and 359 international migrant students attending high school in the public educational system in 2020.

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[2] BATCHGEO. **Countries speaking languages**. Available at: https://batchgeo.com/map/batchgeo-languages Accessed on: 10 Oct. 2025.

[3] In Brazil, Education is a Constitutional right, and attendance is mandatory for children and teenagers from 4 to 17 years old (Brasil, 1996; 1988).

[4] Middle and elementary II schools are named as synonyms in the educational system in Brazil and correspond from 6th to 9th year (De Oliveira; Santos; Capellini, 2024).

[5] To obtain this data from OBMigra, I emailed OBMigra at FOURTEAU, Kamila H. **Número de crianças imigrantes que frequentam as escolas públicas em SC.** Recipient: Observatório das Migrações Internacionais. [S.I.], 18 Oct. 2024. 15 electronic messages. The OBMigra's statistics coordination shared with me a file containing the distribution of students by education segment, municipality and school for the year 2020, based on the INEP school census in this period. As reported in the email, the data is outdated because INEP's public data regarding international migrant students ceased to be shared since 2020, which increases the limitation of statistical data regarding the school insertion of international migrant students in the public education system (Cavalcanti; Oliveira; Silva, 2022). The last publication regarding the school insertion of international migrant students in the public education system is from 2020 (Cavalcanti; Oliveira; Silva, 2024). Therefore, in this study, I used the 2022 report as a reference because the released data provide statistical information on the school insertion of international migrant students into the public education system through 2020.

[6] The Grande Florianópolis region is located in SC. The cities from the Grande Florianópolis region are Águas Mornas, Alfredo Wagner, Angelina, Anitápolis, Antônio Carlos, Biguaçu, Canelinha, Florianópolis, Garopaba, Governador Celso Ramos, Leoberto Leal, Major Gercino, Nova Trento, Palhoça, Paulo Lopes, Rancho Queimado, Santo Amaro da Imperatriz, São Bonifácio, São João Batista, São José, São Pedro de Alcântara, Tijucas.

Currently, it is known from the *Observatório das Migrações em São Paulo*[7] website that from 2022 to 2024[8], SC had 18.564 international migrant children and teenagers (from 0 to 15 years old) registered in the state, and 14.766 international migrant people who reported being students in this period. More specifically, from 2022 to 2024[9] the Grande Florianópolis region had 2.696 international migrant children and teenagers (from 0 to 15 years old) registered in the state, and 2.166 international migrant people who reported being students in this period. However, it is not officially published by the *Observatório das Migrações em São Paulo* website how many international migrant students have enrolled at public schools in this period.

International migration is a social issue and is steering multilingualism. (Gogolin, 2021). The context introduced above indicates that Spanish native speakers (L1), who are also speakers of Brazilian Portuguese (L2), are learning English (L3), since in Brazil English classes are mandatory as a school subject from the 6th grade on (Brasil, 1996, 2017). In this scenario, bi-multilingualism is a new challenge for public education (Gogolin, 2021), as Brazilian Portuguese, the official language in the school context, is giving place to linguistic diversity. Thus, this scenario guides us to ask how these students' languages interact in their linguistic system. One way to approach this question is by investigating how native speakers of Spanish, immersed in Brazilian Portuguese as a second language, process English as a third language in tasks such as word recognition in English.

Therefore, the main objective of the present study is to investigate CLI in lexical access in English by native speakers of Spanish as a first language, who are also speakers of Brazilian Portuguese as a second language and are learning English as a third language at school in Brazil. The specific objectives of the present study are: (i) to examine if visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3 reflect cognate effects; (ii) to investigate if there are differences in the processing of triple cognate words (Spanish, Brazilian Portuguese, English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word

[7] The *Observatório das Migrações em São Paulo* is a research group developed by the Núcleo de Estudos de População Elza Berquó (NEPO). The NEPO investigates migration processes in Brazil, both national and international. The data is available on the research group website UNIVERSIDADE ESTADUAL DE CAMPINAS - NÚCLEO DE ESTUDOS DE POPULAÇÃO "ELZA BERQUÓ". **Observatório das Migrações em São Paulo**. Campinas, 2024. Available at: https://www.nepo.unicamp.br/observatorio/bancointerativo/numeros-imigracao-internacional/sincre-sismigra/. Accessed on: 30 Oct. 2025.

[8] I used the filter SC from 2022 to 2024 to have this data on the *Observatório das Migrações em São Paulo* website. The data for 2024 was updated on 31st of January of 2025.

[9] I used the filter in each city of the Grande Florianópolis region in SC from 2022 to 2024 to have this data on the *Observatório das Migrações em São Paulo* website. The data for 2024 was most recently updated on 31st of January of 2025.

recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3.

Following the main and specific objectives, the research questions that will guide the present study will be the following:

RQ1: How does visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2, and English as L3 reflect cognate effects?

RQ2: Are there differences in the processing of triple cognate words (Spanish, Brazilian Portuguese, English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3?

1.1 SIGNIFICANCE OF THE RESEARCH

This research has scientific and social relevance. The scientific significance consists in contributing to a better understanding of how the multilingual lexicon is organised and accessed. Even though there were some studies conducted about the multilingual lexicon, there is still no agreement on whether lexical storage is shared or divided and whether lexical access is selective or non-selective. Additionally, the present study will improve our knowledge of how languages influence one another during comprehension. Finally, this study will also help to clarify whether the learning of a third language influences the second language in an immersion environment.

The social relevance of the study consists of including immigrants as participants, especially because these are young language learners and users attending high school in the public educational system. In addition, selecting this non-WEIRD[10] population and integrating the native language of immigrants in the design makes the present study more diverse and inclusive. Beyond its scientific and social relevance, this research can contribute to English pedagogical practices to gain an understanding of how cognate words help students to process English faster.

1.2 ORGANISATION OF THE MASTER DISSERTATION

[10] WEIRD means Western, Educated, Industrialized, Rich and Democratic (Leivada *et al*., 2023).

This master's dissertation is divided into five chapters. Following the introduction, Chapter 2 will review the literature to define bilingualism and multilingualism, to discuss CLI in the field of TLL, to explain the models The Dynamic Model of Multilingualism and the Complex Dynamic Systems Theory, to discuss visual word recognition and the cognate facilitation effect (CFE), to define the mental lexicon, to discuss the organisation and selectivity of the bilingual and the multilingual mental lexicon and to present empirical studies conducted at LabLing regarding CLI at the lexical level. Chapter 3 will present the main methodological procedures of this study, including the research questions, hypotheses and rationale, the research design, the participants, the instruments required for data collection, the ethical procedures, the open science practices, the pre-pilot and the pilot study, and the procedures for data collection. Chapter 4 will describe the data organisation, present the descriptive and inferential analyses, the general discussion, and readdress the research questions and hypotheses. Chapter 5 will present the conclusion and final remarks, including limitations of this study, suggestions for future research, and pedagogical implications.

2 REVIEW OF LITERATURE

The present review of literature is divided into five sections. Section 2.1 will define bilingualism and multilingualism and will draw attention to the main streams concerned with bi-multilingualism. Section 2.2 will discuss CLI in the field of TLL, followed by the Dynamic Model of Multilingualism and the Complex Dynamic Systems Theory (CDST) in subsection 2.2.1. Section 2.3 will discuss visual word recognition and the cognate facilitation effect (CFE). Section 2.4 will present the multilingual mental lexicon, followed by models of lexical access in subsection 2.4.1. Finally, section 2.5 will introduce empirical studies conducted at LabLing regarding CLI at the lexical level.

2.1 DEFINING BILINGUALISM AND MULTILINGUALISM

Exploring a definition for the words "bilingual" and "bilingualism", Grosjean (2022) observed that dictionaries emphasise more language use than language fluency, but dictionary definitions still reflect the lay person's view of what "bilingual" and "bilingualism" mean: the monolingual view of bilingualism- the bilingual should be two monolinguals in one person. Since the definition of the monolingual view has been discussed, Grosjean[11] (1989, 2008) has debated the negative consequences of the monolingual biases and has proposed a holistic view of bilingualism 40 years ago.

The debate about languages dates back to ancient Rome (Harris; Taylor, 1997) and contributed to the standardisation of the monolingual perspective. This debate was influenced by the nation-state ideology proposed by Johann Gottfried Herder in the Age of Enlightenment, leading European nation-states to "[…] use monolingualism as a tool to trigger and reinforce a sense of unity" (Leivada *et al*., 2023, p.5). Bloomfield (1933) contributed to the monolingual perspective, as he was the first to define bilingualism as the native-like control of two languages. The native-like control is associated with a discriminatory attitude toward people and language, as monolingualism is seen as the norm and bilinguals are often compared to the ideal native speaker (De Houwer, 2023). As argued by Jansen *et al.* (2021), published studies from the 1900s to the 1960s suggested consequences of bilingualism for cognitive development and intelligence, implying that bilinguals were inferior to monolinguals. Subsequently, from

[11] "The bilingual as a competent but specific speaker-hearer" was published in 1985 and "Neurolinguists, beware! The bilingual is not two monolinguals in one person" in response to the publication "Life with Two Languages: An Introduction to Bilingualism (Harvard University Press)" (Grosjean, 2008, p.8).

the 1970s to the 2000s, there was an emergence of the bilingual advantage hypothesis since the publication of Peal and Lambert's article (1962), which favoured a bilingual advantage. From 1997 to 2007, there was a preference for a cognitive approach in Second Language Acquisition – SLA (Zhang, 2019).

Since the view of communicative competence is seen as knowledge, and the ability for use is surrounded by cognitive and non-cognitive elements (Hymes, 1972; Canale; Swain, 1980; Canale, 1983; Bachman, 1990), Grosjean (2022, p.22) has described "[…] bilinguals as those who use two or more languages (or dialects) in their everyday lives". Similarly, De Bot (2019, p.4) defines bi/multilingualism as "[…] the daily use of two or more languages". Grosjean (2008) was one of the earliest to discuss the concept of language use in the individual's life experience, even before the social turn in SLA emerged in the early 2000s, stimulated by Firth and Wagner's debate (1997). As shown here, the definition of bilingualism proposed by Grosjean is less conservative, as learners can also be considered bilinguals (Limberger; Mota; Buchweitz, 2020).

From the year 2005, the bilingual turn in SLA occurred via the Complex Dynamic System Theory – CDST (Zhang, 2019; Cook, 2016). The bilingual multicompetence proposed by Vivian Cook (2016) embraced knowledge and use of two or more languages. Cook (2016) followed the concept of language use by Grosjean (1989) and added the term knowledge of two or more languages in the concept of bilingualism.

Although some researchers assumed bilinguals and multilinguals are the same, others discussed the importance of making a clear distinction between them (Hoffmann, 2001; Jessner, 2006; De Angelis, 2007; Kemp, 2009; Bathia; Ritchie, 2013). This recommendation aims to avoid a bilingual bias, which occurs when bilinguals and monolinguals have the same psycholinguistic mechanisms and processing strategies (De Angelis, 2007; Butler, 2013).

Even though the boundaries between bilinguals and multilinguals are not clear to some researchers, Butler (2013) highlights multilingual differences, including prior experience with languages, greater cognitive flexibility, greater metalinguistic awareness, and other strategies, all of which are characteristics of multilinguals. These characteristics contribute to the idea that multilinguals are different from bilinguals and dispose bilinguals as users of two languages and multilinguals as users of three or more languages or who know three or more languages (Hammarberg, 2001; Ecke, 2015). Considering the literature, in this study, the term bilingual will be used to refer to users or who know two languages and the term multilingual will be used to refer to users or who know three or more languages. In the next section, I will discuss CLI in the field of TLL.

2.2 CROSSLINGUISTIC INFLUENCE IN THIRD LANGUAGE LEARNING

CLI, also known as transfer[12], was initially proposed in second language acquisition (SLA) to examine how the two systems, L1 and L2, could influence one another. There seems to be consensus in the field of SLA that any process of acquisition/learning after the first language would follow the same process as in the second language (Jessner, 2006; Doughty; Long, 2010; Ellis, 2015). The multilingual turn changed the course of SLA regarding bilingualism in terms of monolingual competence. The concept of multi-competence proposed by Cook (2016) includes not only the native language, but all languages that belong to the linguistic system. In addition, multi-competence is not influenced by the monolingual native speaker and all languages are interconnected with the cognitive system, rather than connected only to the native language (Cook, 2016).

From the early 1900s (Aronin; Hufeisen, 2009), the field of TLL has arisen. From the 2000s, the field of TLL became widely recognised through the establishment of the International Association of Multilingualism and the International Journal of Multilingualism (Aronin; Hufeisen, 2009). Prior to this, the process of learning a third language was seen as similar to that of learning a second language. The non-native language influence on multilingual lexicon began to be examined from different perspectives in the field of TLL, changing the course of how CLI was being interpreted (Cenoz; Hufeisen; Jessner, 2001; De Angelis; Dewaele, 2009). The field of TLL changed research on the multilingual mental lexicon, as the interaction between L1 and L3 began to be investigated as much as the interaction between L2 and L3 (Jessner, 2006). Even though some scholars (e.g., Aronin; Hufeisen, 2009; Rothman; Iverson; Judy, 2011; Cenoz, 2013; Vetter; Jessner, 2019; D'angelo, 2023) conduct research regarding TLL and assume TLL as a field on its own, other scholars (e.g., Leung, 2007; Ellis, 2015) still consider TLL as a field under SLA (Aronin; Hufeisen, 2009).

Since the establishment of the TLL, various studies have been conducted and have demonstrated different outcomes in multilingual language processing research. Whilst some studies have shown that bilinguals process words faster than trilinguals (e.g. Forcelini; Sunderman, 2020; Lameira *et al.*, 2023), other studies have shown that multilinguals process faster than bilinguals. These studies demonstrate whether L3 acquisition is related to the learning experience in the L1 (e.g., Bogulski; Bice; Kroll, 2019; Hirosh; Degani, 2021), to the

[12] Traditionally, CLI and transfer are often used interchangeably in SLA and involve retention (Odlin, 2010). However, I adopted a broader view of CLI (Kellerman; Smith, 1986) in this study, in which transfer is one of the phenomena of CLI (Jessner, 2006; Kellerman; Smith, 1986).

learning experience in the L2 (e.g., Carvalho; Mota; Rigatti, 2022; Stoehr *et al*., 2023) or the combined previous languages (e.g., Westergaard *et al*., 2017; Smidfelt, 2018; Mulík; Carrasco-Ortiz; Amengual, 2019; Toassi; Mota; Teixeira, 2020; Germanovna; Viktoroyna; Vladimirovna, 2021; Toassi *et al*., 2023).

Research on CLI has investigated the influence of a person's knowledge or use of one language on another language (Jarvis; Pavlenko, 2010). However, the extent and nature of the language interaction remain unclear (Toassi; Mota, 2021). Aiming to clarify the reasons of CLI, many scholars agreed that linguistic factors may influence CLI, such as (1) proficiency in the target and source language, which is exposed through levels of competence; (2) recency, easily activation because of recent use; (3) frequency, amount of use of the language; (4) order of acquisition, the sequence in which languages were acquired; (5) psychotypological similarity, perceived words based on phonological and/or orthographical similarity activation; (6) language distance, which is relatedness to the origin of the languages; (7) L2 status, the tendency to activate the second rather the third language in performance; and (8) age of onset, as an influencing factor in L3 learning (Hammarberg, 2001; Carvalho; Silva, 2006; De Angelis, 2007; Treffers-Daller, 2019; Toassi; Mota, 2021; Englert; Venagli; Kupisch, 2025; Dang; Macis; Munizaga, 2025). Besides these factors, the exposure to a non-native language environment, the degree of formality of the context of language use, the amount of experience with the L3 and the level of metalinguistic awareness have been suggested as predictors of CLI (De Angelis, 2007; Laoire; Singleton, 2009; Najjar, 2020).

The order of the languages is a strong predictor in TLL (Bardel; Falk, 2007; Bardel; Falk, 2012), as the previous linguistic system alters the process of learning and acquiring the target language (Rothman; Iverson; Judy, 2011). The order of a third language requires that a third language is learned following the first and second language or following the early pair of languages (Cenoz, 2013). According to Cenoz (2000), the acquisition orders could arise from: (1) the three languages being acquired simultaneously; (2) the three languages being learned consecutively; (3) two languages being learned simultaneously after the acquisition of the L1; (4) two languages being acquired simultaneously before learning the L3.

In the present study, the hypothesis of the order of learning the languages is the most important factor (Williams; Hammarberg, 1998; Hammarberg, 2001; Bardel; Falk, 2007, 2012; Falk; Bardel, 2010, 2011; Bardel; Sánchez, 2017), as the main objective is to investigate CLI in English in native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3). Even though there is a contextual factor from the perspective of SLA, this study considers the hypothesis of the order of learning languages from the

perspective of TLL (Williams; Hammarberg, 1998; Hammarberg, 2001; Bardel; Falk, 2007, 2012; Falk; Bardel, 2010, 2011; Bardel; Sánchez, 2017). The contextual factor from the perspective of SLA is regarding the development of Brazilian Portuguese as a function use and as a social role in the community. Additionally, English is interpreted as a foreign language, a language learnt and typically used in classrooms through instruction (Ellis, R., 1994; Ellis, 2015). However, the hypothesis of the order of learning languages from TLL becomes the fundamental criterion to investigate how the previous linguistic system changes the process of learning English (Williams; Hammarberg, 1998; Hammarberg, 2001; Bardel; Falk, 2007, 2012; Falk; Bardel, 2010, 2011; Bardel; Sánchez, 2017). Therefore, to pursue this hypothesis, English will be viewed as a third language learned subsequently after the second, Brazilian Portuguese, which is subsequently learned after the first or native Spanish language (Gass; Selinker, 2008). In the next subsection, I will discuss two crosslinguistic models in TLL.

2.2.1 The Dynamic Model of Multilingualism and the Complex Dynamic Systems Theory

Since the establishment of multilingual systems as a dynamic and interconnected process in language development (Ahn, 2024), there has been an increasing interest in developing crosslinguistic models to determine CLI in TLL. The Dynamic Model of Multilingualism (DMM), designed by Herdina and Jessner (2002), was a pioneering model that proposed multilingual processing as dynamic (Szabó; Jessner, 2024). More recently, the DMM was updated to the Complex Dynamic Systems Theory – CDST (Jessner, 2023). I will discuss the DMM and the CDST in this subsection.

The DMM provided an opportunity to advance our knowledge about the multilingual development systems, as the systems are seen as dynamic, which changes through the input from the environment and through the interaction between the systems and subsystems (Herdina; Jessner, 2002; Jessner, 2023). This process of learning, also known as dynamic homeostasis, shows that the environment and internal conditions influence multilinguals' language interactions (Herdina; Jessner, 2002). In addition, the DMM does not acknowledge the monolingual view of bilingualism and recognises a holistic view of bilingualism, following the concept of multi-competence described in the ideas of Grosjean and Cook (Jessner, 2006; Toassi; Mota, 2015; Szabó; Jessner, 2024).

Some characteristics are defended by the DMM, for instance, language learning is claimed to be a non-linear process, which means any language can influence the process of

learning a new language (Herdina; Jessner, 2002; Jessner, 2023; Szabó; Jessner, 2024). Another characteristic presented by the DMM is that language maintenance and language loss depend on language use, arguing that knowledge can be lost or learned through our experiences over time (Herdina; Jessner, 2002; Jessner, 2023). Another significant characteristic is that language systems are separated, but not autonomous systems (Herdina; Jessner, 2002; Jessner, 2023). Language systems are described as interdependent, which means that previous and subsequent systems influence the process of learning a new language (Herdina; Jessner, 2002; Toassi; Mota, 2015; Jessner, 2023). Also, the complexity and variability of the system allow the influence of subject factors, and the influence of other languages already learned (Herdina; Jessner, 2002). The DMM considers that all languages present a degree of complexity (Herdina; Jessner, 2002). However, proficiency and typology can impact CLI (Herdina; Jessner, 2002).

The update of the DMM based on the CDST predicts a description of an organisation and patterns of complex systems (Jessner, 2023). Language acquisition is interpreted as language development, as the process of learning for multilinguals is argued to be dynamic and complex (Jessner, 2023). Proficiency remains an important factor in CDST to point out how much crosslinguistic interaction and linguistic and cognitive effects influence lexical access (Jessner, 2023). A holistic approach is proposed and linked to cognitive and social aspects of multilinguals, as social interactions influence cognitive processes (Jessner, 2023). Metalinguistic awareness continues to be an important factor in focusing on form and meaning (Jessner, 2023). Metalinguistic awareness in multilinguals is argued to embed both metalinguistic and crosslinguistic awareness during the use of the language (Jessner, 2023; Szabó; Jessner, 2024). Therefore, metalinguistic awareness is supported in a holistic perspective in which previous and subsequent systems are included in the multilingual system (Jessner, 2023).

2.3 VISUAL WORD RECOGNITION AND THE COGNATE FACILITATION EFFECT

Researchers have investigated the mental lexicon to understand how it is structured and accessed (Lemhöfer, 2023). Since Levelt's speaking model (1989), form and meaning have been proposed to influence the mental lexicon during visual word recognition (De Bot, 1992; Szubko-Sitarek, 2015). Word meaning has been argued to precede form activation and phonological encoding in lexical items (De Bot, 1992). Some factors have been argued to influence visual word recognition, such as the CFE (Szubko-Sitarek, 2015; Sanahuja; De

Diego-Balaguer; Erdocia, 2025). In this section, I will discuss the definition of cognates and the CFE.

The main aspect to define cognates in psycholinguistics is crosslanguage similarity in the two or more languages (Tokowicz, 2015), as psycholinguistics focuses on language processing rather than linguistic history (Szubko-Sitarek, 2015; Dang; Macis; Munizaga, 2025). The focus on language processing overcomes the etymological origins of words (Szubko-Sitarek, 2015). Spanish, Brazilian Portuguese and English belong to the same Indo-European family of languages (Clackson, 2007; Wallace, 2017). More specifically, Brazilian Portuguese and Spanish are Romance languages and English is a Germanic language (Clackson, 2007; Wallace, 2017). The branches Romance and Germanic languages belong to the same Indo-European family of languages (Clackson, 2007; Wallace, 2017). Although the origins of Spanish, Brazilian Portuguese and English belong to the same Indo-European family of languages, the crosslanguage similarity across these languages will overcome the etymological word origin influence of cognates (Clackson, 2007; Wallace, 2017; Szubko-Sitarek, 2015; Dang; Macis; Munizaga, 2025). This occurs due to structural language processing having greater significance than having a common ancestor among the languages in psycholinguistics (Carroll, 1992; Szubko-Sitarek, 2015; Dang; Macis; Munizaga, 2025).

Cognate words can be defined as words with similar meaning and similar orthographic and/or phonological form that overlap and facilitate language processing (Szubko-Sitarek, 2015; Tokowicz, 2015; Cop *et al*., 2017; Paolieri; Morales; Bajo, 2018; Sanahuja; De Diego-Balaguer; Erdocia, 2025; Roembke; Koch; Philipp, 2024; Dang; Macis; Munizaga, 2025). Cognate words are used to investigate the multilingual mental lexicon, as they are recognised faster than non-cognate words (Szubko-Sitarek, 2015; Nation, 2022; Lemhöfer, 2023; Dang; Macis; Munizaga, 2025). Some factors influence cognate word recognition, for instance word frequency (Szubko-Sitarek, 2015; Peters, 2020; Dang, Webb; Coxhead, 2022; Urdaniz; Skoufaki, 2022; Dang; Macis; Munizaga, 2025) and the orthographic and phonological transparency of cognates (Szubko-Sitarek, 2015; Dang; Macis; Munizaga, 2025). Regarding the degree of similarity, cognate words are classified as identical or non-identical words (Szubko-Sitarek, 2015). Identical cognate words share complete orthographic similarity, and non-identical cognate words share similar orthography, but do not share the complete orthographic form (Szubko-Sitarek, 2015). Regarding the word frequency, high-frequency cognate words are argued to influence more CFE compared to low-frequency cognate words (Szubko-Sitarek, 2015; Peters, 2020; Dang, Webb; Coxhead, 2022; Urdaniz; Skoufaki, 2022; Dang; Macis; Munizaga, 2025).

Szubko-Sitarek (2015) points out that researchers have been discussing the extent of the facilitatory cognate effect in language learning. According to the results of Lotto and De Groot's research (1998, p.32), "… cognates and high-frequency words were easier to learn than noncognates and low-frequency words…". Another significant study on language learning is that of De Groot and Keijzer (2000). De Groot and Keijzer (2000) investigated word concreteness, cognate status and word frequency and their results showed that cognate and concrete words were easier to learn and remember. In this way, cognate words link to a shared representation, instead of adding new entries in memory as in non-cognate words (Szubko-Sitarek, 2015). This process is known as the cognate advantage or CFE.

The CFE in lexical processing is interpreted when cognates have a positive CLI (Kellerman; Smith, 1986; Agustín-Llach, 2019). Form and meaning in both identical and non-identical words facilitate word representation and retrieval (Szubko-Sitarek, 2015). On the other hand, the interference effect is a negative result (Kellerman; Smith, 1986) of co-activation during CLI when there is a cost to lexical access (Agustín-Llach, 2019; Bailey; Lockary; Higby, 2024). The interference effect occurs when languages are activated in parallel and compete for activation, causing a slower response (Caramazza; Brones, 1979; Costa; Miozzo; Caramazza, 1999; Costa; Caramazza, 1999). Additionally, interference arises just under certain contexts, for instance, in the "[…] context of language switching and language learning, as well as second-language immersion settings" (Bailey; Lockary; Higby, 2024, p.496). Various empirical studies (e.g., Blank; Llama, 2019; Bogulski; Bice; Kroll, 2019; Miller; Rothman, 2020; Beatty-Martínez *et al*., 2020; Botezatu *et al*., 2022) have mentioned that exposure to a non-native language environment could intensify competition between lexical items and delay performance in the native language. Conversely, some studies have shown that the influence of a language is independent of the learning environment (e.g., Stoehr *et al*., 2023), as well as immersion in the native language does not cause interference (e.g., Toassi; Mota; Teixeira, 2020; Carvalho; Mota; Rigatti, 2022).

Costa and Caramazza (1999) reported no evidence of competition between the lexicons during lexical access. Since then, the CFE has acknowledged that words are stored in an integrated multilingual lexicon and that lexical access is nonselective (Szubko-Sitarek, 2015; Lemhöfer, 2023). Therefore, CFE is a significant process as much as interference effect in visual word recognition to comprehend the structure and processing of the multilingual mental lexicon. This study guides us to ask whether the process of visual word recognition in English exhibits CFE or interference effects among Spanish, Brazilian Portuguese and English cognate words. In the present study, Spanish native speakers (L1) are immersed in the Brazilian

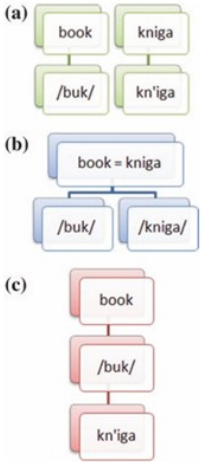
Portuguese language environment, who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) as a school subject. To better comprehend the multilingual mental lexicon, I will define the mental lexicon and discuss the organisation and selectivity of the bilingual and the multilingual mental lexicon in the next section.

2.4 THE MULTILINGUAL MENTAL LEXICON

Investigating crosslinguistic influence at the lexical level, introduces the mental lexicon construct as the main topic of discussion. The first concept of the mental lexicon was defined in psycholinguistics as a mental dictionary by Treisman in 1961 (Coltheart *et al.*, 2001). A few years later, Oldfield used the mental lexicon construct in 1966 (Szubko-Sitarek, 2015). Aitchinson (1987) also described the mental lexicon as a mental dictionary and as a flexible word-store. The flexibility concerns the changes in our mental dictionary when new words are added, and pronunciation and meaning are varied or altered (Aitchinson, 1987). Szubko-Sitarek (2015) defined the mental lexicon as those having lexical entries, which are the information on individual words regarding semantics, morphosyntax and morphophonology (Fernández; Cairns, 2011).

The first definition of the bilingual lexicon was proposed in 1953 by Weinreich. Weinreich (1953) was the first to mention a common or independent bilingual lexicon (Szubko-Sitarek, 2015). Grounded on Saussurian's concepts concerning the signifier (concept) and the signified (expression of a word), Weinreich (1953) proposed that word meaning and word expression influence the bilingual lexicon (De Angelis, 2007). The author of the book Languages in Contact (Weinreich, 1953) presented three classifications of the bilingual mental lexicon representations: coordinate, compound and subordinative. Coordinate bilingualism is represented in two separate conceptual representations, one representation for each language and without linked connections (Tokowicz, 2015; Szubko-Sitarek, 2015). In compound bilingualism, words between the languages would present a shared representation (Tokowicz, 2015; Szubko-Sitarek, 2015). In subordinative bilingualism, the new language is learned through the already known language (Tokowicz, 2015). The classification of the bilingual mental lexicon representations is shown in Figure 1:

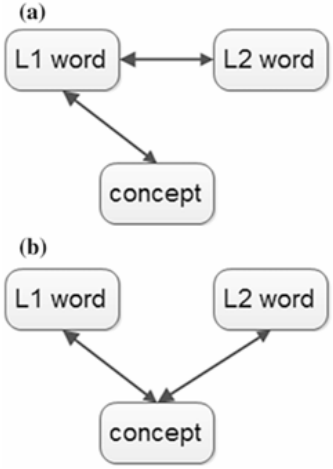
Figure 1 – Weinreich's classification of the bilingual representation



Source: Szubko-Sitarek, 2015, p. 69.
Note: a) coordinate, b) compound, c) subordinate.

Weinreich's classification influenced the word association and the concept mediation models proposed by the scholars Potter, So, Von Eckardt and Feldman (1984). While Weinreich's subordinate model influenced the word association model, Weinreich's compound model influenced the concept mediation model (Szubko-Sitarek, 2015). These models discussed the dependency or independency structure of bilingual language processing, whether the L2 word is connected to the meaning through the L1 word or L1 and L2 are connected directly to their representation (Tokowicz, 2015). Potter, So, Von Eckardt and Feldman's models (1984) are represented in Figure 2:

Figure 2 – Potter, So, Von Eckardt and Feldman's word association and concept mediation models



Source: Szubko-Sitarek, 2015, p. 78.
Note: a) The word association model. b) The concept mediation model.

The study of the scholars Potter, So, Von Eckardt and Feldman (1984) investigated both models shown above, and the results demonstrated that the concept mediation model was a more accurate model of bilingual word representation. Weinreich's classification (1953) as well as the models of Potter, So, Von Eckardt and Feldman (1984) exerted influence on future bilingual language processing models. As Weinreich (1953) and Potter, So, Von Eckardt and Feldman (1984) demonstrated, the major issue concerning the bilingual mental lexicon is whether both languages overlap and interact with one another in bilinguals' word representation and processing (Marian; Spivey, 2003).

At that time, the multilingual lexicon was contemplated as the same as the bilingual lexicon. Vildomec (1963) was the first to argue about non-native language transfer and to discuss that more than one language can influence a target language. Although Vildomec's claim (1963), bilinguals and multilinguals were assumed to share the same lexicon structure until the establishment of the field of TLL. Recent researchers have reported that adding more than two languages expands the investigation in relation to the multilingual lexicon (e.g., Westergaard *et al*., 2017; Smidfelt, 2018; Mulík; Carrasco-Ortiz; Amengual, 2019; Bogulski; Bice; Kroll, 2019; Toassi; Mota; Teixeira, 2020; Germanovna; Viktoroyna; Vladimirovna, 2021; Hirosh; Degani, 2021; Carvalho; Mota; Rigatti, 2022; Stoehr *et al*., 2023; Toassi *et al*., 2023). Since the multilingual lexicon is not an extension of the bilingual lexicon, word representation and processing have begun to be investigated in the memory of multilinguals (Lemhöfer, 2023).

Considering that the mental lexicon sets up the words users retain in their minds, lexical access is the action to retrieve the words available in the mental lexicon and their meanings (Dijkstra, 2005; Szubko-Sitarek, 2015). One of the major issues in the multilingual lexicon concerns the structure and processing (Lemhöfer, 2023). Hence, the issue of whether word representation or storage is separated or integrated, and whether lexical access processing is selective or non-selective, has begun to be investigated in the multilingual mental lexicon (Szubko-Sitarek, 2015; Lemhöfer, 2023). Some studies have interpreted languages as independent and integrated into the same mental lexicon (Toassi; Mota; Teixeira, 2020; Toassi; Mota, 2021; Carvalho; Mota; Rigatti, 2022).

The literature has related lexical storage with the modularity theory and connectionism, the two hypotheses of lexical storage (Szubko-Sitarek, 2015). According to the modularity hypothesis, multilinguals have one system, or module, for each of their languages (Szubko-Sitarek, 2015). On the other hand, according to connectionist models, the different languages of multilinguals interconnect through neurons in the brain's network (Szubko-Sitarek, 2015).

The connectionist models question the symbolic paradigm's assumption, which assumes that "mental operations involve the manipulation of symbols" (Singleton 2000, p. 179). Instead of considering the mental lexicon as a manipulation of the rules, the connectionist models define the mental lexicon as "… networks of interconnected nerve cells (neurons) that exchange simple signals, called activations, over connections." (Hebb, 1949; Murre, 2005, p. 156). In addition, while the modularity hypothesis understands knowledge as context-independent (Szubko-Sitarek, 2015), the connectionist models understand knowledge as context-dependent from a usage-based perspective (Ellis, 2010).

Following the discussion of lexical storage, the debate concerning the one-store or the two-store paradigm, also known as non-modular and modular (Roberts, 2016), has increased over the years. The discussion focused on the issue of word representation, whether there was a single memory or one memory for each language of a multilingual (Szubko-Sitarek, 2015). However, the representation of words in the memory of multilinguals does not rely only on the number of systems, but also on the interconnection of lexical and conceptual levels between the languages (Szubko-Sitarek, 2015).

Regarding the processing issue, the selective versus non-selective processing discussion addresses the competition among languages in the processing of multilinguals. The question that intrigues researchers is the extent of language activation. It is unknown whether only the target language is activated or all languages of multilinguals, including the non-target languages, are activated and compete for selection (Toassi, 2016). The selective access is usually linked with separate lexical representations and non-selective access linked with an integrated lexicon (Van Heuven; Dijkstra; Grainger, 1998). However, Kroll and Sunderman (2010) discuss that the representation and processing access are independent from each other and other options should be considered, such as separate lexical representations with non-selective access and a unified lexicon with selective access. To gain a better understanding of the multilingual mental lexicon, it is important to highlight specific models of the lexicon. In the following subsection, I will introduce the most important models of bilingual and multilingual lexical and semantic memory.

2.4.1 Models of lexical access

The models of bilingual and multilingual lexical access describe how multilinguals organise, store and associate linguistic knowledge in the mind (De Angelis, 2007). The most important models discussed in the present study are: The Revised Hierarchical Model (RHM),

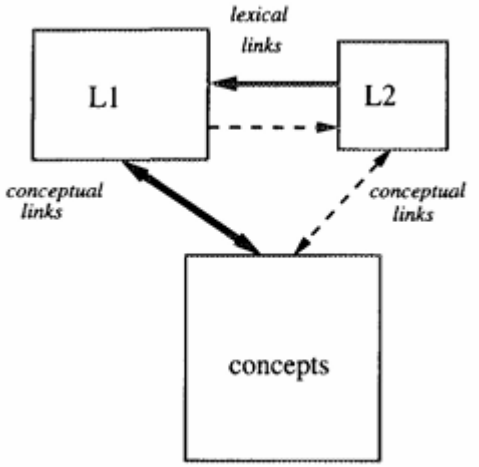
proposed by Kroll and Stewart (1994), the Bilingual Interactive Activation (BIA), presented by Dijkstra and Van Heuven (1998), the Multilingual Interactive Activation model (MIA) proposed by Dijkstra (2003), the Bilingual Interactive Activation plus model (BIA+), proposed by Dijkstra and Van Heuven (2002), the Multilink model developed by Dijkstra *et al.* (2019) and the Multilink + model proposed by Dijkstra *et al.* (2022).

2.4.1.1 The Revised Hierarchical Model

The RHM (Kroll; Stewart, 1994) was influenced by the hierarchical view of bilingual representation proposed by the scholars Potter, So, Von Eckardt and Feldman (1984). The term hierarchical refers to the hierarchical interconnection between the L1 and the L2 (Kroll; Stewart, 1994). Aiming to investigate the bilingual memory, Kroll and Stewart (1994) conducted a study with Dutch-English bilinguals. The research addressed bilingual word production and translation through a translation and a picture naming task, which supported the idea that the connections between the languages did not present the same strength. The results found that translations were slower from the L1 to the L2 and faster from the L2 to the L1 (Kroll; Stewart, 1994). Moreover, their findings showed that concept mediation in translation is stronger from the L1 to the L2 and weaker from the L2 to the L1 (Kroll; Stewart, 1994).

Grounded on their findings, Kroll and Stewart (1994) proposed the RHM. Kroll and Stewart (1994) combined the word association and the concept mediation (Potter; So; Von Eckardt; Feldman, 1984) in the design of the RHM. According to Kroll and Stewart (1994), the bilingual memory is bidirectional. However, the word association and the concept mediation depend on proficiency. At early stages of language translation, the L2 is lexically mediated through the L1 and the L1 is conceptually mediated (Tokowicz, 2015). In other words, the L1 is connected stronger to semantic or conceptual information and connected weaker to the L2 lexical form translation (Tokowicz, 2015). On the other hand, the L2 is connected more weakly to semantic or conceptual information and more strongly to lexical form translation (Tokowicz, 2015). The RHM of lexical and conceptual representation in bilingual memory is demonstrated in Figure 3:

Figure 3 – The RHM of lexical and conceptual representation in bilingual memory



Source: Kroll; Stewart, 1994, p. 158.

The RHM proposed how language learners acquire new words in another language. As stated by the authors of the RHM (Kroll; Stewart, 1994), as proficiency increases in the new language acquired, the L2 obtain direct conceptual links. However, the lexical links remain from the L2 to the L1. For this reason, this model is called asymmetric (Kroll; Stewart, 1994), as L1 and L2 present a lack of equality in the lexical and conceptual links. Another characteristic of this model is that the RHM is part of the modularity hypothesis (Szubko-Sitarek, 2015), as the model assumes that words are stored in separate lexicons and lexical access is selective (Kroll; Stewart, 1994; Desmet; Duyck, 2007).

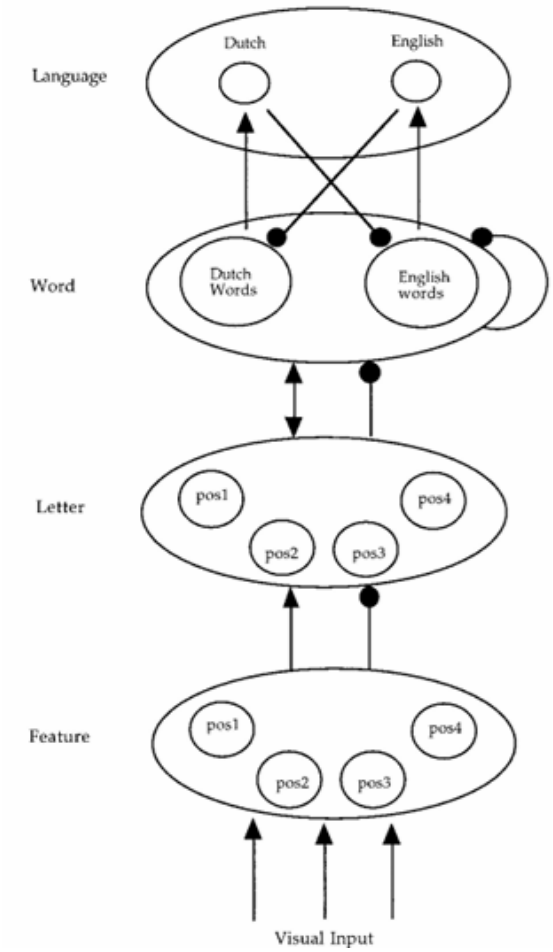
Despite RHM's findings about the bilingual mental lexicon, some scholars (e.g., De Angelis, 2007; Toassi; Mota, 2015) have observed that the RHM is not suitable for multilinguals. The RHM does not allow us to discuss when a third language is included in the field of third language acquisition (De Angelis, 2007; Toassi; Mota, 2015), as the model follows the modularity hypothesis (Szubko-Sitarek, 2015) and the monolingual view of bilingualism (Grosjean, 1989, 2008). Furthermore, the RHM cannot explain the process of visual word recognition (Tokowicz, 2015), which is the domain that this study will investigate CLI at the lexical level. For this reason, I will discuss other models that are recommended to multilinguals, as the BIA, the MIA, the BIA+, the Multilink and the Multilink + models.

2.4.1.2 The Bilingual Interactive Activation model, the Multilingual Interactive Activation model and the Bilingual Interactive Activation plus model

The BIA (Dijkstra; Van Heuven, 1998) was designed based on the Interactive Activation model (IA) of McClelland and Rumelhart (1981). While the IA was developed for monolingual

word recognition, the BIA expanded the IA and developed a model for bilingual word recognition (Grainger; Dijkstra, 1992; Dijkstra; Van Heuven, 1998; Murre, 2005; Lemhöfer, 2023). Both the IA and the BIA share the same settings. From a bottom-up process, the input activates visual features, meaning that letter representations are activated, following word representation (Lemhöfer, 2023). Two features were added in the BIA, the addition of one more language in a shared lexicon at the word level and the addition of two language nodes that are connected to the word nodes (Dijkstra; Van Heuven, 1998; Van Heuven; Dijkstra; Grainger, 1998; Lemhöfer, 2023). The four levels of the BIA are described in Figure 4:

Figure 4 – The BIA model



Source: Van Heuven; Dijkstra; Grainger, 1998, p. 475.

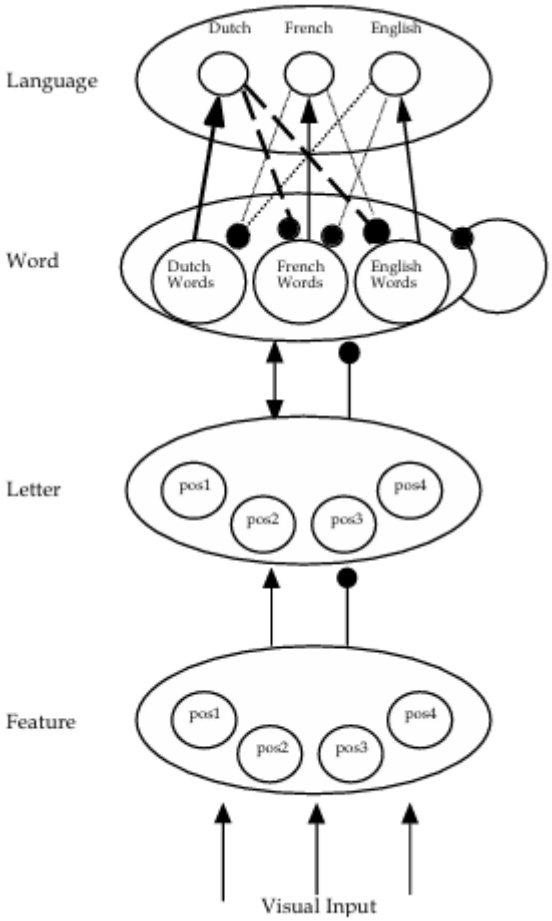
The BIA model presents that as soon as a string of letters is seen in visual input, that string activates the feature level. The BIA model follows the activation of letters that are compatible with the features and the inhibition of letters that are incompatible with the features at the letter level. The letter level leads to the activation of words compatible with the letters at the word level and to the respective language node. Moreover, the language node level inhibits

the words of the other language (Dijkstra; Van Heuven, 1998; Szubko-Sitarek, 2015; Tokowicz, 2015).

The BIA model supports visual word recognition as a bottom-up and a top-down process. The bottom-up process consists of the activation of small features until words (Traxler, 2012; Szubko-Sitarek, 2015). The top-down process is revealed at the fourth level when the language node inhibits the other language's words (Dijkstra; Van Heuven, 1998; Van Heuven; Dijkstra; Grainger, 1998). Through the language node level, the BIA express both selective and non-selective results (Van Heuven; Dijkstra; Grainger, 1998; Lemhöfer, 2023). Non-selective process as languages are stored in only one integrated lexicon system in which all lexical representations are activated (Szubko-Sitarek, 2015; Mota; Rigatti; Toassi, 2023; Lemhöfer, 2023; Van Heuven; Dijkstra, 2023) and selective process through the suppression of the non-target language (Van Heuven; Dijkstra; Grainger, 1998; Mota; Rigatti; Toassi, 2023; Lemhöfer, 2023). The BIA highlights that the frequency, proficiency and recency of words influence both bottom-up and top-down processes (Dijkstra; Van Heuven, 1998; Dijkstra, 2005).

The theoretical framework proposed first for monolinguals (IA) and bilinguals (BIA) was also extended to trilingual or even further to more languages in the MIA (Dijkstra, 2003; Szubko-Sitarek, 2015). The MIA is also known as the Trilingual Interactive Activation model – TIA (Szubko-Sitarek, 2015), but in this study, I will refer to the model as proposed by Dijkstra – MIA (2003). The MIA presented the same architecture as the BIA model (Dijkstra, 2003). However, one more lexicon was added at the word level and one more language node was added at the language node level in the MIA (Dijkstra, 2003). The MIA model is demonstrated in Figure 5:

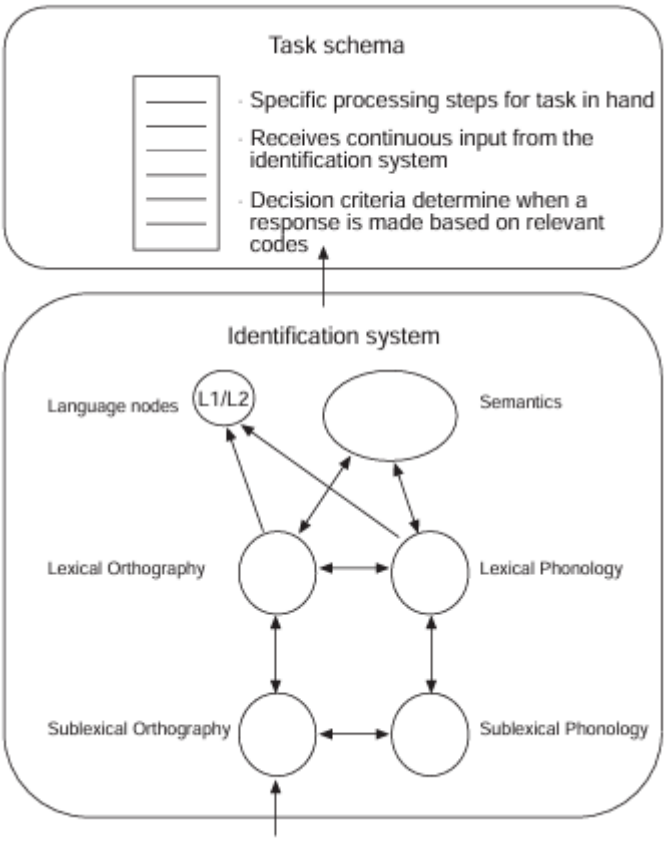
Figure 5 – The MIA model



Source: Dijkstra, 2003, p. 17.

As demonstrated above, the MIA is a model of multilingual word recognition that presents an integrated lexicon including three or more languages stored in the same lexicon and activation occurs in a non-selective way (De Angelis, 2007). As in the BIA, activation and inhibition occur through bottom-up and top-down processes (Dijkstra, 2003). Some limitations of the BIA model, and consequently of the MIA, such as the lack of semantic and phonological representations, led Dijkstra and Van Heuven (2002) to propose the BIA+ model. The model is referred to as BIA+, since both the BIA and the BIA+ are bilingual models and share the same fundamental settings (Tokowicz, 2015). The BIA+ model is demonstrated in Figure 6:

Figure 6 – The BIA+ model



Source: Dijkstra; Van Heuven, 2002, p. 182.

The BIA+ model is described as a model that shares an integrated lexicon and has non-selective access (Dijkstra; Van Heuven, 2002; Mota; Rigatti; Toassi, 2023). As shown above, the BIA+ model demonstrates that the similarity of the input word activates sublexical and lexical orthographic representations, so then phonological and semantic representations are activated in the word identification system (Dijkstra; Van Heuven, 2002; Van Assche; Duyck; Hartsuiker, 2012; Tokowicz, 2015; Paap, 2019; Mota; Rigatti; Toassi, 2023; Van Heuven; Dijkstra, 2023). According to the temporal delay assumption, phonological and semantic representations are activated later compared to the orthographic representations and as a result crosslinguistic will be larger from L1 to L2 than L2 to L1 (Dijkstra; Van Heuven, 2002). As in the BIA model, frequency, recency of use and proficiency influence the activation (Dijkstra; Van Heuven, 2002).

Following orthographic, phonological and semantic activation, language activation is linked to its language nodes within the word identification system (Dijkstra; Van Heuven, 2002). In the BIA+ model, the language node demonstrates the language to which it belongs (Van Assche; Duyck; Hartsuiker, 2012). However, the language nodes do not influence word activation. Therefore, there is no top-down inhibition from language nodes to words, as the

word identification system is not connected to the language processing system in the task schema (Paap, 2019; Van Heuven; Dijkstra, 2023). Hence, non-linguistic information is not recognised by the word identification system, the non-linguistic information influences only the task/decision system, and the word identification system is limited to linguistic information (Dijkstra; Van Heuven, 2002; Paap, 2019).

The BIA+ model reveals that the word identification system and task/decision system are interconnected, and the two parts are to a certain extent independent (Dijkstra; Van Heuven, 2002). In the word identification system, the bottom-up process occurs from words to languages, providing the output to the task/decision system, which uses the activation from the word identification system to oversee the decision mechanism (Dijkstra; Van Heuven, 2002; Dijkstra, 2005). The task/decision system manages the cognitive operations – task schemas (Van Heuven; Dijkstra, 2023). While in the word identification system occurs the visual word recognition, in the task/decision system occurs the response to the corresponding activated representations (Dijkstra; Van Heuven, 2002).

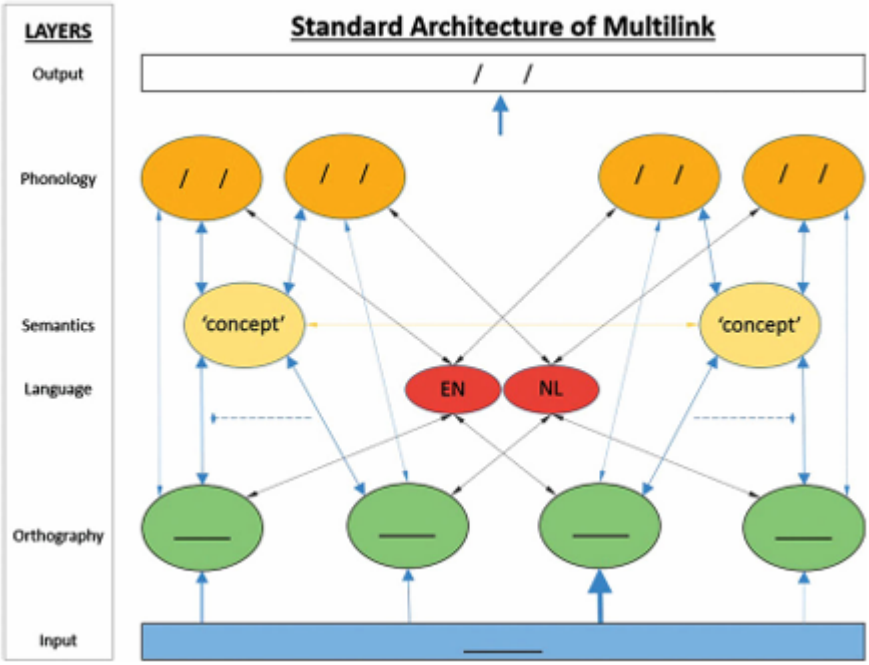
The BIA, the MIA and the BIA+ are described as computational models as the models rely on theoretical data simulation through the lexicon (Murre, 2005; Szubko-Sitarek, 2015). Moreover, the BIA, the MIA and the BIA+ are labelled connectionist models as the models aim to investigate how language activation spreads through the neurons in the brain (Szubko-Sitarek, 2015; Mota; Rigatti; Toassi, 2023). The BIA, the MIA and the BIA+ present both simulations of computer models and neural processing characteristics (Van Heuven; Thomas, 2005). Furthermore, the BIA, the MIA and the BIA+ are named localist as representation of words occurs through a single unit or nodes within the network (Van Heuven; Thomas, 2005; Szubko-Sitarek, 2015). From the input, the units as letter features, letter and words are activated, so then the connection strengths are predicted to simulate the theory and to investigate the static structure (Van Heuven; Thomas, 2005; Ellis, 2010). Experience does not influence the process of learning in the localist representation as in the distributed representation, rather the localist representation examines the unchanged structure (Van Heuven; Thomas, 2005). In summary, the BIA, the MIA and the BIA+ are classified as localist connectionist computational models of visual word recognition.

2.4.1.3 The Multilink and the Multilink + model

In recent years, the Multilink and the Multilink + models have been discussed and classified as localist connectionist computational models of visual word recognition, as the

BIA, the MIA and the BIA + (Dijkstra *et al.*, 2019). The Multilink model combines assumptions of both the BIA+ (Dijkstra; Van Heuven, 2002) and the RHM (Kroll; Stewart, 1994) regarding word form and meaning during visual word recognition and production (Dijkstra *et al.*, 2019). According to the Multilink model, lexical access is non-selective, and representations are shared within an integrated lexicon (Dijkstra *et al.*, 2019; Van Heuven; Dijkstra, 2023). The Multilink model is illustrated in Figure 7:

Figure 7 – The Multilink model



Source: Dijkstra *et al.* (2019, p. 06)

As demonstrated above, input processing occurs via orthographic activation, which then activates semantic representations, which in turn stimulate phonological representations of the non-target language (Dijkstra *et al.,* 2019; Van Heuven; Dijkstra, 2023). The activation from semantics becomes easier to activate, as the input word activates different nodes to connect to semantics, instead of only one orthographic node (Dijkstra *et al*., 2019). Once a lexical item is recognised, the orthographic and phonological representations are linked via semantic representation, rather than the orthographic representation being linked directly to phonological representation (Dijkstra *et al*., 2019). Conversely, in the BIA+ model, the orthographic representation does not directly connect to a shared semantic representation (Dijkstra et al., 2019).

Word length input is allowed to be more extensive in the Multilink model (Dijkstra *et al*., 2019). The Multilink model activates words between 3 to 8 letter words and cognates with

different lengths, in contrast to the BIA+ model, which is limited to 4 or 5 letter words (Dijkstra *et al*., 2019). In addition, the Multilink model includes cognates and non-cognates in processing words from multiple languages, which can vary in frequency of use, length, and crosslinguistic similarity (Dijkstra *et al*., 2019; Van Heuven; Dijkstra, 2023). More recently, the Multilink model was renamed to the Multilink + model (Dijkstra *et al.*, 2022). As in the Multilink model, the Multilink + model links orthographic and phonological representations via semantic representation (Van Heuven; Dijkstra, 2023). However, the Multilink + model supports more languages and lexicons (Van Heuven; Dijkstra, 2023). In contrast to the Multilink model, the Multilink + model presents lateral inhibition (Van Heuven; Dijkstra, 2023). In summary, the RHM, the BIA, the MIA, the BIA+, the Multilink and the Multilink + model discuss lexical access and how bi/multilinguals select and organise their bi/multilingual lexicon. The models presented in this subsection will be significant for discussing crosslinguistic influence among Spanish, Brazilian Portuguese, and English. In the next section, I will introduce the empirical studies conducted at LabLing regarding CLI at the lexical level.

2.5 EMPIRICAL STUDIES CONDUCTED AT LABLING

There have been various studies on CLI conducted at the lexical level in the laboratory LabLing. In this dissertation, I will review five studies from LabLing. Toassi and Mota (2018), Toassi, Mota and Teixeira (2020), and Toassi and Mota (2021) follow from Toassi's doctoral thesis (2016) in which she shows that lexical access of multilinguals is qualitatively different from lexical access of bilinguals and monolinguals. Toassi (2016) investigated the Brazilian Portuguese, German and English language combination. Another significant study conducted at LabLing that I will present is the study by Carvalho, Mota and Rigatti (2022). This study follows Carvalho's master's dissertation (2023), in which she investigated the Brazilian Portuguese, English and Korean language combination. The final study that I will introduce is the doctoral thesis of Rigatti (2024) in which two studies were conducted regarding the Haitian Creole and Brazilian Portuguese language combination.

In her doctoral thesis, Toassi (2016) conducted three different studies to investigate lexical access of speakers of Brazilian Portuguese, German and English in language comprehension and production of English as a L2 and L3. Participants were distributed into three different groups. The Control Group 1 (CG1) consisted of native speakers of English. The Experimental Group 1 (EG1) consisted of native speakers of Brazilian Portuguese as L1 and

English as L2. The Experimental Group 2 (EG2) consisted of native speakers of Brazilian Portuguese as L1, German as L2 and English as L3.

In the first study Toassi (2016), published as Toassi and Mota (2018), investigated semantic priming effects in the production of English as L3. Forty-one participants performed a picture-naming task within the masked priming[13] paradigm. The picture-naming task presented seventy-two pictures to be named in English. The pictures were divided into three different lists to be presented in three different prime conditions. The prime words were the target language English in the Condition 1 (C1), Brazilian Portuguese native language in the Condition 2 (C2) and German nonnative language in the Condition 3 (C3). The results showed that German interfered in the production of English, indicating a processing cost in the response time of participants. Hence, the results supported the claim of asymmetry in the lexical organisation of trilinguals, as the results presented stronger links between L1-L2 and L1-L3 than L2-L3. The results provided evidence for the RHM model. In addition, the results supported the context of learning as a factor of influence, as participants learned the foreign language in their L1 environment. Overall, results provided evidence for an integrated multilingual lexicon and confirmed the claim that lexical access of multilinguals is qualitatively different from lexical access of bilinguals and monolinguals.

In the second study Toassi (2016), published as Toassi, Mota and Teixeira (2020), investigated the effect of triple cognates in the lexical access. Thirty-five participants performed an eye-tracking comprehension task with sixty experimental sentences. The critical words from the sentences were presented in the conditions English and Brazilian Portuguese double cognates (CGEP), English and German double cognates (CGEG) and English, German and Brazilian Portuguese triple cognates (CGT). The results showed an effect for triple cognate words, but not for double cognate words. The evidence demonstrates a facilitation in the processing cost/time for triple cognate words in the comprehension of English. Toassi, Mota and Teixeira (2020) highlight that even though the results were not significant for double cognate words, the facilitation effect for double cognate words cannot be denied. In summary, results demonstrated evidence for nonselective access and an integrated multilingual lexicon.

In the third study Toassi (2016), published as Toassi and Mota (2021), analysed the influence of cognate words in the oral production of L2 and L3 English speakers in terms of quantity and type of cognates. The study also investigated CLI in the production of English as L3. Twenty-eight participants were asked to narrate a story based on four pictures. The analysis

[13] Priming is the previous access to a word or concept in the mental lexicon (Toassi, 2016).

aimed to compare the number and types of cognates (double or triple cognate words) in the story. In addition, the analysis aimed to investigate CLI, more specifically, the influence of Brazilian Portuguese and/or German in the production of English. The results showed that EG2 produced more cognates than EG1, suggesting that German facilitated the processing of triple cognate words. Regarding CLI investigation, four narratives presented CLI in L3G. Borrowing, foreignising, and code-switching phenomena were found in CLI. The results provided evidence for language coactivation of multilinguals. The three studies supported the claim of Toassi (2016) that lexical access of multilinguals is qualitatively different from lexical access of bilinguals and monolinguals due to the increased complexity of crosslinguistic interactions among three or more languages. In addition, the results provided evidence for nonselective lexical access, an asymmetric lexical organisation and an integrated multilingual lexicon. Furthermore, the results provided evidence for the RHM, BIA+ model and Multilingual Processing model.

Carvalho, Mota and Rigatti (2022) conducted a study to investigate language selectivity in lexical access. Participants were native speakers of Brazilian Portuguese as L1, presented English as L2 and Korean as L3. Eighteen participants performed a word naming task, in which they read aloud 192 target words as fast as possible. The study measured phonological priming from L2 to L3 in two conditions: the phonological prime and the control prime. Hence, participants read the same target word two times, the first time preceded by the phonological prime and the second preceded by the control prime. These words were double cognate words, the Experimental Condition 1 (EC1), triple cognate words, the Experimental Condition 2 (EC1) and non-cognate words, the Control Condition (CC). Carvalho, Mota and Rigatti (2022) discussed that participants' L2 English spelling-sound knowledge was activated during the reading of L3 Korean words. In addition, the study provided evidence for nonselective in lexical access and a shared multilingual mental lexicon and evidence for BIA+ model.

Rigatti (2024) investigated, in her doctoral thesis, the effects of crosslinguistic interaction between Haitian Creole and Brazilian Portuguese on lexical access during the comprehension of spoken and written Brazilian Portuguese by native speakers of Haitian Creole. More specifically, Rigatti’s doctoral thesis investigated the effects of Brazilian Portuguese phonological awareness and the effects of reading habits on language processing in Brazilian Portuguese as L2. Rigatti (2024) conducted two different studies to examine the cognate effect across childhood, adolescence and adult developmental stages. In study 1, 48 native speakers of Haitian Creole, children and teenagers, performed a visual and an auditory lexical decision task in Brazilian Portuguese. Participants were international migrant students

attending schools in the public educational system. Both visual and auditory lexical decision tasks presented pseudowords, noncognate and double cognate words between Haitian Creole and Brazilian Portuguese. In these tasks, participants were asked to answer whether a string of letters or the word heard was or was not a real word. The results showed that double cognate words did not facilitate or inhibit lexical access in visual word recognition or listening. However, phonological awareness in Brazilian Portuguese was shown to influence lexical access in visual word recognition.

In study 2, thirty-five adult native speakers of Haitian Creole performed a visual lexical decision task, a visual self-paced sentence comprehension task and an auditory self-paced sentence comprehension task in Brazilian Portuguese. As in study 1, study 2 presented noncognate and double cognate words between Haitian Creole and Brazilian Portuguese. The results showed that double cognate words did not facilitate or inhibit lexical access in any task. In addition, reading habits in Brazilian Portuguese did not demonstrate to influence visual word recognition. In summary, Haitian Creole and Brazilian Portuguese double cognate words did not provide evidence of any effect on language processing by international migrant bilingual children, teenagers, and adults. The null results were related to the lack of linguistic knowledge and language skills in both study 1 and study 2. The low cognitive performance was related to the experience and to the social and environmental factors of the participants. Rigatti (2024) discussed the low socioeconomic status of the participants and proposed that the lack of linguistic knowledge and language skills was influenced by the environmental, linguistic and social experience of bi-multilinguals. Therefore, the studies introduced above are part of CLI studies at the lexical level conducted at LabLing. This research aims to contribute to a family of studies with a new language combination Spanish, Brazilian Portuguese and English. I will present an overview of the studies reviewed above in Table 1. In the next chapter, I will present the methodological procedures of this study, following Table 1.

Table 1 – Overview of the studies conducted at LabLing

(continued)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
Toassi; Mota, 2018.	(1) To investigate semantic priming effects in the production of English as L3.	Brazilian Portuguese–German–English: **CG1:** Native speakers of English **EG1:** Native speakers of Brazilian Portuguese as L1 English as L2 **EG2:** Native speakers of Brazilian Portuguese as L1 German as L2 English as L3	Picture naming task within the masked priming paradigm. **Prime words:** C1 English C2 Brazilian Portuguese C3 German	(1) Processing cost in German L2 in the production of English L3. (2) Organisation of the multilingual lexicon is asymmetric, as the results demonstrated stronger links between L1–L2 and L1–L3 than L2–L3. (3) Evidence for an integrated multilingual lexicon.	RHM model BIA+ model and Multilingual Processing model

Table 1 – Overview of the studies conducted at LabLing

(continued)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
Toassi; Mota; Teixeira, 2020.	(1) To investigate the effect of triple cognates in the lexical access.	Brazilian Portuguese–German–English: **CG1:** Native speakers of English **EG1:** Native speakers of Brazilian Portuguese as L1 English as L2 **EG2:** Native speakers of Brazilian Portuguese as L1 German as L2 English as L3	Eye-tracking comprehension task. **Double and Triple cognate words conditions:** CGEP CGEG CGT	(1) Facilitative effect in the processing cost/time for triple cognate words in the comprehension of English. (2) Evidence for nonselective access and an integrated multilingual lexicon.	BIA+ model and Multilingual Processing model

Table 1 – Overview of the studies conducted at LabLing

(continued)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
Toassi; Mota, 2021.	(1) To analyse the influence of cognate words in the oral production of L2 and L3 English speakers. (2) To investigate CLI in the production of English as L3.	Brazilian Portuguese–German–English: **CG1:** Native speakers of English **EG1:** Native speakers of Brazilian Portuguese as L1 English as L2 **EG2:** Native speakers of Brazilian Portuguese as L1 German as L2 English as L3	Narrative task **Triple cognates:** Brazilian Portuguese, German and English **Double cognates:** Brazilian Portuguese and English. German and English.	(1) Experimental Group 2 produced more cognates than Experimental Group 1. (2) Borrowing, foreignizing and code-switching phenomena were found in CLI. (3) Evidence of language coactivation of multilinguals.	BIA+ model and Multilingual Processing model

Table 1 – Overview of the studies conducted at LabLing

(continued)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
Carvalho; Mota; Rigatti, 2022.	(1) To investigate language selectivity in lexical access.	Brazilian Portuguese–English–Korean **Group** Native speakers of Brazilian Portuguese as L1 English as L2 Korean as L3	Word naming task **CC:** Non-cognate words **EC1:** English and Korean double cognate words **EC2:** Brazilian Portuguese, English and Korean triple cognate words	(1) Participants' L2 English spelling-sound knowledge was activated during the reading of L3 Korean words. (2) Evidence for nonselective in lexical access and a shared multilingual mental lexicon.	BIA+ model

Table 1 – Overview of the studies conducted at LabLing

(continued)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
Rigatti, 2024.	(1) To investigate the effects of crosslinguistic interaction between Haitian Creole and Brazilian Portuguese on lexical access during comprehension of spoken and written Brazilian Portuguese by native speakers of Haitian Creole.	Haitian Creole and Brazilian Portuguese **Group 1** Children and teenagers' native speakers of Haitian Creole Brazilian Portuguese as L2 **Group 2** Adult native speakers of Haitian Creole Brazilian Portuguese as L2	**Group 1:** A visual and an auditory lexical decision task in Brazilian Portuguese. **CC** noncognate words **C1** Haitian Creole and Brazilian Portuguese double cognate words.	**Group 1:** (1) Haitian Creole and Brazilian Portuguese double cognate words did not facilitate or inhibit lexical access in any task. (2) Phonological awareness in Brazilian Portuguese demonstrated to influence lexical access in Brazilian Portuguese visual word recognition.	Socioeconomic status of the participants overcame any lexical access model. Furthermore, the lack of linguistic knowledge and language skills were influenced by the environmental, linguistic and social experience of bi-multilinguals.

Table 1 – Overview of the studies conducted at LabLing

(continued)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
	(2) To investigate the effects of Brazilian Portuguese phonological awareness. (3) To investigate the effects of reading habits on language processing in Brazilian Portuguese as L2.		**Group 2:** A visual lexical decision task, a visual self-paced sentence comprehension task and an auditory self-paced sentence comprehension task in Brazilian Portuguese.	**Group 2:** (1) Haitian Creole and Brazilian Portuguese double cognate words did not facilitate or inhibit lexical access in any task. (2) Reading habits in Brazilian Portuguese did not demonstrate to influence Brazilian Portuguese visual word recognition. (3) The study did not show evidence to either the selective or the non-selective account.	

Table 1 – Overview of the studies conducted at LabLing

(completed)

Study	Objective	Participants	Task	Results	Lexical Access Model Favoured
			CC noncognate words **C1** Haitian Creole and Brazilian Portuguese double cognate words.	The null results were related to the lack of linguistic knowledge and language skills in both study 1 and study 2.	

Source: Elaborated by the author

3 METHOD

Having discussed the theoretical basis of this research, this chapter will provide a description of how this research was conducted. I will outline the main methodological procedures of this study into eight sections. I will present the research questions, hypotheses and rationale in section 3.1, the research design in section 3.2, the participants in section 3.3, the instruments required for data collection in section 3.4, the ethical procedures in section 3.5, the open science practices in section 3.6, the pre-pilot and the pilot study in section 3.7, and the procedures for data collection in section 3.8.

3.1 RESEARCH QUESTIONS, HYPOTHESES AND RATIONALE

The main objective of the present study was to investigate CLI in lexical access in English in native speakers of Spanish as a first language, who are also speakers of Brazilian Portuguese as a second language and are learning English as a third language at school in Brazil. The specific objectives of the present study were: (i) to examine if visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3 reflect cognate effects; (ii) to investigate if there are differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3. Following the main and specific objectives, the research questions and hypotheses for the present study were the following:

RQ1: How does visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2, and English as L3 reflect cognate effects?

H1a: Native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) in the school context will exhibit stronger cognate effects for Spanish – English double cognates compared to non-cognate words, as reflected in their visual word recognition during a self-paced reading task.

The rationale for this hypothesis follows from the literature on the multilingual lexicon, which suggests that cognates tend to facilitate language processing, leading individuals to access cognate words faster than non-cognates during visual word recognition (Traxler, 2012; Szubko-Sitarek, 2015; Cop *et al*., 2017; Bailey; Lockary; Higby, 2024). Hence, Spanish – English double cognates will demonstrate greater cognate effects than non-cognate words,

highlighting the connections between the L1 (Spanish) and the L3 (English) (Toassi; Mota, 2018; Vanlangendonck *et al*., 2020).

H1b: Native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) in the school context will exhibit stronger cognate effects for Brazilian Portuguese – English double cognates compared to non-cognate words, as reflected in their visual word recognition during a self-paced reading task.

As previously mentioned, cognates tend to facilitate language processing, leading individuals to access cognate words faster than non-cognates during visual word recognition (Traxler, 2012; Szubko-Sitarek, 2015; Cop *et al*., 2017; Bailey; Lockary; Higby, 2024). Thus, Brazilian Portuguese – English double cognates will demonstrate greater cognate effects than non-cognate words, accentuating the L2 status factor as a source of influence in L3 (Hammarberg, 2001; Vanlangendonck *et al*., 2020; Germanovna; Viktoroyna; Vladimirovna, 2021; Carvalho; Mota; Rigatti, 2022; Toassi *et al*., 2023).

H1c: Native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) in the school context will exhibit stronger cognate effects for triple cognates (Spanish – Brazilian Portuguese – English) compared to non-cognate words, as reflected in their visual word recognition during a self-paced reading task.

Following the literature, cognates tend to facilitate language processing, leading individuals to access cognate words faster than non-cognates during visual word recognition (Traxler, 2012; Szubko-Sitarek, 2015; Cop *et al*., 2017; Bailey; Lockary.; Higby, 2024). Therefore, triple cognates (Spanish – Brazilian Portuguese – English) will demonstrate greater cognate effects than non-cognate words, showing that the order in which the languages were learned (Spanish – Brazilian Portuguese) influences L3 learning (Engklish). Various empirical studies show evidence in favour of the idea of this hypothesis: Smidfelt, 2018; Mulík; Carrasco-Ortiz; Amengual, 2019**;** Toassi; Mota; Teixeira, 2020; Germanovna; Viktoroyna; Vladimirovna, 2021.

RQ2: Are there differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3?

H2a: Native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) in the school context will exhibit faster reading times for triple cognates (Spanish – Brazilian Portuguese – English) compared to Spanish – English (L1–L3) double cognates, reflecting enhanced lexical access across shared linguistic representations.

The rationale for this hypothesis follows from the literature on TLA, which suggests that the triple cognate facilitation effect presents many-to-one type of association during CLI (De Angelis, 2007) resulting in a cumulative rather than a single-sourced influence (Mulík; Carrasco-Ortiz; Amengual, 2019; Germanovna; Viktoroyna; Vladimirovna, 2021; Otwinowska, 2024). Furthermore, participants' metalinguistic knowledge and awareness could benefit from learning a new language (D'angelo, 2023), resulting in an easier and faster facilitation lexical access to triple cognates compared to Spanish – English (L1–L3) double cognates.

H2b: Native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) in the school context will exhibit slower reading times for triple cognates (Spanish – Brazilian Portuguese – English) compared to Brazilian Portuguese – English (L2–L3) double cognates, reflecting increased processing demands for lexical access across multilinguals representations.

Following the literature on TLA, the L2 status factor influences the activation of the prior language to transfer into L3 rather than L1 (Hammarberg, 2001). Thus, when triple cognate words are compared to Brazilian Portuguese – English (L2–L3) double cognates, the L2 status factor is the main source of influence in L3. (Cenoz; Hufeisen; Jessner, 2001; Hammarberg, 2001; Jessner, 2006; Bardel; Falk, 2007; Germanovna; Viktoroyna; Vladimirovna, 2021; Carvalho; Mota; Rigatti, 2022).

H2c: Native speakers of Spanish (L1), who are also speakers of Brazilian Portuguese (L2) and are learning English (L3) in the school context will exhibit slower reading times for Spanish – English (L1–L3) double cognates compared to Brazilian Portuguese – English (L2–L3) double cognates and triple cognate words (L1–L2–L3), highlighting the influence of linguistic proximity and activation patterns in lexical processing.

The rationale for this hypothesis is consistent with the hypothesis which claims the order of learning the languages is the most important factor. Following the idea that the L2 status factor is the main source of influence in L3, Brazilian Portuguese – English (L2–L3) double cognates and triple cognate words (L1–L2–L3) will be activated faster when compared to Spanish – English (L1–L3) double cognates (Cenoz; Hufeisen; Jessner, 2001; Hammarberg, 2001; Jessner, 2006; Bardel; Falk, 2007; Stoehr *et al*., 2023). In addition, both Brazilian Portuguese and English languages are based on explicit knowledge and require declarative memory, which facilitates transfer between L2–L3 in comparison with L1 that is implicitly acquired and requires procedural memory (Westergaard *et al*., 2017).

3.2 RESEARCH DESIGN

The present study is a quasi-experimental study (Mackey; Gass, 2005; Goodwin; Goodwin, 2016) that followed a within-subject design. The number of participants included in the pre-pilot, pilot and data collection was 38. The following instruments were applied: (1) a biographical and language background questionnaire; (2) an English proficiency task; (3) a self-paced reading task; (4) a meaning recognition task.

3.3 PARTICIPANTS

To recruit participants, I contacted schools via phone calls and email and visited nine state public schools located in the Grande Florianópolis region, in Santa Catarina (SC), Brazil. The participants of the present study were recruited from seven different state public schools in Florianópolis (see Appendix A). This study followed the criterion of including native speakers of any variety of Spanish (L1) who were also speakers of Brazilian Portuguese (L2) and were learning English (L3) as a school subject. Furthermore, this study followed the criterion to include participants who had lived for at least one year in Brazil, had attended the 9th year of elementary school II or of *Educação de Jovens e Adultos (EJA)*[14] in Brazil and did not have knowledge of other languages, besides Spanish (L1), Brazilian Portuguese (L2) and English (L3). All adolescents were neurotypical and had normal or corrected sight (when impaired), as reported in the Language Experience and Proficiency Questionnaire – LEAP-Q (Kaushanskaya; Blumenfeld; Marian, 2020), as described in Subsection 3.4.1.

In total, 195 native speakers of different varieties of Spanish attending high school in the selected schools were invited to participate in the present study. From these 195, 52 students accepted the invitation. However, six participants were excluded as they did not meet the criteria of having lived for at least one year in Brazil, attending the 9th year of elementary school II or of EJA in Brazil and/or having knowledge of only Spanish as a L1, Brazilian Portuguese as a L2 and English as a L3. Of the six excluded participants, one participant did not attend the 9th year of elementary school II or EJA in Brazil, another participant had Brazilian Portuguese as a L1 and four participants had knowledge of four languages. I also excluded another four participants owing to uncorrected vision problems and another participant chose to withdraw from the study. Additionally, 8 participants were excluded following data collection as they

[14] EJA is a segment offered in Brazil for people from 15 years old who are attending any grade of the elementary I, elementary II or high school.

answered the questionnaire declaring both English and Brazilian Portuguese as L2 and both English and Brazilian Portuguese as L3. Following data collection, I examined all questions from the questionnaire, such as the age at which participants began learning each language, as well as the date of immigration to Brazil. At this stage, I ascertained that English was their L2 and Brazilian Portuguese was their L3. Therefore, a total of 19 participants were excluded from the study.

The final sample of participants consisted of one group of 33 sequential multilinguals (20 females), with ages ranging from 14 to 18 years old (Mage = 16.58, SD = 1.00). In the following, I give a brief account of the participants' profile based on the LEAP-Q (Kaushanskaya; Blumenfeld; Marian, 2020), as described in Subsection 3.4.1. At the time of data collection, participants were attending the 1st, 2nd or 3rd year of high school, as demonstrated in Table 2:

Table 2 – Percentage of students per high school year

Year of high school	**Percentage**
1st year	16 (48.5%)
2nd year	8 (24.2%)
3rd year	9 (27.3%)

Note: N=33 (percentage).

Source: Elaborated by the author.

The percentage of the Spanish varieties spoken by participants is summarised in Table 3:

Table 3 – Percentage of Spanish Varieties

Spanish Variety	**Percentage**
Venezuelan	21 (63.6%)
Colombian	6 (18.2%)
Chilean	3 (9.1%)
Cuban	2 (6.1%)
Argentinian	1 (3.0%)

Note: N=33 (percentage).

Source: Elaborated by the author.

When asked about the cultures participants identified with, participants' answers mentioned 13 cultures (only one participant did not respond to this question). Participants selected Brazilian (26), Venezuelan (19), Argentinian (8), Chilean (4), Cuban (3) and Colombian (2) cultures. The Latin, Panamanian, Peruvian, Spanish, Japanese and French cultures were chosen just once and the American culture was chosen twice.

Participants reported having formal instruction in Brazilian Portuguese, Spanish and English at school. Concerning the order of dominance of the languages, 29 participants reported that the most dominant order was Spanish as L1, Brazilian Portuguese as L2 and English as L3. Three participants reported that the order of dominance was Brazilian Portuguese as L1, Spanish as L2 and English as L3. Participants always stated English as the least dominant language when listing the order of dominance among Spanish, Brazilian Portuguese and English. The percentage of the order of dominance is demonstrated in Table 4 (one participant did not answer this question):

Table 4 – Percentage of the order of dominance

Order	Percentage
SP1BP2EN3	29 (90.6%)
BP1SP2EN3	3 (9.4%)

Note: SP1=Spanish as L1; BP2=Brazilian Portuguese as L2; EN3=English as L3. The same applies to BP1, SP2 and EN3. N=32 (percentage).

Source: Elaborated by the author.

Participants reported being immersed in the Brazilian Portuguese language for 16 to 141 months in Brazil (M = 72.30, SD = 33.56). Regarding immigration, two participants reported that they immigrated to another country. Participant 1 reported that they immigrated to Peru for about 48 months and participant 2 reported that they immigrated to Colombia for about 12 months. Additionally, participants were asked about their school age and grade level when they first enrolled in school in Brazil. Participants reported that their school age ranged from 5 to 15 years old (Mage = 11.35, SD = 2.65) and the grade level reported varied across the levels from the elementary school I and elementary school II. Two participants did not answer the question regarding the school age at which they first enrolled in school in Brazil. The percentage of the grade levels is demonstrated in Table 5 (one participant did not answer this question):

Table 5 – Percentage of the grade levels

Elementary school I	Percentage
1st grade	6 (18.8%)
4th grade	1 (3.1%)
5th grade	2 (6.3%)
Elementary school II	**Percentage**
6th grade	9 (28.1%)
7th grade	4 (12.5%)
8th grade	6 (18.8%)
9th grade	4 (12.5%)

Note: Minor discrepancies in totals are due to rounding. N=32 (percentage).

Source: Elaborated by the author.

Regarding the age of onset of learning, participants reported beginning to learn Spanish at birth. The age of onset of learning of Brazilian Portuguese ranged from 5 to 15 years old (M = 10.52, SD = 3.03) and of English ranged from 6 to 17 years old (M = 11.10, SD = 3.34). Two participants did not answer the question concerning the age of onset of learning. When asked, participants reported having attended a language course outside of school in a language other than their native language. Two participants reported having attended a Brazilian Portuguese course for 12 months, and nine reported having attended an English course for 1 to 24 months.

Participants' proficiency in English was assessed by means of the Vocabulary Levels Test – VLT (Nation, 1983; Schmitt; Schmitt; Clapham, 2001; Webb; Sasao; Balance's, 2017), as shown in Subsection 3.4.2 and Appendix B. The scores on the English proficiency task ranged from 3 to 30 (M = 14.70, SD = 7.23), which determined the English knowledge of participants. In addition, participants' proficiency in English was assessed by means of a self-rated Spanish, Brazilian Portuguese and English proficiency in the LEAP-Q, as described in Subsection 3.4.1. Participants rated their speaking, understanding, reading and writing skills on a scale from 0 to 10. To describe participants' answers in this dissertation, I grouped the scores into low (0–2), moderate (3–6), and high (7–10) self-rated proficiency categories. The percentage of each group is presented according to each language and skills in Table 6:

Table 6 – Percentage of the score skills

Skill	Score	Spanish	Brazilian Portuguese	English
Speaking	Low	–	–	23 (69.7%)
	Moderate	2 (6.1%)	3 (9.1%)	10 (30.3%)
	High	31 (93.9%)	30 (90.9%)	–
Understanding	Low	–	–	16 (48.5%)
	Moderate	1 (3.0%)	1 (3.0%)	16 (48.5%)
	High	32 (97.0%)	32 (97.0%)	1 (3.0%)
Reading	Low	–	–	18 (54.5%)
	Moderate	1 (3%)	4 (12.1%)	14 (42.4%)
	High	32 (97.0%)	29 (87.9%)	1 (3.0%)
Writing	Low	1 (3%)	–	23 (69.7%)
	Moderate	2 (6.1%)	8 (24.2%)	9 (27.3%)
	High	30 (90.9%)	25 (75.8%)	1 (3.0%)

Note: N=33 (percentage).

Source: Elaborated by the author.

Both objective and subjective assessments of English proficiency demonstrated that participants had low levels. The mean (M = 14.70, SD = 7.23) of the formal task was below the minimum score of 26 to 30 points required to assess participants' English knowledge, as described in Subsection 3.4.2. However, English proficiency was not a criterion to include

participants in this study. The English proficiency task was aimed at helping to determine the profile of the population of this study. In contrast, the subjective assessment as of Brazilian Portuguese showed high scores as much as Spanish native language. Regarding language use, participants reported using Spanish as much as Brazilian Portuguese. According to the answers of participants, the use of English did not co-occur as frequently as the use of Spanish and Brazilian Portuguese. Table 7 demonstrates the percentage of time participants were exposed, the percentage of cases they would choose to read and the percentage of time they would speak in each language (one participant did not answer this question):

Table 7 – Percentage of the exposure time, reading and speaking

	Spanish	**Brazilian Portuguese**	**English**
Exposure Time	41.2%	48.4%	10.4%
Reading	51.6%	40.5%	7.9%
Speaking	53.6%	39.9	6.5%

Note: N=32. The sum of the percentages totalled 100%.

Source: Elaborated by the author.

Participants reported that they were most exposed to Spanish and Brazilian Portuguese when interacting with friends, family and teachers, reading, studying, watching TV or streaming services, listening to the radio, music, podcasts, audiobooks and using social media or the internet. Additionally, the use of Spanish and Brazilian Portuguese was frequent when participants alternated between the two languages. Only three participants did not respond to the question when they alternated languages. Participants reported alternating between Spanish and Brazilian Portuguese languages when talking to their parental figure (at about 68.3% in Spanish and 31.7% in Brazilian Portuguese), family (at about 71.4% in Spanish and 28.6% in Brazilian Portuguese) and friends (at about 35% in Spanish and 65% in Brazilian Portuguese). When alternating languages among Spanish, Brazilian Portuguese and English only five participants reported to alternate when talking to their parental figure (at about 67% in Spanish, 30% in Brazilian Portuguese and 3% in English), four participants reported to alternate when talking to their family (at about 68% in Spanish, 25% in Brazilian Portuguese and 7% in English) and ten participants reported to alternate when talking to their friends (at about 31% in Spanish, 60% in Brazilian Portuguese and 9% in English). Regarding participants' parental education, Table 8 demonstrates their level of education (three participants did not answer this question):

Table 8 – Percentage of the level of education

Level of Education	Parental Figure 1	Parental Figure 2
Incomplete elementary education.	–	17,9%
Complete elementary education.	3,4%	–
Incomplete high school education.	17,2%	7,1%
Complete high school education.	20,7%	39,3%
Incomplete higher education (bachelor's or professional degree).	10,3%	10,7%
Complete higher education (bachelor's or professional diploma).	41,4%	21,4%
Incomplete postgraduate education.	–	–
Complete postgraduate education.	6,9%	3,6%

Note: Minor discrepancies in totals are due to rounding. N=30.
Source: Elaborated by the author.

Furthermore, participants reported the occupation of parental figures as hairdresser, nail specialist, caregiver, artisan, cooker, housekeeper, babysitter, massage therapist, tour guide, mechanic, security, call centre agent, seller, carpenter, electrician, luthier, clerk, receptionist, bricklayer, shelf stocker, uber driver, car hire agent, teacher, stylist, psychologist, tourism agent, chef, manager, doctor, police officer and engineer (four participants did not answer this question). Having described the participants and characteristics of their parental figures, I will present the instruments used in this study in the next section.

3.4 INSTRUMENTS

This section introduces the instruments required for data collection. The instruments used were (1) a biographical and language background questionnaire; (2) an English proficiency task; (3) a self-paced reading task; (4) a meaning recognition task. I will describe the four instruments in this section.

3.4.1 The biographical and language background questionnaire

Bilinguals are not equal and differ in their experiences (De Bruin, 2019). For this reason, a biographical and language background questionnaire was applied to obtain information that would help build the profile of the participants. Specifically, a biographical and language background questionnaire would help gather information about participants' language experiences, such as language exposure, language use, language history, the current use of their languages in their social context, and proficiency in each language (Surrain; Luk, 2019).

In the present study, I used a version of the Language Experience and Proficiency Questionnaire – LEAP-Q (Kaushanskaya; Blumenfeld; Marian, 2020), as this questionnaire was designed for multilinguals from the age of 14 to 80 to collect self-reported proficiency and experience with each language. Furthermore, I selected the LEAP-Q due to the 11-point rating scales, which provide a large scale concerning bi-multilingualism and to the recommendation for those who are in an immersion in the L2 (Kaushanskaya; Blumenfeld; Marian, 2020).

The questionnaire was adapted for the purposes of the present study and included questions about how participants alternate between their languages. Other questions included exposure through the internet and media and socioeconomic status. Furthermore, the questionnaire included a self-reported proficiency measure containing a gradient scale, as bilingualism is interpreted as a continuous, rather than a categorical experience (Surrain; Luk, 2019). The LEAP-Q was completed on a hard copy.

3.4.2 The proficiency task

Besides the self-reported proficiency in the questionnaire, a formal test was conducted, which evaluated proficiency in English, as discussed in the multi-dimensional nature of proficiency (De Bruin, 2019). The present study used the freely available updated version[15] (Webb; Sasao; Balance, 2017) of the Vocabulary Levels Test – VLT (Nation, 1983; Schmitt; Schmitt; Clapham, 2001; Webb; Sasao; Balance's, 2017). The VLT aims to verify the extent participants can recognise form and meaning connections of words (Webb; Sasao; Balance, 2017). This study used the 1000-word frequency level to measure receptive English knowledge of participants, who are learning English as a school subject – L3 (Webb; Sasao; Balance, 2017).

The proficiency task was presented in a hard copy. The task presented 30 questions, divided into 10 clusters (3 questions per cluster). Participants were instructed to read the questions in English positioned horizontally in each cluster. Then, participants matched the questions positioned horizontally with words in English positioned vertically. Each cluster presented 3 questions horizontally and 6 words vertically (3 keys and 3 distractors). For a complete overview of the proficiency task, see Appendix B. Participants got a point for each correct response (Webb; Sasao; Balance, 2017). Hence, the maximum score was 30 points in

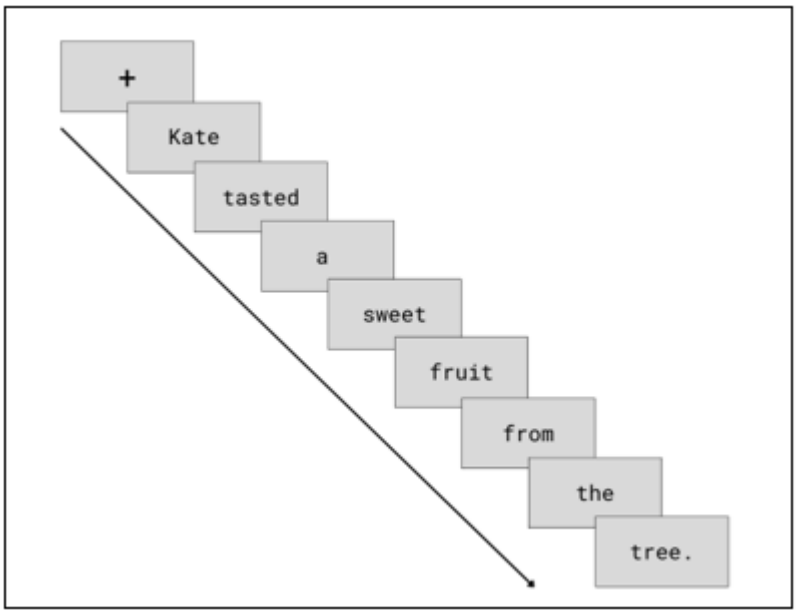
[15] WESTERN UNIVERSITY. **Dr. Stuart Webb, PhD. Resources for teaching, learning, and researching vocabulary.** Available at: https://www.edu.uwo.ca/about/faculty-profiles/stuart-webb/index.html. Accessed on: 28 Feb. 2025.

this task (Webb; Sasao; Balance, 2017). The criterion to determine the English knowledge of participants, at the 1000-word frequency level, followed the same criterion used by Schmitt, Schmitt and Clapham (2001), which required between 26 and 30 points.

3.4.3 The self-paced reading task

The main task to investigate lexical access in English was the self-paced reading task. The self-paced reading task allowed the investigation of language comprehension processes, specifically the access of lexicon (McDonough; Trofimovich, 2012). The segments of the sentence were exhibited in a centred format with word-by-word segmentation and noncumulative display to reach a more precise reading time in milliseconds (ms). The word-by-word segmentation is significant to infer the processing of the segment area, which sets cognates to be read and analysed (Jegerski, 2013). Figure 8 demonstrates an example of a sentence presentation in a noncumulative centred format with word-by-word segmentation of this study:

Figure 8 – Example of a sentence presentation



Source: Elaborated by the author.

Following the instructions of Jegerski (2013), the experimental sentences were predetermined and divided into regions of interest. First, a cue + symbol was displayed for one second on a computer screen to direct the gaze of participants. Participants performed the self-paced reading task while seated in front of a computer. The sentences were displayed

throughout the segments of a sentence. Participants controlled the segments by pressing the space bar on the keyboard, whilst they recognised the segments (Jegerski, 2013; Oliveira; Marcilese; Leitão, 2022). The time taken by participants to press the space bar from one word to the next was recorded in milliseconds (ms). The intent was that the time expressed during the recognition of the segments was the time that participants processed them (McDonough; Trofimovich, 2012). This idea considered the eye-mind-assumption proposed by Just and Carpenter (1980) in their theory of reading, in which both eyes and mind seem to be unified by the fixation on a word during its processing. Moreover, the self-paced reading task is considered an efficient and reliable task in real life, as the task is an online method that measures participants' performance whilst also measuring linguistic processing (Mitchell; Green, 1978; Oliveira; Marcilese; Leitão, 2022). I will describe the experimental design and stimuli for the self-paced reading task in the next subsection.

3.4.3.1 The experimental design

The design matrix of this study was composed of 96 experimental trials (see Appendix C for all trials). The segment area to be analysed was distributed into three experimental conditions (see Appendix D for all words): (1) 16 pairs of double cognate words between Spanish and English in the Experimental Condition 1 (EC1); (2) 16 pairs of double cognate words between Brazilian Portuguese and English in the Experimental Condition 2 (EC2); (3) 16 triple cognate words among Spanish, Brazilian Portuguese and English in the Experimental Condition 3 (EC3). Non-cognate words were the control condition. Thus, there were Control Condition 1 (CC1), Control Condition 2 (CC2) and Control Condition 3 (CC3). The independent variable was the cognate status (double cognate; triple cognate; non-cognate), whereas the dependent variable was the reading speed measured (milliseconds of time on screen).

I split the 96 trials into 16 blocks. A block consisted of six trials: three experimental sentences and three control sentences in each block. There was an EC1, an EC2, an EC3, a CC1, a CC2 and a CC3 in each block. All the Experimental Conditions (ECs) and Control Conditions (CCs) were counterbalanced in a fixed order of the Latin Square 4X4. Table 9 shows how the stimulus conditions of this study were counterbalanced:

Table 9 – Counterbalancing stimuli conditions

BLOCK 1	EC1	CC3	EC2	CC1	EC3	CC2
BLOCK 2	CC2	EC1	CC3	EC2	CC1	EC3
BLOCK 3	EC3	CC2	EC1	CC3	EC2	CC1
BLOCK 4	CC1	EC3	CC2	EC1	CC3	EC2
BLOCK 5	EC2	CC1	EC3	CC2	EC1	CC3
BLOCK 6	CC3	EC2	CC1	EC3	CC2	EC1
BLOCK 7	EC1	CC3	EC2	CC1	EC3	CC2
BLOCK 8	CC2	EC1	CC3	EC2	CC1	EC3
BLOCK 9	EC3	CC2	EC1	CC3	EC2	CC1
BLOCK 10	CC1	EC3	CC2	EC1	CC3	EC2
BLOCK 11	EC2	CC1	EC3	CC2	EC1	CC3
BLOCK 12	CC3	EC2	CC1	EC3	CC2	EC1
BLOCK 13	EC1	CC3	EC2	CC1	EC3	CC2
BLOCK 14	CC2	EC1	CC3	EC2	CC1	EC3
BLOCK 15	EC3	CC2	EC1	CC3	EC2	CC1
BLOCK 16	CC1	EC3	CC2	EC1	CC3	EC2

Source: Elaborated by the author.

In addition, fillers and comprehension questions were included in the design matrix. Fillers and comprehension questions were not always fixed in the same position in the blocks. I used them to keep the experimental and control conditions separate. It was a challenge to choose the filler sentences to include in this study, as the fillers could not contain any double or triple cognate words, which were the conditions of this study. There were 32 filler sentences in the design, two filler sentences in each block. The filler sentences were selected from three earlier studies conducted at LabLing: one sentence from the study of Wisintainer and Mota (2025); 14 sentences from the study of Toassi, Mota and Teixeira (2020); 10 sentences from the study of Bandeira-Haag (2015). Additionally, I selected seven sentences from the book Essential Grammar in Use (Murphy, 2010) to include as fillers. The filler sentences were presented in the active voice in the present tense, simple past tense (regular and irregular verbs), present perfect tense and first conditional in the future (see Appendix E for all sentences).

There were 24 comprehension questions to confirm participants focused on the task (Jegerski, 2013; Oliveira; Marcilese; Leitão, 2022). The comprehension questions followed most of the experimental and control sentences; only one comprehension question followed a filler sentence, and it was from Toassi (2020). I created the 23 questions using the simple past tense and the past tense of to be (see Appendix F for all questions). Participants answered the questions by pressing Y (for yes) or N (for no) on the keyboard, allowing accuracy to be recorded. The 24 comprehension questions were split into blocks, with one question in each block, two questions following the next block, and so on. I will illustrate an example containing a sentence in the EC3, followed by a categorical comprehension question in Figure 9:

Figure 9 – Example of a sentence in the EC3 followed by a comprehension question

Sentence in the EC3:

Kate tasted a sweet fruit from the tree in my backyard.

Comprehension question:

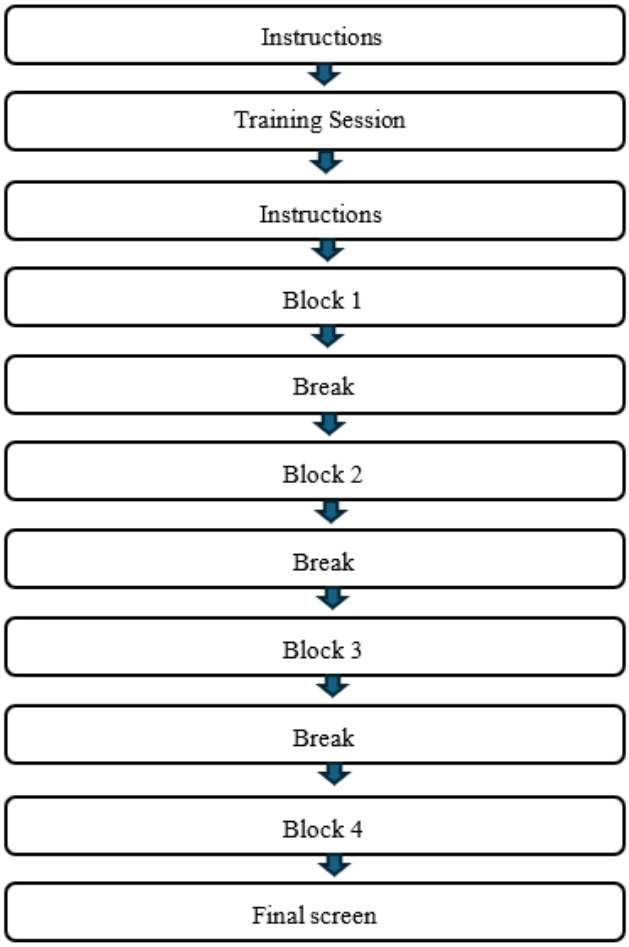
Did Kate taste a sour fruit from the tree?

Yes (y) No (n)

Source: Elaborated by the author.

Following this organisation, stimuli were divided over four lists of a 4X4 Latin Square to present stimuli in a fixed order and to avoid an order effect. Each letter of the Latin Square corresponded to a group of four blocks among the 16 blocks. The segments were presented in black font Roboto Mono, font size 0.07 and on a light gray background. The only keys available on the keyboard were Y, N and the spacebar (Appendix G). Figure 10 illustrates the design of the self-paced reading task:

Figure 10 – Flow chart of the self-paced reading task



Source: elaborated by the author.

Following the instructions in Brazilian Portuguese (see messages in Appendix H), participants practised a block composed of five practice trials (four sentences and one comprehension question) to get to know the experiment. The experiment repeated the instructions in English before the task began. There were three breaks during the experiment, one break after every four blocks (see messages in Appendix H). There was a final message thanking the participants and communicating that the task had ended (see messages in Appendix H). The four lists of the self-paced reading task were programmed in Psychopy (Peirce, 2007; Sampaio, 2017; Peirce *et al*., 2019; Peirce; Hirst; Macaskill, 2022). Participants performed only one of the four lists of a Latin Square. The reaction time allowed me to compare each EC with its CC to observe if ECs were processed faster or slower than CCs. There was no time limit for responses. Having discussed the experimental design, I will describe the selection of the experimental and control stimuli.

3.4.3.2 The selection of experimental and control stimuli

Whilst searching for stimuli, I have not found, to the best of my knowledge, any study that includes cognate and non-cognate words in the language combination among Spanish, Brazilian Portuguese and English. For this reason, I researched various resources to select cognate and non-cognate words in accordance with the conditions of this study. The criteria to select cognate and non-cognate words were orthography, semantics, length, word class and frequency. The selection and creation of stimuli occurred during the months of April, May, June, July and August of 2025 and embraced the phases and tasks as shown in Table 10:

Table 10 – Phases and tasks of stimuli

Phases	Tasks
Phase 1	Selection of double cognate words between Spanish and English, double cognate words between Brazilian Portuguese and English, triple cognate words and non-cognate words among Spanish, Brazilian Portuguese and English.
Phase 2	Control of word class and semantics.
Phase 3	Selection of the words from the EC1, EC2, EC3, CC1, CC2 and CC3.
Phase 4	Control of the degree of orthographic similarity.
Phase 5	Control of frequency.
Phase 6	Creation of the sentences.
Phase 7	Submission of the sentences to an acceptability judgement test by a native speaker of English.

Source: Elaborated by the author.

At phase 1, I pre-selected 27 empirical studies while reading the review of literature on lexical access, cognate words, and crosslinguistic influence involving the language combination of Spanish, Brazilian Portuguese, and/or English. From the 27 empirical studies, I selected 12 because the stimuli were shared in those studies (see Appendix I). Throughout the selection of stimuli, Dr. Pâmela Toassi, from the University of Brasília, kindly shared her full list of stimulus materials. Additionally, I selected eight studies from the Open Science Framework (OSF) website (see Appendix J) that shared stimuli in Spanish, Brazilian Portuguese, and/or English. In total, 20 empirical studies were selected. Moreover, I included two databases to select stimuli: the Cognet database (Batsuren; Bella; Giunchiglia, 2019; Batsuren; Bella; Giunchiglia, 2022) and the Phor-in-One database (Costa.; Comesaña; Soares, 2023). The last resource consulted for cognate words was the NTC's Dictionary of Spanish Cognates (Nash, 1997). Thus, I selected words to create a corpus-like set among Spanish, Brazilian Portuguese and/or English.

In total, I analysed 44.900 words. From the 44.900 words I selected 473 words (362 triple cognate words among Spanish, Brazilian Portuguese and English; 20 double cognate words between Spanish and English; 31 double cognate words between Brazilian Portuguese and English; 60 non-cognate words among Spanish, Brazilian Portuguese and English). In this phase, the criteria for selecting cognate and non-cognate words were orthography and semantics. To select the 473 words in phase 1, I used the Google Translate dictionary[16] to control for orthographic and semantic features. The selection of stimuli was challenging, since EC1 could not be cognate with EC2, and CC1, CC2, and CC3 could not be cognate among Spanish, Brazilian Portuguese, and English. Throughout the research, I found that 85% of Portuguese vocabulary, whether Brazilian or European Portuguese, contains cognates in Spanish (Ulsh, 1971). Hence, the similarity between Spanish and Brazilian Portuguese limited (Richman, 1965; Henriques, 2000) to control the stimuli used in this study.

At phase 2, I confirmed the word classes of the words in the Babla dictionary[17] and reinforced the control of the meaning of the words. Semantic control occurred through three dictionaries: Google Translate (for the second time), Collins[18] and Babla. Having verified the dictionaries, I deleted one word from the non-cognate words as it was a triple cognate word, one word from the triple cognate words as it was a false cognate in Spanish and three words

[16] GOOGLE. **Google Translate.** Available at: https://translate.google.com/?sl=auto&tl=pt&op=translate. Accessed on: 15 Apr. 2025.
[17] BAB.LA. **Online dictionaries.** Available at: https://en.bab.la/. Accessed on: 15 Apr. 2025.
[18] COLLINS. **Translator.** Available at: https://www.collinsdictionary.com/us/translator. Accessed on: 15 Apr. 2025.

from the Spanish – English double cognate words as it was a triple cognate word or presented two words in the Brazilian Portuguese translation. I checked the 31 double cognate words between Brazilian Portuguese and English in the Brazilian Portuguese monolingual dictionary *Vocabulário Ortográfico da Língua Portuguesa* (VOLP)[19] and I confirmed that seven words were foreign words. These words were checked in the Spanish monolingual dictionary of the *Real Academia Española* (RAE)[20] and were not confirmed to be foreign words in the RAE. Therefore, 11 words were deleted from the double cognate words between Brazilian Portuguese and English as they were false cognates in Spanish, were triple cognate words, or presented two words in the Spanish translation. Following the semantic control, there were 361 triple cognate words among Spanish, Brazilian Portuguese and English, 17 double cognate words between Spanish and English, 20 double cognate words between Brazilian Portuguese and English and 59 non-cognate words among Spanish, Brazilian Portuguese and English.

At phase 3, I selected from this group of words (1) 16 pairs of double cognate words between Spanish and English in EC1; (2) 16 pairs of double cognate words between Brazilian Portuguese and English in EC2; 16 triple cognate words among Spanish, Brazilian Portuguese and English in EC3. For each cognate word, there was a non-cognate word (CC) among Spanish, Brazilian Portuguese and English with the same length (see Appendix D). The criteria for selecting cognate and non-cognate words were orthography, semantics, length, and word class. In total, there were 91 words: 48 words in EC and 43 in CC. I repeated 5 words in CC (pumpkin, earthworm, bathrobe, guff, and pomegranate) to match the length between EC and CC. Table 11 shows an example of each EC and CC:

Table 11 – Experimental and control conditions

EC1	Sesame
CC1	Peanut
EC2	Funnel
CC2	Window
EC3	Actor
CC3	Mayor

Source: Elaborated by the author.

I confirmed that all cognate and non-cognate words of this study were nouns. However, there was only one adjective in EC1 (see Appendix D). Although EC and CC presented the

[19] ACADEMIA BRASILEIRA DE LETRAS. **Busca no vocabulário**. Rio de Janeiro. Available at: https://www.academia.org.br/nossa-lingua/busca-no-vocabulario. Accessed on: 20 Apr. 2025.
[20] REAL ACADEMIA ESPAÑOLA. **Diccionario de la lengua española.** Available at: https://dle.rae.es/. Accessed on: 20 Apr. 2025.

same length, it was not possible to present the same length for all pairs of EC and CC in this study. Table 12 summarises the word length range of pairs of cognate and non-cognate words:

Table 12 – Word length of pairs of cognate and non-cognate words

	Word length	Mean	SD
EC1 and CC1	3 to 11 letters	6.63	2.13
EC2 and CC2	3 to 11 letters	6.75	2.38
EC3 and CC3	3 to 7 letters	4.81	1.11
Total	3 to 11 letters	6.06	2.11

Source: Elaborated by the author.

At phase 4, I controlled the degree of orthographic similarity using an objective continuous measure. I calculated the orthographic similarity according to the Normalised Levenshtein Distance – NLD (Levenshtein, 1966) to quantify the similarity of word pairs continuously and to determine what this study means by a word as a cognate and as a non-cognate (Roembke; Koch; Philipp, 2024). The script was developed in Python[21] (versão 3.13.3, 64-bit) using the Levenshtein library[22] to compute the normalised distance between pairs of words extracted from an Excel spreadsheet. The NLD was calculated as (1- (D (w1, w2)/max (|w1|, |w2|))), where 1 is subtracted from the Levenshtein Distance (D) between word 1 and word 2 – accounting for insertions, deletions, or substitutions of characters – divided by the maximum length of the words compared. Following the NLD, the similarity values for word pairs ranged from 0 (no overlap) to 1 (total overlap).

The minimum cut-off in orthographic similarity for cognate words was 0.50 in the EC1, EC2 and EC3 with only few word pairs close to the cut-off boundaries and the maximum cut-off was 0.40 for parallel non-cognate words in the EC1 and EC2 and for non-cognate words in the CC1, CC2 and CC3 with only few word pairs close to the cut-off boundaries (see the NLD orthographic similarity in Appendix K). Table 13 summarises the mean and the median orthographic similarity, determines the similarity range, identifies the first letter of word pairs and presents a stimulus example in each condition of this study:

[21] PYTHON SOFTWARE FOUNDATION. **Python. 2001-2025**. Available at: https://www.python.org/. Accessed on: 30 June. 2025.
[22] PYTHON-LEVENSHTEIN. **Levenshtein**. Available at: https://www.python.org/. Accessed on: 30 June. 2025.

Table 13 – Control of the degree of orthographic similarity

		Mean	SD	Median	Similarity range	First identical letter	Stimulus example
EC1 and CC1	**COG**	0.60	0.18	0.57	0.27 – 1	100%	sesame/sésamo (EN/SP) NLD = 0.83
	Parallel NC	0.19 (EN/BP)	0.13 (EN/BP)	0.22 (EN/BP)	0 – 0.38 (EN/BP)	12,5% (EN/BP)	sesame/gergelim (EN/BP) NLD = 0.13
		0.22 (SP/BP)	0.15 (SP/BP)	0.20 (SP/BP)	0 – 0.50 (SP/BP)	12,5% (SP/BP)	sésamo/gergelim (SP/BP) NLD = 0.13
	NC	0.16 (EN/BP)	0.11 (EN/BP)	0.15 (EN/BP)	0 – 0.40 (EN/BP)	12,5% (EN/BP)	peanut/amendoim (EN/BP) NLD = 0.13
		0.13 (EN/SP)	0.17 (EN/SP)	0.06 (EN/SP)	0 – 0.45 (EN/SP)	6,25% (EN/SP)	peanut/cacahuete (EN/SP) NLD = 0.33
		0.17 (BP/SP)	0.15 (BP/SP)	0.17 (BP/SP)	0 – 0.40 (BP/SP)	6,25% (BP/SP)	amendoim/cacahuete (BP/SP) NLD = 0.11
EC2 and CC2	**COG**	0.71	0.21	0.67	0.30 – 1	94%	funnel/funil (EN/BP) NLD = 0.67
	Parallel NC	0.17 (EN/SP)	0.12 (EN/SP)	0.18 (EN/SP)	0 – 0.40 (EN/SP)	6,25% (EN/SP)	funnel/embudo (EN/SP) NLD =0
		0.15 (BP/SP)	0.12 (BP/SP)	0.15 (BP/SP)	0 – 0.40 (BP/SP)	6,25% (BP/SP)	funil/embudo (BP/SP) NLD =0
	NC	0.13 (EN/BP)	0.11 (EN/BP)	0.13 (EN/BP)	0 – 0.38 (EN/BP)	n.a. (EN/BP)	window/janela (EN/BP) NLD = 0.17
		0.11 (EN/SP)	0.12 (EN/SP)	0.11 (EN/SP)	0 – 0.45 (EN/SP)	n.a. (EN/SP)	window/ventana (EN/SP) NLD = 0.14
		0.18 (BP/SP)	0.17 (BP/SP)	0.13 (BP/SP)	0 – 0.50 (BP/SP)	6,25% (BP/SP)	janela/ventana (BP/SP) NLD = 0.29
EC3 and CC3	**COG**	0.85 (EN/BP)	0.13 (EN/BP)	0.80 (EN/BP)	0.60 – 1 (EN/BP)	100%	actor/ator (EN/BP) NLD = 0.80
		0.85 (EN/SP)	0.14 (EN/SP)	0.82 (EN/SP)	0.60 – 1 (EN/SP)		actor/actor (EN/SP) NLD = 1
		0.96 (BP/SP)	0.08 (BP/SP)	1 (BP/SP)	0.80 – 1 (BP/SP)		ator/actor (BP/SP) NLD = 0.80
	NC	0.14 (EN/BP)	0.14 (EN/BP)	0.13 (EN/BP)	0 – 0.50 (EN/BP)	12,5% (EN/BP)	mayor/prefeito (EN/BP) NLD = 0
		0.20 (EN/SP)	0.17 (EN/SP)	0.17 (EN/SP)	0 – 0.50 (EN/SP)	12,5% (EN/SP)	mayor/alcalde (EN/SP) NLD = 0.14
		0.22 (BP/SP)	0.15 (BP/SP)	0.21 (BP/SP)	0 – 0.50 (BP/SP)	31,5% (BP/SP)	prefeito/alcalde (BP/SP) NLD = 0

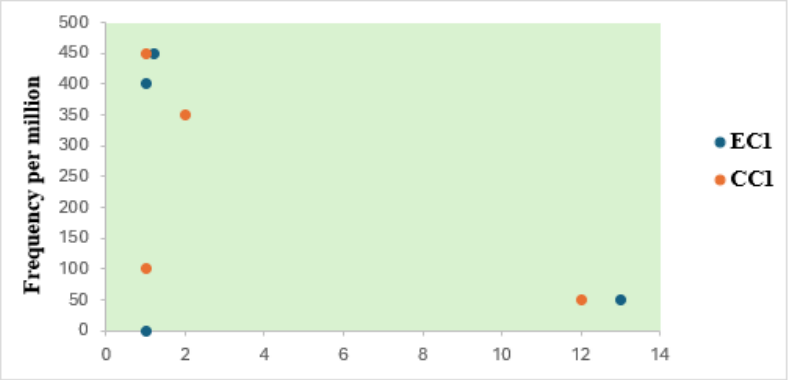
Note: There were three cognate pairs below 0.50 in EC1, one cognate pair below 0.50 in EC2 and two non-cognate pairs above 0.40 in EC1. There were two non-cognate pairs above 0.40 in CC1, three non-cognate pairs above 0.40 in CC2 and 6 non-cognate pairs above 0.40 in CC3. N.a.=not applicable. EN=English; BP=Brazilian Portuguese; SP=Spanish.

Source: Elaborated by the author.

At phase 5, I established a frequency range for English, Brazilian Portuguese, and Spanish words (Peters, 2020; Dang; Webb; Coxhead, 2022; Urdaniz; Skoufaki, 2022; Dang; Macis; Munizaga, 2025). I checked the frequency of English words in The Corpus of Contemporary American English – COCA (Davies, 2008), the frequency of Spanish words in the *El Corpus Del Español* (Davies, 2016a) and the frequency of Brazilian Portuguese words

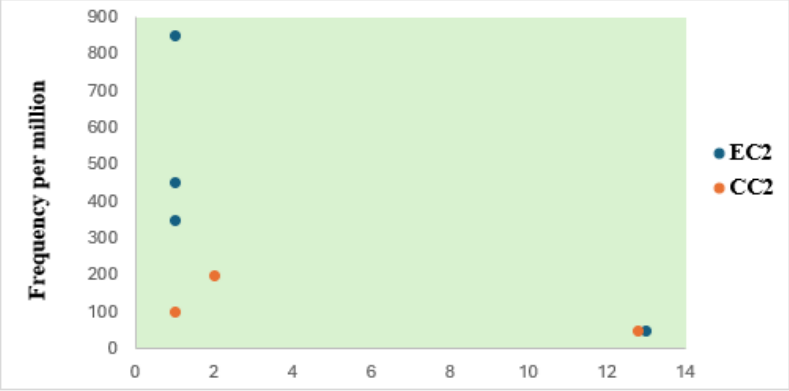
in the *Corpus do Português* (Davies, 2016b). Experimental and control words went through a frequency check, aiming to verify whether the frequency would or would not affect the cognate effect and how homogeneous the frequency words were (see Appendix L for the full list of frequencies). The scatter plots summarise the frequency range in EC1 and CC1, EC2 and CC2, EC3 and CC3:

Figure 11 – Frequency Range in EC1 and CC1



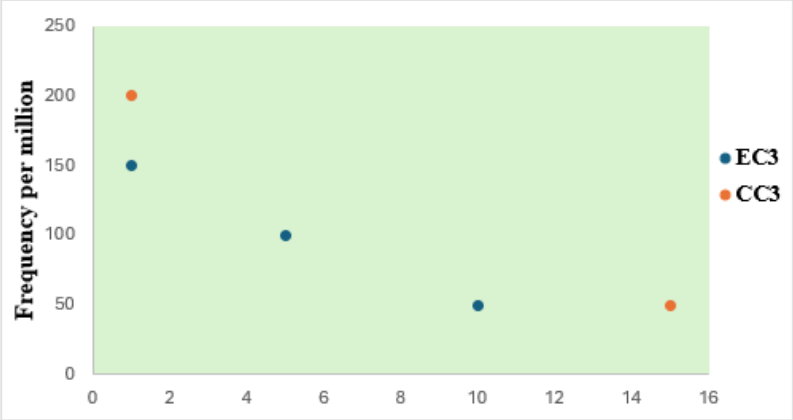
Source: Elaborated by the author.

Figure 12 – Frequency Range in EC2 and CC2



Source: Elaborated by the author.

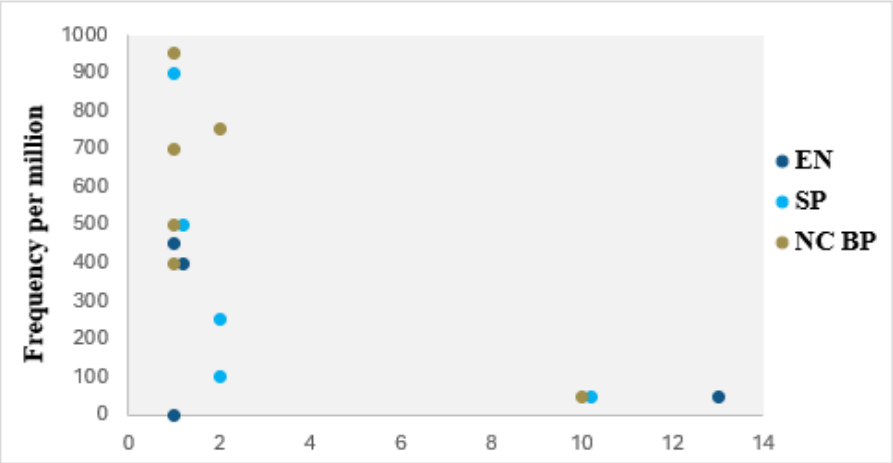
Figure 13 – Frequency Range in EC3 and CC3



Source: Elaborated by the author.

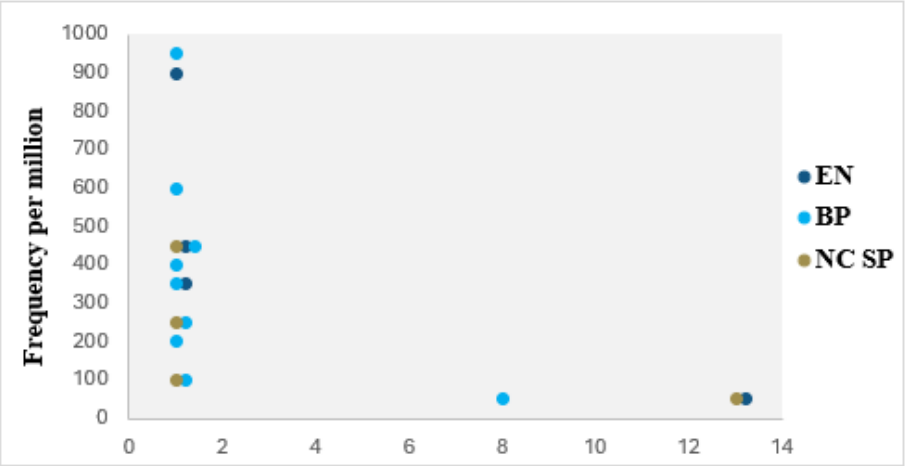
Additionally, I will demonstrate the frequency range of cognate words and non-cognate words in parallel in each condition:

Figure 14 – Frequency Range in EC1



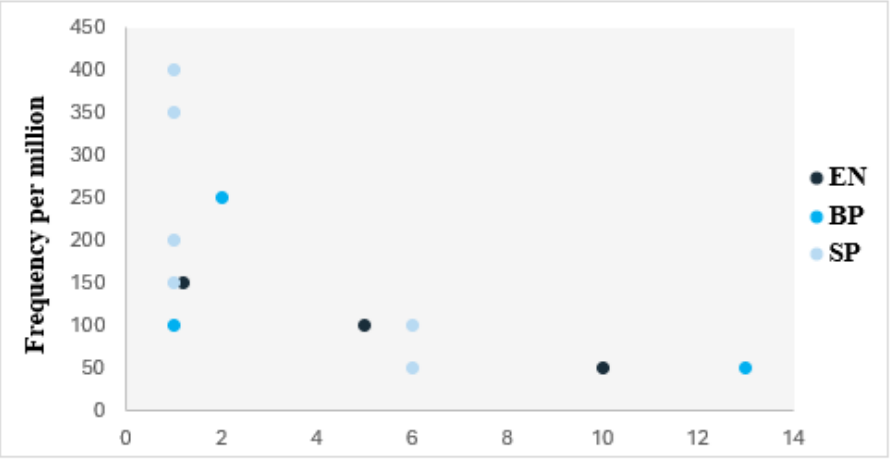
Source: Elaborated by the author.

Figure 15 – Frequency Range in EC2



Source: Elaborated by the author.

Figure 16 – Frequency Range in EC3



Source: Elaborated by the author.

At phase 6, I created the sentences of this study using three tools that simulate intelligent human behaviour. The tools that I used were Gemini[23], ESL Tree[24] and ChatGPT[25]. I entered the prompt "Write two identical beginner-level English sentences in the past for the self-paced reading task. The sentences need to have between 7 and 14 words, and the fifth word must be (cognate word) in one sentence and (non-cognate word) in the other sentence". The three tools presented a lack of understanding as the tools did not write identical sentences, presented two sentences with different word numbers, placed cognate and non-cognate words in different positions, wrote sentences out of context and produced semantically nonsensical sentences. When the lack of understanding occurred, I asked the tools if the sentence made sense, and the answer was no. So, every lack of understanding I asked the tool to rewrite until I had similar sentences.

The sentences consisted of 96 sentences in English (see Appendix C for all sentences): 48 experimental and 48 control. Sentences were written in the active voice in the simple past tense (regular and irregular verbs). Sentences were presented from 7 to 14 segments (M = 8.79; SD = 0.99) and the area analysed contained double or triple cognate words in EC and non-cognate words in CC. I will illustrate an example containing an EC3 and a CC3 in Figure 17:

Figure 17 – Example of sentences containing an EC and CC

Example:

Alan saw the actor at the market with his dog.

Alan saw the mayor at the market with his dog.

Source: Elaborated by the author.

EC and CC were always shown in the same position in both sentences. Most of the trials exhibited the same number of segments between each EC and CC. However, there were two trials in which the number of segments differed between EC2 and CC2. Target words were always the fourth or fifth segment in the sentences. However, there was one pair of EC1 and CC1 that presented target words in the third segment in the sentences and one pair of EC2 and CC2 that presented target words in the seventh segment in the sentences. I will summarise the segment order of target words in Table 14:

[23] GEMINI. Available at: https://gemini.google.com. Accessed on: 01 June. 2025.
[24] ESL TREE. **Simple ESL Text Generator**. Available at: https://esl-tree.com/simple-esl-text-generator/. Accessed on: 01 June. 2025.
[25] CHAT GPT. Available at: https://chatgpt.com/. Accessed on: 01 June. 2025.

Table 14 – Segment order of target words

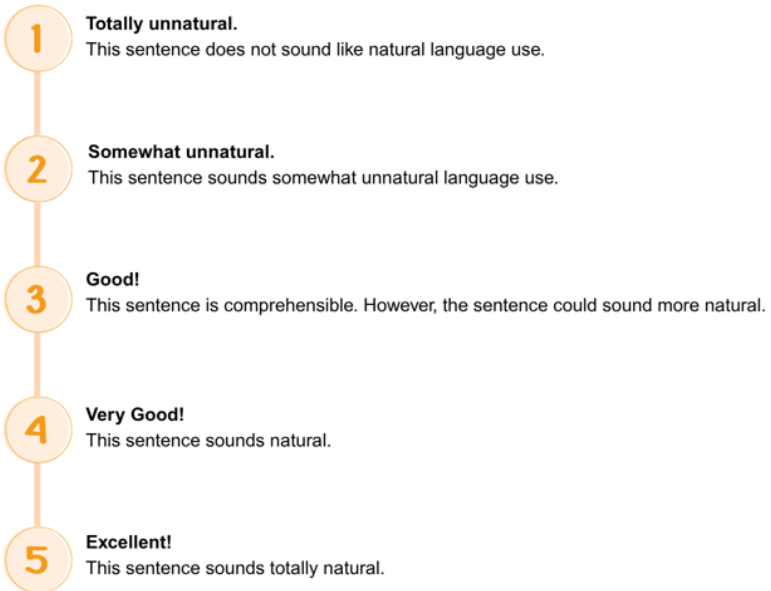
	Segment order			
	3rd Segment	**4th Segment**	**5th Segment**	**7th Segment**
EC1 and CC1	1	14	1	0
EC2 and CC2	0	9	6	1
EC3 and CC3	0	12	4	0
Percentage	2%	73%	23%	2%

Source: Elaborated by the author.

Due to the lack of understanding of the tools that simulate intelligent human behaviour in presenting the target words in the fifth word order in the sentences, this study followed the criteria to have a minimum of 3 words before and after the target words (cognate or non-cognate), the same criteria established as in the study of Toassi, Mota and Teixeira (2020).

At phase 7, I submitted the experimental sentences in English to an acceptability judgement test by native speakers of English to verify whether the sentences were natural or not. I sent an invitation (Appendix M) via e-mail (Appendix M) to advertise the invitation to English native speakers to participate in the selection of linguistic stimuli for a remote test. Following the instructions in the invitation, participants read the *Termo de Consentimento Livre e Esclarecido* – TCLE (Appendix N) in English to decide whether they agreed or not to participate in the test. The test consisted of a Likert scale adapted from De Angeli and Mota (2023) and Wisintainer and Mota (2025), in which participants evaluated whether sentences were natural or not on a scale from zero to five. The likert scale of this study is shown in Figure 18:

Figure 18 – Likert Scale



Source: Elaborated by the author.

One native speaker of English accepted to participate in this test on the 16th of August of 2025. Participant declared to be 38 years old and declared an undergraduate as their level of education. As sentences were rated on a 3 to 5-point scale, all sentences were included in the test. The results of the acceptability judgement test are summarised in Table 15:

Table 15 – Percentage of the acceptability judgement test

Point Scale	Percentage
1	–
2	–
3	13%
4	28%
5	59%

Source: Elaborated by the author.

3.4.4 The meaning recognition task

This task was performed right after the self-paced reading task. The purpose of this task was to confirm whether participants recognised or not the meaning of the target words in the self-paced reading task. The meaning recognition task was presented in a hard copy. This task presented 91 target words in English from the self-paced reading task. For every word in English, there were four words in Brazilian Portuguese and only one of the four was correctly translated. Participants chose one of the four words translated into Brazilian Portuguese. For a complete overview of the meaning recognition task, see Appendix O.

3.5 THE ETHICAL PROCEDURES

The present study was approved by the *Comitê de Ética em Pesquisa com Seres Humanos* (CEPSH) from the *Universidade Federal de Santa Catarina* (UFSC) under CAAE 87651825.7.0000.0121.

3.6 THE OPEN SCIENCE PRACTICES

This study was preregistered at the Open Science Framework website on 12th of August of 2025. The preregistration for this study is available on OSF at DOI: 10.17605/OSF.IO/DMXP5.

3.7 THE PRE-PILOT AND THE PILOT STUDY

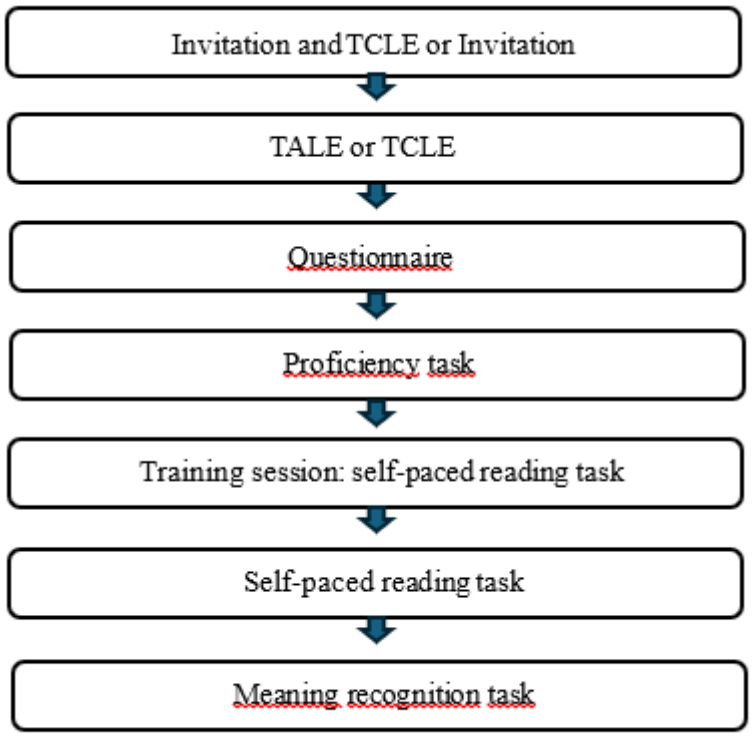
Following preregistration on the Open Science Framework website, a pre-pilot study was conducted at LabLing to test the instruments, control for time, and control for the effect of stimulus segmentation (Jegerski, 2013). The pre-pilot study included 3 participants (2 female, Mage = 28, SD = 2.65). Participants spent from 60 to 90 minutes (M = 70, SD = 17.32) to complete the tasks in this study. Following the feedback of participants, I reviewed task 3 and task 4 to conduct the pilot study.

The pilot study was conducted in schools to test the instruments, to control for time and to control for the effect of stimulus segmentation (Jegerski, 2013) with the population of this study. The pilot study included 2 participants (1 female, Mage = 17, SD = 0). Participants spent from 80 to 85 minutes (M = 82.50, SD = 3.54) to complete the tasks in this study. At this time, changes were not necessary. Overall, the pilot study provided evidence that the instruments were applicable to the population of this study.

3.8 DATA COLLECTION PROCEDURES

Data collection occurred from September to October of 2025 at seven different public schools in Florianópolis, located in the Grande Florianópolis region, in SC, Brazil (Appendix A). Data collection sessions were in person and occurred in unoccupied available rooms at the schools where participants studied. This included the library, free classrooms or any room available on the day. The data collection session lasted from 70 to 180 minutes (M = 108.36, SD = 23.66) and participants performed four tasks individually. Data collection procedures are summarised in Figure 19:

Figure 19 – Flow chart of data collection procedures



Source: elaborated by the author.

As shown above, data collection procedures presented seven stages. At stage 1, participants received an invitation (Appendix P) attached to the *Termo de Consentimento Livre e Esclarecido* – TCLE for the parental figure (for example mother, stepmother, father, stepfather or person responsible for the participant) for those participants who were 17 or younger than 17 years old. TCLE was presented in Spanish and Brazilian Portuguese versions (Appendices Q and R) Participants who were 18 or older than 18 years old, received an invitation (Appendix P).

At stage 2, I invited to participate in the session of the experiment those participants who were 17 or younger than 17 years old who had the TCLE read, signed and authorised by a parental figure and those participants who were 18 or older than 18 years old who demonstrated they wanted to participate. Participants who were 17 or younger than 17 years old received the *Termo de Assentimento Livre e Esclarecido* – TALE (Appendices S and T) to read, to decide whether they wanted or not to participate and to sign. Participants who were 18 or older than 18 years received the TCLE (Appendices U and V) designed for their age to read, to decide whether they wanted to participate or not, and to sign. Both documents, TCLE and TALE, were presented in Spanish and Brazilian Portuguese versions.

At stage 3, participants received instructions to answer a biographical and language background questionnaire, which is task 1 of this study. Participants answered the questionnaire in Brazilian Portuguese or Spanish versions and took an average of 33.70 minutes (SD = 9.67) to complete this task. At stage 4, participants performed a proficiency task in English, which is task 2 of this study. Participants took an average of 6.85 minutes (SD = 2.75) to complete the proficiency task in English. At stage 5, participants received instructions for a self-paced reading training session to get to know the task, followed by the self-paced reading task at stage 6. Both stages 5 and 6 are part of task 3 of this study. Participants took an average of 31.18 minutes (SD = 10.87) to complete the self-paced reading task. At stage 7, participants performed the meaning recognition task right after the self-paced reading, which is task 4 of this study. Participants took an average of 11.09 minutes (SD = 4.69) to complete the meaning recognition task. Tasks 1, 2 and 4 were presented in a hard copy format and task 3 was presented on the researcher's personal laptop (LENOVO Ideapad S145-15 IWL, Intel Core i5-8265U, 1.60GHz). No internet access was required for task 3.

Most of the data collection sessions were conducted in a day. However, some data collection sessions were conducted in two or three days due to the conditions offered by the school. Those conducted in two or three days included tasks 1 and 2 in one or two days, and tasks 3 and 4 on the following day. Participants received an identification code (example P2025703) to preserve their identity and to guarantee anonymous participation in this study. I used a computer-generated random number[26] to select the participant numbers. Participants paused to rest or drink water during data collection at any time to avoid and minimise fatigue.

[26] RESEARCH RANDOMIZER. Available at: https://www.randomizer.org/. Accessed on: 15 Aug. 2025.

4 RESULTS

The main objective of the present study was to investigate CLI in lexical access in English in native speakers of Spanish as a first language, who are also speakers of Brazilian Portuguese as a second language and are learning English as a third language at school in Brazil. More specifically, I was interested in the cognate facilitation effect from triple cognate words (Spanish – Brazilian Portuguese – English) and double cognate words (Spanish – English or Brazilian Portuguese – English) compared to non-cognate words. Additionally, I was interested in finding out whether there were differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words. In this chapter, I will describe the data organisation in section 4.1, the analyses in section 4.2, followed by the descriptive data analyses in subsection 4.2.1 and the inferential data analyses in subsection 4.2.2. I will further present the general discussion in section 4.3 and readdress the research questions and hypotheses in section 4.4.

4.1 THE DATA ORGANISATION

I organised the data on an Excel spreadsheet and used participants' code to tabulate the results. I checked the accuracy of the comprehension questions and discarded the data from participants whose accuracy was below 50%. Out of 33 participants, seven participants did not meet the criterion of 50% of accuracy and their data were discarded. The resulting raw data consisted of 2496 observations from 26 participants. Reaction times (RTs) were exported from PsychoPy in seconds (s) and converted to milliseconds (ms). I manually checked the missing RT data for the critical words and I did not find any missing RTs. In addition, I removed the impossible values (365 observations) that were <100ms and >2.500ms (Marsden; Thompson; Plonsky, 2018). Then, I calculated the mean RTs for each participant and removed the outliers, which were lower or higher than 2.5 SDs (Beatty-Martínez *et al*., 2020) from the participant mean (38 observations). At this point, there were 2093 observations. Following the data trimming process, I analysed the data, which is described in the next section and subsections.

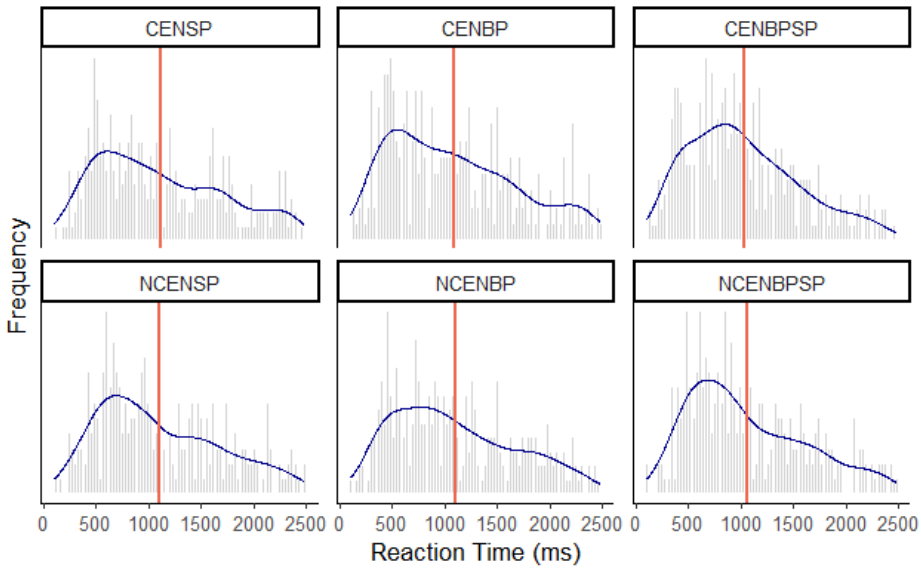
4.2 THE ANALYSES

The data was analysed in R (version 4.5.1; R Core Team, 2025) using the tidyverse (Wickham *et al*., 2019), ggplot (Wickham, 2015), lme4 (Bates *et al*., 2015), lmerTest (Kuznetsova, Brockhoff, Christensen, 2017), sjPlot (Lüdecke, 2021) and emmeans (Lenth, 2021) packages. For the purposes of this study, I fitted a multiple mixed-effects linear model according to the experimental design of this study to answer the hypotheses previously mentioned (Baayen; Davidson; Bates, 2008; Godoy; Nunes, 2020). Following these criteria, I decided that participants and words were random effects and conditions, familiarity, proficiency, word size and frequency were fixed effects. I will describe the descriptive data analyses of the fixed factors according to the sample of this study in the descriptive data analyses subsection and introduce the multiple mixed-effects linear model in the inferential data analyses subsection.

4.2.1 The descriptive data analyses

The descriptive data analyses include five fixed factors: the conditions, the familiarity of the target words, the English proficiency objective measure, the size of the target words and the frequency of the target words. The fixed factor conditions considered the experimental and control conditions of this study. Figure 20 demonstrates the data distribution for each condition of this study:

Figure 20 – Distribution of RT per condition:



Note: CENSP=English and Spanish double cognate words; NCENSP=English and Spanish non-cognate words; CENBP=English and Brazilian Portuguese double cognate words; NCENBP=English and Brazilian Portuguese non-cognate words; CENBPSP=English, Brazilian Portuguese and Spanish triple cognate words; NCENBPSP=English, Brazilian Portuguese and Spanish non-cognate words.

Source: Elaborated by the author.

The figure above shows the distributions of the experimental (above the figure) and control conditions (below the figure). All conditions are not normally distributed. The conditions CENSP, NCENSP, and CENBP demonstrate that the peak occurs before the mean (red line), indicating that a group of participants reacted faster than the mean across the conditions. Opposite to this direction, the peaks of the conditions NCENBP, CENBPSP and NCENBPSP are closer to the mean. The conditions NCENBP, CENBPSP, and NCENBPSP demonstrate a longer distribution toward the mean and less homogeneity in participants' fast RTs. The flattened peaks confirm lower homogeneity and a long RT distribution. Table 16 presents the descriptive statistics of the RTs per condition:

Table 16 – Descriptive statistics of the RTs (ms)

Condition	Mean	Median	SD	Range
CENSP	1117.25	1009.41	601.02	104.7 – 2458.07
NCENSP	1105.81	967.8	577.18	111.35 – 2478.51
CENBP	1083.02	992.56	601.02	129.7 – 2475.95
NCENBP	1098.78	997.14	576.33	117 – 2458.76
CENBPSP	1027.87	941.83	526.96	125.47 – 2462.18
NCENBPSP	1063.37	918.57	559.28	109.31 – 2479.03

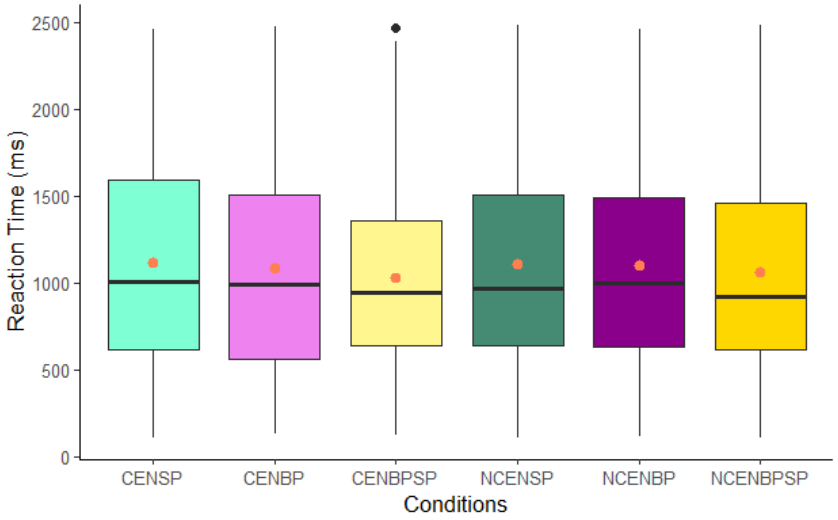
Note: SD=standard deviation.

Source: Elaborated by the author.

The mean RTs are similar across the conditions. The conditions, in ascending order according to the mean values, are English, Brazilian Portuguese and Spanish cognates (CENBPSP), followed by English, Brazilian Portuguese and Spanish non-cognates (NCENBPSP), then English and Brazilian Portuguese cognates (CENBP). Following the ascending order, the next conditions are English and Brazilian Portuguese non-cognates (NCENBP), followed by English and Spanish non-cognates (NCENSP), then English and Spanish cognates (CENSP). The lowest mean is observed in the condition among English, Brazilian Portuguese and Spanish cognates – CENBPSP (M=1027.87) and the highest in the condition between English and Spanish cognates – CENSP (M=1117.25). The conditions, in ascending order according to the SD values, are English, Brazilian Portuguese and Spanish cognates (CENBPSP), followed by English, Brazilian Portuguese and Spanish non-cognates (NCENBPSP), then English and Brazilian Portuguese non-cognates (NCENBP). Following the ascending order, the next conditions are English and Spanish non-cognates (NCENSP), followed by English and Brazilian Portuguese cognates (CENBP), then English and Spanish cognates (CENSP).

The lowest SD is observed in the condition among English, Brazilian Portuguese and Spanish cognates – CENBPSP (SD=526.96) and the highest SD in both English and Spanish cognates and English and Brazilian Portuguese cognates – CENSP and CENBP (SD=601.02). SD is equal in the conditions English and Spanish cognates – CENSP (SD=601.02) and English and Brazilian Portuguese cognates – CENBP (SD=601.02). In addition, SD is similar across English and Spanish non-cognates – NCENSP (SD=577.18) and English and Brazilian Portuguese non-cognates – NCENBP (SD=576.33). In other words, these values show the high variability of RTs in relation to the mean. Figure 21 presents a boxplot for the median and mean of conditions:

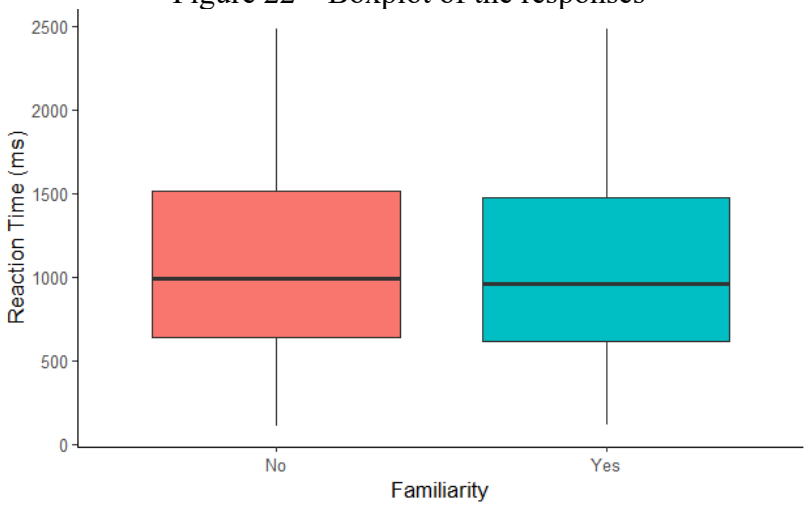
Figure 21 – Boxplot of the conditions



Source: Elaborated by the author.

The figure above shows that the medians are similar across the conditions. Although there are differences between the first and third quartiles across CENSP, CENBP, and CENBPSP, the median line is very similar across conditions, indicating similar values. Additionally, the orange dots display the means and show that the means are close to the median across conditions. This means that the skewness of RTs is not so strong. The second fixed factor is the word familiarity of the target words. Figure 22 illustrates the extent to which participants recognised the meaning of the target words, based on yes and no responses:

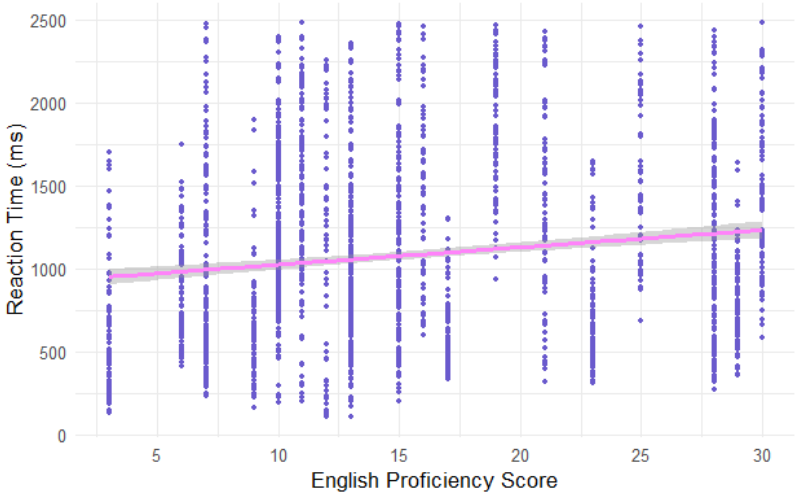
Figure 22 – Boxplot of the responses



Source: Elaborated by the author.

As demonstrated above, both median lines are similar and both boxplots present similar size, indicating that there is no difference between the answers when participants recognised (by answering yes) or did not recognise (by answering no) the meaning of the target words. The third fixed factor is the English proficiency objective measure. Figure 23 shows the scatter plot of the English proficiency:

Figure 23 – Scatter plot of the English proficiency

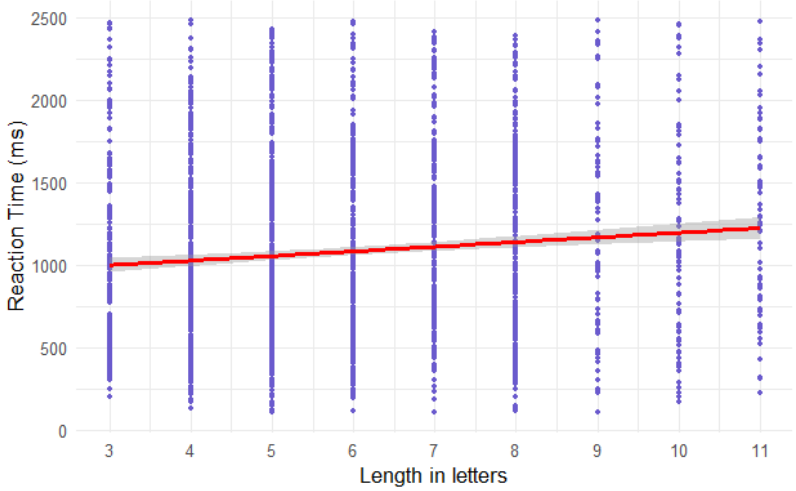


Source: Elaborated by the author.

As shown above, the trend line indicates the relationship between RT and English Proficiency Score. The score ranged from 0 to 30. The trend line shows that participants with high scores have slower RTs, whereas participants with low scores have faster RTs. This is opposite to what the literature discusses regarding the relationship between proficiency and RTs

(Lemhöfer, 2023; Englert; Venagli; Kupisch, 2025). The fourth fixed factor is word size measured in letters. Figure 24 shows a scatter plot of the length in letters:

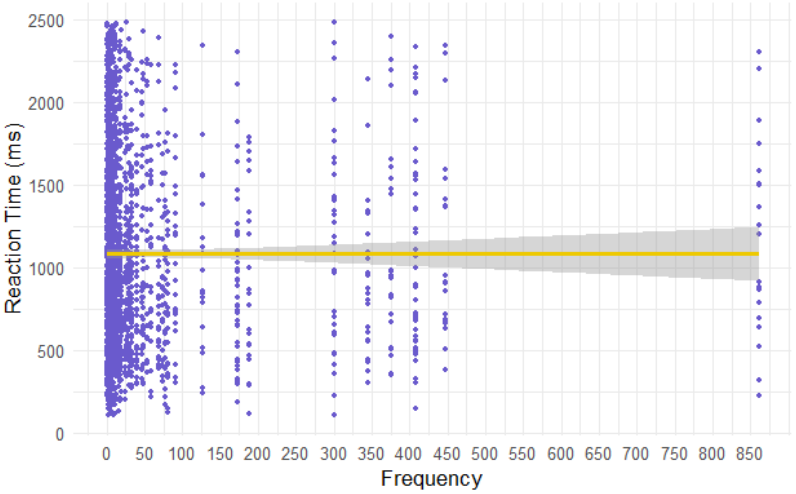
Figure 24 – Scatter plot of the length in letters



Source: Elaborated by the author.

The trend line indicates the relationship between RT and word size, measured by letter length. Word size ranged from 3 to 11 letters, and the trend line shows that longer words are associated with slower RTs. Additionally, Figure 25 reveals that the shorter the words, the faster the RTs. This is in accordance with the literature (Peters, 2020; Urdaniz; Skoufaki, 2022). The fifth fixed factor is the frequency per million of the target words. Figure 25 shows the scatter plot of frequency:

Figure 25 – Scatter plot of the frequency



Source: Elaborated by the author.

As demonstrated above, the trend line indicates the relationship between RTs and the frequency of the words. The trend line does not demonstrate any relationship. However, the shaded area confidence interval indicates that RTs can vary slightly up and down. In the next subsection, I will describe the inferential statistics.

4.2.2 The inferential data analyses

Since the data were not normally distributed, all RTs were log-transformed using the log() function in the inferential analyses. When transforming using the log() function, I found 17 infinite values, which I excluded to continue with the analyses, as this function does not accept infinite values. At this point, there were 2076 observations. The multiple mixed-effects linear model was fitted to estimate RTs across the fixed factors described previously. I observed the random and fixed effects, considering the random intercept and both intercept and slope as random (Baayen; Davidson; Bates, 2008; Godoy; Nunes, 2020). However, having both intercept and slope as random increased the complexity of the model and the model did not converge. Therefore, I decided to use only the intercept as random. The model had the following code: m=lmer(log_rt~cond+wFam+EnPTask+lengInLet+log_freqPM+(1|word)+(1|id), data=data2). The results of the model are summarised in Table 17:

Table 17 – Results of the model

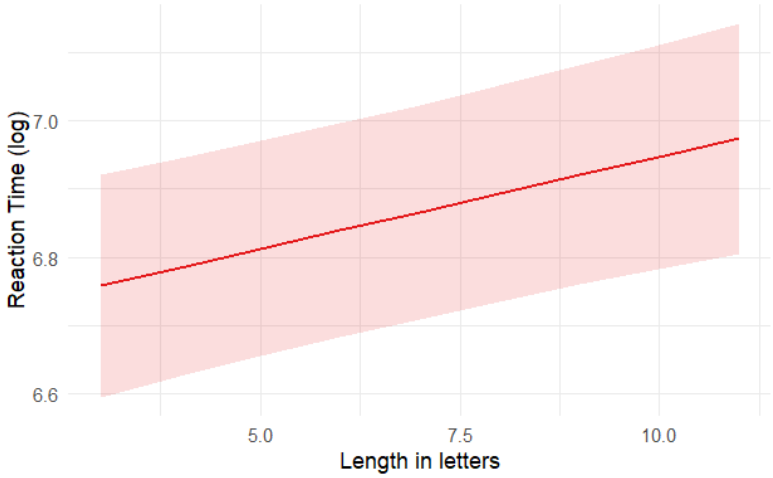
	RT(log)		
Predictors	Estimates	CI	p
(Intercept)	6.53	6.20 – 6.85	**<0.001**
cond [CENBP]	-0.06	-0.15 – 0.03	0.207
cond [CENBPSP]	-0.03	-0.12 – 0.06	0.548
cond [NCENSP]	0.00	-0.09 – 0.10	0.936
cond [NCENBP]	-0.01	-0.10 – 0.08	0.828
cond [NCENBPSP]	0.01	-0.08 – 0.10	0.855
wFam [1]	0.00	-0.05 – 0.05	0.992
EnPTask	0.01	-0.00 – 0.03	0.134
lengInLet	0.03	0.01 – 0.04	**<0.001**
log freqPM	-0.01	-0.03 – 0.01	0.293

Random Effects	
σ^2	0.22
$\tau_{00\ word}$	0.01
$\tau_{00\ id}$	0.12
ICC	0.35
$N_{\ word}$	90
$N_{\ id}$	26
Observations	2076
Marginal R^2 / Conditional R^2	0.041 / 0.380

Source: Elaborated by the author.

The model does not predict any significant effect across experimental (CENSP, CENBP and CENBPSP) and control conditions (NCENSP, NCENBP and NCENBPSP) considering the RTs of the sample of this study. Additionally, the model does not predict any significant effect across double and triple cognate words (CENSP or CENBP and CENBPSP), considering the RTs of the sample of this study**.** The model explains approximately 38% of the variability in RTs ($R^2 = 0.380$). The intercept is the theoretical reference of the model, which is the CENSP condition. The model estimates that RT for CENSP is 6.53 in the log scale (B_0= 6.53, [6.20 – 6.85], p= <0.001) for words that participants did not know, for a person who has an English proficiency score of 0, reacting to a word with 0 letters and word frequency 0. The remaining coefficients (estimates column) will increase (if +) or decrease (if -) RT according to the reference of the model for each level of each variable. For instance, for the CENBP condition, the model estimates that RT decreases -0.06 in the log scale (B_1= -0.06, [-0.15 – 0.03], p >0.05) and for CENBPSP decreases -0.03 in the log scale (B_1= -0.03, [-0.12 – 0.06], p >0.05) from the reference of the model. However, the p-value is not significant as RT is not sufficiently large to be considered significant. The model does not estimate significant effects for frequency, familiarity, or proficiency in English. The only variable that the model estimates a significant change in is the variable word size measured through length in letters, which estimates an increase of 0.03 in the log scale (B_1= 0.3, [0.01 – 0.04], p = <0.001). Figure 26 illustrates the significant effect of word size:

Figure 26 – Results for word size



Source: Elaborated by the author.

The above figure presents the results of what the model estimates concerning the relationship between RT and word size measured in letters. The trend line indicates that for each letter increase, RTs increase 0.03 on a log scale, as shown in the model results. The shaded area confirms that the results have 95% confidence interval that words have this RT on the log scale. Following the results of the model, I will report the mean of each condition of the model and a paired comparison between experimental and control conditions in Tables 18 and 19:

Table 18 – The means according to the model

Experimental	**Marginal Means RT (ms)**	**Control**	**Marginal Means RT (ms)**
CENSP	962.95	NCENSP	962.95
CENBP	906.87	NCENBP	953.37
CENBPSP	934.49	NCENBPSP	972.63

Source: Elaborated by the author.

Table 19 – Paired comparison of the conditions

Pair of conditions	**Estimate**	**P-Value**
CENSP – NCENSP	-0.00375	1.0000
CENBP – NCENBP	-0.04745	0.9037
CENBPSP – NCENBPSP	-0.03712	0.9654
CENSP – CENBP	0.05736	0.8039
CENSP – CENBPSP	0.02853	0.9908
CENBP – CENBPSP	-0.02883	0.9884

Source: Elaborated by the author.

The model estimates numerical differences across experimental and control conditions, and among experimental conditions. Nevertheless, the numerical differences are not statistically significant. The model compares the conditions in Table 19 using means to estimate

differences between conditions. The Tukey's adjustment post hoc test shows pairwise differences based on distance from zero. The closer the value is to zero, the less the difference between the conditions. Conversely, the further the value is from zero, the greater the difference between the conditions. For instance, the largest numerical difference is 0.05736 in the log scale between CENSP and CENBP. The Tukey's adjustment post hoc test estimates positive (if +) and negative (if -) differences in the estimate column. Negative values indicate that the first condition has a lower mean than the second, implying faster RTs. Positive values indicate that the second condition has a lower mean RT than the first, indicating faster RTs. However, p-values in Table 19 are >0.05 and not significant for all paired comparisons. This confirms the results of the model in Table 17. Having described the analyses, I will discuss the results in the next section.

4.3 GENERAL DISCUSSION

The aim of the current study was to investigate CLI in lexical access in English with the language combination Spanish as L1, Brazilian Portuguese as L2 and English as L3. This study investigated the cognate facilitation effect and the differences in the processing of triple cognate words (CENBPSP) as compared to double cognate words (CENSP or CENBP) and non-cognate words (NCENSP, NCENBP and NCENBPSP). A self-paced reading task was developed, and the target words were triple cognate words, double cognate words and non-cognate words. Statistical results were analysed by means of multiple mixed-effects linear model in R (version 4.5.1; R Core Team, 2025).

Research question 1 – How does visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2, and English as L3 reflect cognate effects? – addressed cognate effects by comparing cognate words with non-cognate words. The hypotheses of this study predicted a cognate facilitation effect (CFE). The results of this study did not align with the discussion of CFE (Nation, 2022; Sanahuja; De Diego-Balaguer; Erdocia, 2025; Bailey; Lockary; Higby, 2024). Research question 2 – Are there differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3? – addressed differences in the processing of triple cognate words compared to double and non-cognate words. The hypotheses of this study proposed a difference across conditions, resulting in a cumulative CLI for triple cognate words compared

to L1 – L3 (Spanish – English). Additionally, this study proposed differences between L2 – L3 (Brazilian Portuguese – English) and L1 – L3 (Spanish – English), as well as between L1 – L2 – L3 (Spanish – Brazilian Portuguese – English). The results of this study were inconsistent with most of the literature (Cenoz; Hufeisen; Jessner, 2001; Hammarberg, 2001; Jessner, 2006; Bardel; Falk, 2007; De Angelis, 2007; Mulík; Carrasco-Ortiz; Amengual, 2019; Germanovna; Viktoroyna; Vladimirovna, 2021; D'angelo, 2023; Otwinowska, 2024). Null effects are unexpected for cognate processing patterns. However, some studies have reported no cognate effect (e.g., Bosma; Nota, 2020; Lijewska, 2023; Rigatti, 2024).

The results of the statistical analyses showed that the model did not reveal any significant effects across conditions, considering the RTs of the sample size of this study. The only variable for which the model estimated a significant change was the word size variable, measured by letter length. The statistical significance was observed in the intercept of the model and in the word size variable. However, the p-value for the intercept indicates that the values are equal to zero, and the p-value for the variable length in letters indicates that the model estimated an effect for this variable. The model reported that results explained about 38% of the variability in RTs (R^2=0.380), indicating that the model explained only 38% of the variance in RTs. This is consistent with the number of effects the model predicted.

The inferential data analyses confirmed the descriptive data analyses, in which the means and median RTs were similar across conditions. Similarly, the median from the responses of participants did not show any difference. When observing the scatter plots, the only trend line that indicated the relationship between RTs and the variable was the length of the word measured in letters. The fitted model confirmed the validity of the descriptive data analyses. The model did not reveal any statistically significant differences across conditions, indicating that the differences between conditions were not substantial enough to be statistically significant.

To make sense of these unexpected null results, I will draw on five possible explanations. The first explanation for the null results concerns the limited statistical power associated with the small sample size (Lijewska, 2023). Although the fitted model revealed numerical differences in RTs across conditions, these differences were not statistically significant ($p \leq 0.05$), as Confidence Intervals (CI) crossed zero. It is important to note that the absence of statistically significant effects should not be interpreted as evidence of equivalence across conditions. This interpretation is extended to Tables 18 and 19, both of which show numerical differences across conditions that are not statistically significant.

The second explanation for the null results concerns environmental factors during data collection. Most psycholinguistic studies are conducted in laboratory settings to maintain experimental control. In contrast, this study was conducted outside of a laboratory, where a full experiment was not achievable, despite efforts to standardise each session. For instance, some sessions at one school took place in the library, where the presence of other students could not be prevented. At another school, ongoing building renovations meant that classrooms had only temporary partition walls. These less than ideal experimental conditions might have introduced noise into the data, potentially obscuring effects that would be detectable under more controlled circumstances.

The third explanation for the null results relates to proficiency. Scores on the English proficiency task ranged from 3 to 30 (M = 14.70, SD = 7.23), with only four participants reaching the standard cut-off score of 26, which indicates knowledge of the 1000 most frequent words in English. Furthermore, the majority of participants (90.6%) reported that their order of language dominance matched their order of learning. Self-rated proficiency scores confirmed that English was their least dominant language, whereas Spanish and Brazilian Portuguese received the highest ratings. These findings suggest that limited English proficiency might have influenced the cognate facilitation effect. However, objective proficiency scores in English did not reach significance in the inferential analyses. Counterintuitively, analyses showed that higher proficiency in English was associated with longer RTs. Possibly, due to interference effects. It is worth noting that this study did not include an objective proficiency measure for Brazilian Portuguese, which would have allowed us to examine whether L2 proficiency or L2 input in immersion settings influenced RTs. Future studies should include this objective measure.

The fourth explanation for the null results concerns the overlap of orthographic and phonological characteristics across Spanish, Brazilian Portuguese and English. Due to the high degree of similarity between Spanish and Brazilian Portuguese, it was not possible to fully control for both orthographic and phonological factors simultaneously. Phonological variation across languages might have obscured potential effects, masking differences that would otherwise have emerged. Future studies should investigate the independent contributions of orthographic and phonological overlap to cognate processing in trilingual populations.

Finally, the fifth explanation for the null results can be understood within the framework of the Complex Dynamic Systems Theory – CDST (Jessner, 2023). Although participants had been immersed in Brazilian Portuguese for approximately 72 months, they reported high daily exposure to both Spanish and Brazilian Portuguese. Self-reported data on language use revealed

that participants' time exposure to reading preferences, and speaking choices were similarly distributed across Spanish and Brazilian Portuguese, with both languages used substantially more than English. In addition, participants reported alternating between Spanish and Brazilian Portuguese in their daily lives. These patterns suggest that Spanish competed equally for activation, indicating that CLI was influenced by recency, frequency and typology proximity (Green, 1998; Jessner, 2023).

In this multilingual context, characterised by language switching, L2 immersion context and ongoing language learning, interference effects may have operated across the L2 – L3 (Brazilian Portuguese – English) condition and have not been resolved through inhibition (Bailey; Lockary; Higby, 2024). This interpretation is consistent with the numerical patterns observed in Tables 18 and 19, where the L2 – L3 (Brazilian Portuguese – English) condition showed the greatest numerical difference (Green, 1998; Grosjean, 2008; Toassi, 2016; Bailey; Lockary; Higby, 2024).

Previous research has found evidence for interference effects. For instance, Toassi and Mota (2018) provided evidence for interference effects in participants' second language in the production of their third language. The results of the study by Toassi and Mota (2018) suggested an asymmetry in the organisation of the lexicon of multilinguals, with the native language establishing stronger lexical links between L1 – L2 and L1 – L3 than L2 – L3. In this study, the language context might have prompted participants to search for their native language (Spanish) when they did not know the meanings of English words, contributing to the lack of statistical significance across conditions (Toassi; Mota, 2018; Bailey; Lockary; Higby, 2024). Potentially, native language activation induced interference effects in the Brazilian Portuguese–English condition due to competition between the languages. However, this interference was not sufficient to produce significant effects in the Spanish – English or Spanish – Brazilian Portuguese – English conditions (Dijkstra, 2005). This pattern may help explain the counterintuitive relationship between higher proficiency in English and longer RTs. Taken together, these findings suggest that languages competed for activation and that interference effects were present, supporting non-selective lexical access consistent with connectionist models. The lexical access models BIA+ (Dijkstra; Van Heuven, 2002), Multilink (Dijkstra *et al.*, 2019) and Multilink + (Dijkstra *et al.*, 2022) all assume connectionist architectures and non-selective processing mechanisms.

This may mean that individual differences and experiences of participants influenced the null results (Herdina; Jessner, 2002; Jessner, 2023; Taylor, 2025). Most psycholinguistic studies have been conducted at European universities (Zhu; Mok, 2020; Carvalho; Mota;

Rigatti, 2022). Additionally, most studies included adults as participants. Multilingual high school students remain an understudied population, especially in the Brazilian context (Rigatti *et al.*, 2023). This study included a non-WEIRD population (Leivada *et al.*, 2023; Draper; Lipina; Zhou, 2026) and investigated lexical access in a language combination that is uncommon.

The Brazilian context reveals the challenges of accounting for individual differences in bilingualism, given that the approach generally adopted is universalist (Mota, 2025). A holistic alternative that might explain the lack of significance in the results of the present study is that cognitive development is related to social experiences of individuals that do not fit the universalist approach (Lipina, 2023; Titone; Tiv, 2023; Rigatti *et al.*, 2023; Mota, 2025). In Rigatti (2024), individual differences of participants influenced cross-language activation. The study by Rigatti (2024) was conducted in the Brazilian context and included a non-WEIRD population as participants. Rigatti (2024) concluded that individual differences, such as the socioeconomic status of participants, overcame any lexical access model due to the influence of the environmental, linguistic and social experiences that bi-multilinguals were surrounded by.

It is possible that the environmental, linguistic and social experiences of participants influenced the null results of CFE in the present study (Rigatti *et al.*, 2023; Rigatti, 2024; Mota, 2025). One concrete manifestation of these factors was the exclusion of four potential participants due to uncorrected vision problems. It took some weeks to exclude these participants. First, participants attempted to deceive the researcher by claiming they had forgotten their glasses. I excluded these participants only when I was certain that participants did not have glasses, despite requiring vision correction. Another concern was that during the sessions, some participants commented on the need to work during the summer to buy their glasses.

Data collected from the LEAP-Q showed information regarding socioeconomic status, such as parental education and occupation (Puglisi; Salles, 2017). As stated by participants, about 48.3% of the parental figure 1 completed undergraduate education (undergraduate or postgraduate), and 25% of the parental figure 2 completed undergraduate education (undergraduate or postgraduate). As in Rigatti (2024), most of the parental figures of participants did not have high levels of education. Additionally, most of the parental figures of participants held occupations with low social prestige. Although parental education and occupation are related to socioeconomic status (Puglisi; Salles, 2017; Rigatti, 2024), future

studies should investigate through other metrics how the socioeconomic status of participants influences CFE.

4.4 READDRESSING THE RESEARCH QUESTIONS AND HYPOTHESES

As previously mentioned, the current dissertation aimed to investigate the two main research questions:

RQ1: How does visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2, and English as L3 reflect cognate effects?

RQ2: Are there differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3?

The findings of the current dissertation address the two proposed research questions and hypotheses as noted below:

Concerning RQ1, this study did not find a CFE, considering the RTs of the small sample size of this study**.** Although there were numerical differences in RTs across conditions, these differences were not statistically significant. Hypotheses 1a, 1b, and 1c of RQ1 were not confirmed, as the results did not provide statistical evidence for the pairs of cognate and non-cognate words.

In relation to RQ2, this study did not find a CFE, considering the RTs of the small sample size of this study**.** There were numerical differences in RTs across L1 – L3 (Spanish – English), L2 – L3 (Brazilian Portuguese – English) and L1 – L2 – L3 (Spanish – Brazilian Portuguese – English) conditions. However, these differences were not statistically significant. Hypotheses 2a, 2b, and 2c of RQ2 were not confirmed. The results of the present study were interpreted as indicating that individual differences, such as the environmental, linguistic, and social experiences of participants, might explain the null results of CFE. The interference effect outweighed the facilitation effect through linguistic experiences of participants towards a null cognate effect across the L2–L3 (Brazilian Portuguese – English) condition. However, coactivation across the languages was insufficient to produce significant effects in the L1 – L3 (Spanish – English) or L1 – L2 – L3 (Spanish – Brazilian Portuguese – English) conditions, resulting in null cognate effects. Recency, frequency, proficiency and typological proximity may have contributed to the absence of a cognate effect. The results of the present study were interpreted as favouring a non-selective configuration of the mental lexicon.

5 CONCLUSION AND FINAL REMARKS

This dissertation investigated CLI in lexical access in English. I examined whether visual word recognition in multilingual speakers of Spanish as L1, Brazilian Portuguese as L2, and English as L3 reflected or did not reflect cognate effects, considering the RTs of this study. I also examined whether there were differences in the processing of triple cognate words (Spanish – Brazilian Portuguese – English) as compared to double cognate words (Spanish – English or Brazilian Portuguese – English) and non-cognate words during visual word recognition by multilingual speakers of Spanish as L1, Brazilian Portuguese as L2 and English as L3.

In summary, the results of the present study can be understood within the framework of CDST. Based on the CDST framework, results are interpreted considering that aspects, such as recency, frequency, proficiency and typological proximity, may have contributed to the absence of cognate effect. The results of the present study are interpreted as interference effects may have operated through language switching, L2 immersion context and ongoing language learning. Language context prompted participants to search for their native language, the most dominant language, which induced interference effects in L2 – L3 condition. However, native language activation was not sufficient to produce significant effects in the L1 – L3 or L1–L2 – L3 conditions. In addition, the results are interpreted taking into account a holistic alternative, in which individual differences, such as the environmental, linguistic and social experiences of participants, might explain the lack of significance in the results of this study. Considering the CDST, language systems are interpreted as dynamic, separated and interdependent, and lexical access as non-selective and context dependent. Lexical access is argued in favour of the connectionist models and in favour of the BIA+ (Dijkstra; Van Heuven, 2002), the Multilink (Dijkstra *et al.*, 2019) and the Multilink+ (Dijkstra *et al.*, 2022).

5.1 LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The present study has several limitations that may affect the interpretation of the results. This section identifies four limitations. In what follows, I address the limitations and offer suggestions for future research. The first limitation is the small sample of participants in this study. For studies that will investigate the same population in the same context, it would be beneficial to include a wide range of schools in different cities to increase the sample size. The

second limitation is the lack of ideal experimental conditions. Future studies should test the stimuli used in this study in laboratory settings to maintain full experimental control.

The third limitation concerns the length of words in letters. I could not control for letter length across the three conditions due to the complexity of assessing similarity between Spanish and Brazilian Portuguese when selecting stimuli. The fourth limitation is the lack of an objective proficiency measure for Brazilian Portuguese to analyse whether L2 proficiency influenced or not RTs. Future studies should include a Brazilian Portuguese proficiency test or the assessments of participants from the school.

Also, future studies should use the stimuli from this study with multilingual speakers of Spanish as L1, English as L2, and Brazilian Portuguese as L3. Furthermore, future studies should investigate how the environmental, linguistic and social experiences of participants influenced RTs. Another possibility is that future studies should investigate the influence of time of immersion and linguistic experiences in relation to RTs. Lastly, subsequent studies could replicate this study with hemodynamic, electrophysiological measures of brain activity and/or eye-tracking techniques.

5.2 PEDAGOGICAL IMPLICATIONS

The findings of this study may help foreign language instruction, especially in the Brazilian context. The results of this study suggested that language context might have prompted participants to search for their native language when participants did not know the meaning of words in English. From this perspective, students' native language might be a key resource for foreign language teachers when introducing a new language to facilitate language acquisition.

Various teaching strategies can be adopted to include cognates in foreign language instruction, such as explicit instruction, contextual learning activities, multilingual cognitive training, cognate mapping exercises, story creation with cognates, pronunciation challenges and other cognate activities, which can support foreign language instruction and enhance lexical competence (Oberste-Berghaus, 2025). Overall, the results of this study suggest that the native language of participants is an effective strategy for facilitating new language learning, as languages interact and may be interconnected in a dynamic and interdependent network (Oberste-Berghaus, 2025).

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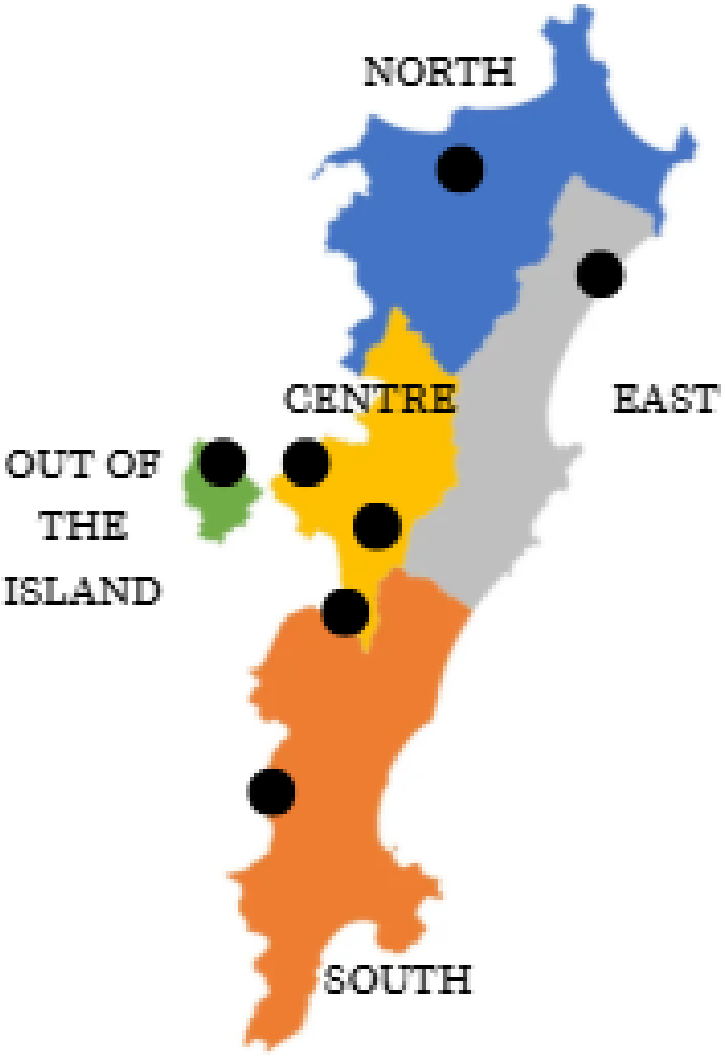
APPENDIX A – SCHOOLS



APPENDIX B – THE PROFICIENCY TASK IN ENGLISH







UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TAREFA DE PROFICIÊNCIA EM INGLÊS

Código de identificação do participante:_____ Data de hoje: _____

WEBB, Stuart; SASAO, Yosuke; BALLANCE, Oliver. The updated Vocabulary Levels Test: Developing and validating two new forms of the VLT. **ITL - International Journal of Applied Linguistics**, v. 168, n. 1, p. 34-70, 2017.

The updated Vocabulary Levels Test (Webb, Sasao & Ballance, 2017)

This is a test that looks at how well you know useful English words. Put a check under the word that goes with each meaning. Here is an example.

	game	island	mouth	movie	song	yard
land with water all around it						
part of your body used for eating and talking						
piece of music						

It should be answered in the following way.

	game	island	mouth	movie	song	yard
land with water all around it		X				
part of your body used for eating and talking			X			
piece of music					X	

1,000 Word Level

	choice	computer	garden	photograph	price	week
cost						
picture						
place where things grow outside						

	eye	father	night	van	voice	year
body part that sees						
parent who is a man						
part of the day with no sun						

WEBB, Stuart; SASAO, Yosuke; BALLANCE, Oliver. The updated Vocabulary Levels Test: Developing and validating two new forms of the VLT. **ITL - International Journal of Applied Linguistics**, v. 168, n. 1, p. 34-70, 2017.

	center	note	state	tomorrow	uncle	winter
brother of your mother or father						
middle						
short piece of writing						

	box	brother	horse	hour	house	plan
family member						
sixty minutes						
way of doing things						

	animal	bath	crime	grass	law	shoulder
green leaves that cover the ground						
place to wash						
top end of your arm						

	drink	educate	forget	laugh	prepare	suit
get ready						
make a happy sound						
not remember						

	check	fight	return	tell	work	write
do things to get money						
go back again						
make sure						

	bring	can	reply	stare	understand	wish
say or write an answer to somebody						
carry to another place						
look at for a long time						

	alone	bad	cold	green	loud	main
most important						
not good						
not hot						

	awful	definite	exciting	general	mad	sweet
certain						
usual						
very bad						

APPENDIX C – EXPERIMENTAL AND CONTROL SENTENCES

	SENTENCES in C1
1	Kim caught the bottle before it hit the ground.
	Kim caught the bubble before it hit the ground.
2	Jayde cooked a chayote dish to eat with rice.
	Jayde cooked a pumpkin dish to eat with rice.
3	Shelly saw a big cockroach crawling on the floor.
	Shelly saw a big earthworm crawling on the floor.
4	Liz saw the concierge hiding beneath the lift.
	Liz saw the earthworm hiding beneath the lift.
5	Jason drew a dolphin jumping over the waves.
	Jason drew a buzzard flying over the waves.
6	Jeff spotted a gecko on the basement floor.
	Jeff spotted a screw on the basement floor.
7	Lauren saw the islander walking along the beach.
	Lauren saw the bathrobe placed on the bench.
8	Phil chopped the lettuce quickly before setting the table.
	Phil chopped the pumpkin quickly before setting the table.
9	Lisa took the pants off the garden clothesline.
	Lisa took the skirt off the garden clothesline.
10	Nina called the plumber to hire them to fix the leak.
	Nina called the daycare to bring her little son home.
11	Emma found the replacement part for the broken machine.
	Emma found the pomegranate seeds in the grocery bag.
12	Brad ate seasoned snacks after finishing his race.
	Brad ate zucchini snacks after finishing his race.
13	Mark bought the sesame butter at the grocery store.
	Mark bought the peanut butter at the grocery store.
14	Jane lifted the tea cup slowly from the dining table.
	Jane lifted the pan lid slowly from the dining table.
15	Brent followed the tram on the main town bridge.
	Brent followed the worm on the main town bridge.

16	Tom found a trap while running around the table.
	Tom found a bowl while running around the table.

	SENTENCES in C2
1	Alex noticed the employee's accuracy improved in their essay.
	Alex noticed the employee's trousers were dark gray.
2	Carl asked his friend for an alibi hoping to avoid the trial.
	Carl asked his friend for a scarf hoping to avoid the cold.
3	Beth picked the best babysitter she could find in town.
	Beth picked the best watermelon she could find in town.
4	Josy held the balloon close to the front door.
	Josy held the garbage close to the front door.
5	Keith walked near the blackout during the storm.
	Keith walked near the sidewalk during the storm.
6	Chris threw the carpet into the small room.
	Chris threw the helmet into the small room.
7	Karen noticed her discomfort increasing throughout her walk.
	Karen noticed the strawberry growing throughout their walk.
8	Angie overheard a fact while talking to her cousin.
	Angie overheard a guff while talking to her cousin.
9	Rita cleaned the dirty funnel which now looks brand new.
	Rita cleaned the dirty window which now looks brand new.
10	Ken carried the grass to his truck.
	Ken carried the drill to his truck.
11	John looked at his handball coach for advice.
	John looked in his bathrobe pocket for a tissue.
12	Paul cleaned his lapel after spilling wine on himself.
	Paul cleaned his thigh after spilling wine on himself.
13	Kayla shared a link with her new accountant.
	Kayla shared a guff with her new accountant.
14	David purchased a marshmallow to share with everyone.
	David purchased a pomegranate to share with everyone.
15	Megan watched the overdose report unfold on the news.

	Megan watched the squirrel crash unfold on the news.
16	Ellen found a big pot under the old tree.
	Ellen found a big fox under the old tree.

	SENTENCES in C3
1	Alan saw the actor at the market with his dog.
	Alan saw the mayor at the market with his dog.
2	Susie watched a wild animal cross the road quickly.
	Susie watched a wild pigeon cross the road quickly.
3	Jamie cooked the base before baking the cake.
	Jamie cooked the corn before baking the cake.
4	Mary grabbed the camera from the dining table for her husband.
	Mary grabbed the gloves from the dining table for her husband.
5	Lana went to the dentist before having her breakfast.
	Lana went to the nursery before having her breakfast.
6	Ryan heard the echo scare him on the trail.
	Ryan heard the dove scare him on the trail.
7	Kate tasted a sweet fruit from the tree in my backyard.
	Kate tasted a sweet peach from the tree in my backyard.
8	Jack heard the guitar sound when people arrived.
	Jack heard the street noise when people arrived.
9	Karen left the hotel to get home before sunset.
	Karen left the alley to get home before sunset.
10	Steve placed the map into his backpack to start his journey.
	Steve placed the ham into his backpack to start his journey.
11	Cassie broke their pact after the meeting ended.
	Cassie broke their knee after the meeting ended.
12	Max reviewed the paper to take to the meeting.
	Max reviewed the draft to take to the meeting.
13	Ted bought a wooden piano at a store in the neighborhood.
	Ted bought a wooden spoon at a store in the neighborhood.
14	Tony found a poem inside the gym locker.
	Tony found a plum inside the gym locker.

15	Tina broke her radio while running with the toddlers.
	Tina broke her elbow while running with the toddlers.
16	Frank spotted the rat hiding under the stairs.
	Frank spotted the owl hiding under the stairs.

APPENDIX D – EXPERIMENTAL AND CONTROL WORDS

	EC1	Word Class	CC1	Word Class	Number of letters
1	bottle	noun	bubble	noun	6
2	chayote	noun	pumpkin	noun	7
3	cockroach	noun	earthworm	noun	9
4	concierge	noun	earthworm	noun	9
5	dolphin	noun	buzzard	noun	7
6	gecko	noun	screw	noun	5
7	islander	noun	bathrobe	noun	8
8	lettuce	noun	pumpkin	noun	7
9	pants	noun	skirt	noun	5
10	plumber	noun	daycare	noun	7
11	replacement	noun	pomegranate	noun	11
12	seasoned	adj	zucchini	noun	8
13	sesame	noun	peanut	noun	6
14	tea	noun	pan	noun	3
15	tram	noun	worm	noun	4
16	trap	noun	bowl	noun	4

	EC2	Word Class	CC2	Word Class	Number of letters
1	accuracy	noun	trousers	noun	8
2	alibi	noun	scarf	noun	5
3	babysitter	noun	watermelon	noun	10
4	ballon	noun	garbage	noun	7
5	blackout	noun	sidewalk	noun	8
6	carpet	noun	helmet	noun	6
7	discomfort	noun	strawberry	noun	10
8	fact	noun	guff	noun	4
9	funnel	noun	window	noun	6
10	grass	noun	drill	noun	5
11	handball	noun	bathrobe	noun	8
12	lapel	noun	thigh	noun	5
13	link	noun	guff	noun	4
14	marshmallow	noun	pomegranate	noun	11
15	overdose	noun	squirrel	noun	8
16	pot	noun	fox	noun	3

	EC3	Word Class	CC3	Word Class	Number of letters
1	actor	noun	mayor	noun	5
2	animal	noun	pigeon	noun	6
3	base	noun	corn	noun	4
4	camera	noun	gloves	noun	6
5	dentist	noun	nursery	noun	7
6	echo	noun	dove	noun	4
7	fruit	noun	peach	noun	5
8	guitar	noun	street	noun	6
9	hotel	noun	alley	noun	5
10	map	noun	ham	noun	3
11	pact	noun	knee	noun	4
12	paper	noun	draft	noun	5
13	piano	noun	spoon	noun	5
14	poem	noun	plum	noun	4
15	radio	noun	elbow	noun	5
16	rat	noun	owl	noun	3

APPENDIX E – FILLER SENTENCES

Stimuli from the study of Wisintainer and Mota (2025):

1- I usually rip open the package before I reach the cashier.

Stimuli from the study of Toassi; Mota; Teixeira (2020):

1- As we got to know each other we felt a close bond growing between us.

2- The child saw that the new toy had arrived.

3- She does not want him to hate her new boss.

4- Jennifer washes her clothes every evening.

5- They try to call for help but there is nobody out there.

6- My daughter loves to climb the tree in the back of the garden.

7- Her sisters try to find the missing toy.

8- Just the right spices made the sauce even tastier.
Question: Did the sauce taste good with the right spices?

9- Jeremy wants to make a beautiful drawing for her birthday.

10- The mother gets angry when they eat too much candy.

11- The girls learn a lot at their new school.

12- They were looking for the missing letters of the crossword puzzle.

13- The boys have to sleep in one big room in the holiday cottage.

14- Liam knows that they always scare many people when they wear their ghost costumes.

Stimuli from the study of Haag (2015):

1- Rupert has been afraid of spiders since he was 5 years old.

2- Elizabeth and Elliott never swim in the lake.

3- Jordan and Taylor have done a great job in Michigan (adapted Florianópolis).

4- Molly doesn’t know how many classmates she has.

5- Martin’s girlfriend flew to Tokyo to see him.

6- Mike took care of his sister in the evening.

7- Luke and Bob have been to the USA twice.

8- Mia hasn’t seen her brother since last year.

9- The worst foods for health are those high in starch and sugars.

10- He doesn’t know how to ride a horse.

Stimuli from the book Essential Grammar in Use (Murphy, 2010):

1- I rarely go to bed before midnight.

2- I can’t buy anything until you give me some money.

3- If you don’t want this magazine I will throw it away.

4- Paty is sorry for not coming to your party.

5- Gary cleaned the shelves and then he put the books back.

6- I would be happier if I could get a better job.

7- Last week I went back to the town where I was born.

APPENDIX F – COMPREHENSION QUESTIONS

1- Did Lana go to the nursery after having her breakfast?

2- Did Kate taste a sour fruit from the tree?

3- Did Kate taste a peach from the tree?

4- Did Brad eat seasoned snacks following his race?

5- Did Ken carry the drill to his car?

6- Did Jade cook a cake?

7- Did Chris throw the helmet into a tiny room?

8- Did Nina call her mother?

9- Did Susie watch a wild animal cross the road fast?

10- Did Jamie cook the base after baking the cake?

11- Did Brent follow the worm?

12- Was the mayor with his pet at the market?

13- Did Paul spill water on himself?

14- Did Tony find a book?

15- Did Rita clean her house?

16- Did Tina break her elbow while running with the kids?

17- Did Shelly see a small cockroach?

18- Did Jack hear the guitar sound?

19- Did Liz see her father?

20- Did the sauce taste good with the right spices?

21- Did Cassie break their knee before the meeting?

22- Did Frank spot an animal?

23- Did Jane lift the tea cup quickly from the dining table?

24- Did Karen leave the hotel?

APPENDIX G – THE KEYBOARD



APPENDIX H – MESSAGES FROM THE SELF-PACED READING TASK

Seja bem-vindo à tarefa de leitura automonitorada!

Nesta tarefa, você participará do treinamento e da tarefa principal.
Pressione a BARRA DE ESPAÇO no teclado sempre que você quiser avançar para o próximo item.
Se você tiver perguntas antes, durante ou depois da tarefa, por favor sinta-se à vontade para perguntar.

No treinamento você irá praticar a tarefa para ver como ela funciona.

Primeiro, você verá uma cruz (+) de fixação na tela.
É para ela que você deve olhar.

Depois, as palavras da frase aparecerão uma por vez na tela do computador.

Ao ver uma palavra, pressione a BARRA DE ESPAÇO no teclado para passar para a próxima palavra, até chegar ao final da frase.

Por favor, pressione a barra de espaço no teclado na velocidade natural que você lê palavras em inglês.

Preste atenção às frases.
Haverá perguntas de compreensão sobre elas.
Aperte Y para YES ou N para NO para responder à pergunta de compreensão.

Vamos começar o treinamento?

Pressione a BARRA DE ESPAÇO no teclado para continuar.

O treinamento foi finalizado.

Você tem alguma dúvida?

Quando estiver pronto para iniciar a tarefa principal, pressione a BARRA DE ESPAÇO no teclado para continuar.

Agora, vamos iniciar a tarefa principal.

Primeiro, você verá uma cruz (+) de fixação na tela.
É para ela que você deve olhar.

Depois, as palavras da frase aparecerão uma por vez na tela do computador.

Ao ver uma palavra, pressione a BARRA DE ESPAÇO no teclado para passar para a próxima palavra, até chegar ao final da frase.

Por favor, pressione a barra de espaço na velocidade natural que você lê palavras em inglês.

Preste atenção às frases.
Haverá perguntas de compreensão sobre elas.
Aperte Y para YES ou N para NO para responder à pergunta de compreensão.

Vamos começar a tarefa principal?

Pressione a BARRA DE ESPAÇO no teclado para continuar.

Vamos fazer uma breve pausa?

Antes de iniciarmos o próximo bloco, aproveite o momento para tomar água ou descansar.

Quando estiver pronto para continuar, pressione a BARRA DE ESPAÇO no teclado.

A tarefa foi finalizada.

Obrigada pela sua participação.

Você tem alguma dúvida?

APPENDIX I – EMPIRICAL STUDIES

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APPENDIX J – STUDIES FROM THE OSF

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APPENDIX K – NLD ORTHOGRAPHIC SIMILARITY

	EC1					
	Word 1 English	**Word 2 Spanish**	**Word 3 Brazilian Portuguese**	**Sim Word 1 and 2**	**Sim Word 1 and 3**	**Sim Word 2 and 3**
1	chayote	chayote	chuchu	1.00	0.29	0.29
2	sesame	sésamo	gergelim	0.83	0.13	0.13
3	gecko	geco	lagartixa	0.80	0.11	0.11
4	trap	trampa	armadilha	0.67	0.22	0.33
5	tea	té	chá	0.67	0.33	0.00
6	concierge	conserje	porteiro	0.67	0.22	0.25
7	dolphin	delfín	golfinho	0.57	0.38	0.50
8	plumber	plomero	encanador	0.57	0.11	0.11
9	bottle	botella	garrafa	0.57	0.00	0.14
10	cockroach	cucaracha	barata	0.56	0.22	0.44
11	islander	isleño	ilhéu	0.50	0.38	0.33
12	seasoned	sazonado	temperado	0.50	0.22	0.33
13	pants	pantalón	calça	0.50	0.20	0.25
14	lettuce	lechuga	alface	0.43	0.29	0.00
15	tram	tranvia	bonde	0.43	0.00	0.14
16	replacement	reemplazo	substituição	0.27	0.00	0.08

Note: words 1 and 2 were cognate words and both words 1 and 2 were non-cognate words in parallel with word 3 in EC1.

	EC2					
	Word 1 English	**Word 2 Brazilian Portuguese**	**Word 3 Spanish**	**Sim Word 1 and 2**	**Sim Word 1 and 3**	**Sim Word 2 and 3**
1	overdose	overdose	sobredosis	1.00	0.40	0.40
2	marshmallow	marshmallow	malvavisco	1.00	0.27	0.27
3	link	link	enlace	1.00	0.17	0.17
4	alibi	álibi	coartada	1.00	0.13	0.13
5	lapel	lapela	solapa	0.83	0.33	0.33
6	pot	pote	olla	0.75	0.00	0.00
7	discomfort	desconforto	incomodidad	0.73	0.27	0.09
8	ballon	balão	globo	0.67	0.17	0.20
9	funnel	funil	embudo	0.67	0.00	0.00
10	handball	handebol	balonmano	0.63	0.22	0.22
11	accuracy	acurácia	exactitud	0.63	0.11	0.11
12	grass	grama	césped	0.60	0.00	0.00
13	blackout	blecaute	apagón	0.50	0.25	0.13
14	fact	fato	hecho	0.50	0.20	0.20
15	carpet	tapete	alfombra	0.50	0.00	0.00
16	babysitter	babá	niñera	0.30	0.20	0.17

Note: words 1 and 2 were cognate words and both words 1 and 2 were non-cognate words in parallel with word 3 in EC2.

	EC3					
	Word 1 English	**Word 2 Brazilian Portuguese**	**Word 3 Spanish**	**Sim Word 1 and 2**	**Sim Word 1 and 3**	**Sim Word 2 and 3**
1	piano	piano	piano	1.00	1.00	1.00
2	radio	rádio	radio	1.00	1.00	1.00
3	hotel	hotel	hotel	1.00	1.00	1.00
4	animal	animal	animal	1.00	1.00	1.00
5	base	base	base	1.00	1.00	1.00
6	dentist	dentista	dentista	0.88	0.88	1.00
7	camera	câmera	cámara	1.00	0.83	0.83
8	paper	papel	papel	0.80	0.80	1.00
9	poem	poema	poema	0.80	0.80	1.00
10	actor	ator	actor	0.80	1.00	0.80
11	pact	pacto	pacto	0.80	0.80	1.00
12	echo	eco	eco	0.75	0.75	1.00
13	guitar	guitarra	guitarra	0.75	0.75	1.00
14	map	mapa	mapa	0.75	0.75	1.00
15	fruit	fruta	fruta	0.60	0.60	1.00
16	rat	rato	ratón	0.75	0.60	0.80

Note: words 1, 2 and 3 were cognate words in EC3.

	CC1					
	Word 1 English	**Word 2 Brazilian Portuguese**	**Word 3 Spanish**	**Sim Word 1 and 2**	**Sim Word 1 and 3**	**Sim Word 2 and 3**
1	worm	minhoca	gusano	0.14	0.00	0.00
2	buzzard	urubu	zopilote	0.14	0.00	0.00
3	bowl	tigela	cuenco	0.17	0.00	0.00
4	earthworm	minhoca	lombriz	0.22	0.00	0.00
5	earthworm	minhoca	lombriz	0.22	0.00	0.00
6	pumpkin	abóbora	calabaza	0.00	0.00	0.38
7	pumpkin	abóbora	calabaza	0.00	0.00	0.38
8	pan	frigideira	sartén	0.00	0.33	0.10
9	skirt	saia	falda	0.40	0.00	0.40
10	bathrobe	roupão	albornoz	0.13	0.13	0.13
11	screw	parafuso	tornillo	0.13	0.13	0.25
12	zucchini	abobrinha	calabacín	0.22	0.11	0.22
13	peanut	amendoim	cacahuete	0.13	0.33	0.11
14	daycare	creche	guardería	0.29	0.22	0.22
15	bubble	bolha	burbuja	0.17	0.43	0.29
16	pomegranate	romã	granada	0.27	0.45	0.29

Note: words 1, 2 and 3 were non-cognate words in CC1.

	CC2					
	Word 1 English	**Word 2 Brazilian Portuguese**	**Word 3 Spanish**	**Sim Word 1 and 2**	**Sim Word 1 and 3**	**Sim Word 2 and 3**
1	thigh	coxa	muslo	0.00	0.00	0.00
2	guff	bobagem	tonterías	0.00	0.00	0.11
3	guff	bobagem	tonterías	0.00	0.00	0.11
4	garbage	lixo	basura	0.00	0.14	0.00
5	trousers	calça	pantalón	0.00	0.00	0.25
6	scarf	cachecol	bufanda	0.13	0.14	0.00
7	fox	raposa	zorro	0.17	0.20	0.00
8	strawberry	morango	frutilla	0.20	0.10	0.00
9	drill	furadeira	taladro	0.22	0.00	0.33
10	helmet	capacete	casco	0.25	0.00	0.38
11	watermelon	melancia	sandía	0.10	0.10	0.50
12	bathrobe	roupão	albornoz	0.13	0.13	0.13
13	window	janela	ventana	0.17	0.14	0.29
14	squirrel	esquilo	ardilla	0.38	0.13	0.14
15	sidewalk	calçada	acera	0.13	0.25	0.43
16	pomegranate	romã	granada	0.27	0.45	0.29

Note: words 1, 2 and 3 were non-cognate words in CC2.

	CC3					
	Word 1 English	**Word 2 Brazilian Portuguese**	**Word 3 Spanish**	**Sim Word 1 and 2**	**Sim Word 1 and 3**	**Sim Word 2 and 3**
1	mayor	prefeito	alcalde	0.00	0.14	0.00
2	corn	milho	maíz	0.00	0.00	0.20
3	spoon	colher	cuchara	0.00	0.00	0.43
4	draft	rascunho	borrador	0.13	0.25	0.00
5	plum	ameixa	ciruela	0.00	0.14	0.14
6	owl	coruja	búho	0.17	0.00	0.17
7	knee	joelho	rodilla	0.17	0.00	0.29
8	street	rua	calle	0.17	0.17	0.00
9	ham	presunto	jamón	0.00	0.40	0.13
10	alley	beco	callejón	0.00	0.50	0.25
11	elbow	cotovelo	codo	0.13	0.20	0.38
12	peach	pêssego	durazno	0.29	0.14	0.14
13	nursery	creche	guardería	0.14	0.44	0.22
14	pigeon	pombo	paloma	0.33	0.17	0.33
15	dove	pomba	paloma	0.20	0.17	0.50
16	gloves	luvas	guantes	0.50	0.43	0.29

Note: words 1, 2 and 3 were non-cognate words in CC3.

APPENDIX L – FREQUENCY

	EC1	Frequency per million	CC1	Frequency per million
1	islander	407	bathrobe	1.323
2	gecko	375	screw	3.015
3	tea	46.174	pan	19.294
4	bottle	32.786	bubble	13.252
5	pants	29.782	skirt	11.149
6	replacement	16.764	pomegranate	1.162
7	trap	11.656	bowl	53.439
8	lettuce	5.112	pumpkin	8.485
9	seasoned	4.518	zucchini	2.498
10	dolphin	2.966	buzzard	447
11	plumber	2.35	daycare	2.017
12	sesame	1.951	peanut	8.437
13	concierge	1.448	earthworm	301
14	tram	1.212	worm	4.925
15	cockroach	1.137	earthworm	301
16	chayote	0	pumpkin	8.485

	EC1					
	EN	Frequency per million	SP	Frequency per million	NC BP	Frequency per million
1	islander	407	isleño	246	ilhéu	397
2	gecko	375	geco	61	lagartixa	721
3	tea	46.174	té	27.927	chá	32.284
4	bottle	32.786	botella	32.391	garrafa	13.541
5	pants	29.782	pantalón	14.595	calça	12.043
6	replacement	16.764	reemplazo	13.422	substituição	21.146
7	trap	11.656	trampa	27.856	armadilha	6.628
8	lettuce	5.112	lechuga	6.819	alface	3.955
9	seasoned	4.518	sazonado	93	temperado	679
10	dolphin	2.966	delfín	3.576	golfinho	916
11	plumber	2.35	plomero	882	encanador	463
12	sesame	1.951	sésamo	1.878	gergelim	728
13	concierge	1.448	conserje	1.591	porteiro	2.791
14	tram	1.212	tranvia	207	bonde	2.256
15	cockroach	1.137	cucaracha	2.246	barata	2.42
16	chayote	0	chayote	466	chuchu	1.273

	CC1					
	EN	**Frequency per million**	**NC BP**	**Frequency per million**	**NC SP**	**Frequency per million**
1	buzzard	447	urubu	1.073	zopilote	678
2	earthworm	301	minhoca	1.252	lombriz	1.489
3	earthworm	301	minhoca	1.252	lombriz	1.489
4	bowl	53.439	tigela	4.261	cuenco	1.936
5	pan	19.294	frigideira	5	sartén	7.4
6	bubble	13.252	bolha	6.568	burbuja	17.767
7	skirt	11.149	saia	20.366	falda	11.443
8	pumpkin	8.485	abóbora	3.785	calabaza	5.644
9	pumpkin	8.485	abóbora	3.785	calabaza	5.644
10	peanut	8.437	amendoim	3.155	cacahuete	811
11	worm	4.925	minhoca	1.252	gusano	7.938
12	screw	3.015	parafuso	2.404	tornillo	3.643
13	zucchini	2.498	abobrinha	949	calabacín	1.015
14	daycare	2.017	creche	5.762	guardería	6.249
15	bathrobe	1.323	roupão	625	albornoz	326
16	pomegranate	1.162	romã	2.573	granada	3.444

	EC2	**Frequency per million**	**CC2**	**Frequency per million**
1	marshmallow	861	pomegranate	1.162
2	handball	407	bathrobe	1.323
3	fact	345.343	guff	172
4	link	38.899	guff	172
5	grass	29.631	drill	8.178
6	pot	25.033	fox	8.613
7	accuracy	16.662	trousers	4.685
8	carpet	12.433	helmet	10.328
9	ballon	8.013	garbage	17.56
10	discomfort	6.593	strawberry	4.519
11	alibi	2.925	scarf	5.497
12	funnel	2.562	window	90.259
13	overdose	2.434	squirrel	3.758
14	blackout	2.364	sidewalk	11.438
15	babysitter	2.203	watermelon	2.173
16	lapel	1.122	thigh	5.637

	EC2					
	EN	**Frequency per million**	**BP**	**Frequency per million**	**NC SP**	**Frequency per million**
1	marshmallow	861	marshmallow	331	malvavisco	237
2	handball	407	handebol	448	balonmano	1.688
3	fact	345.343	fato	206.204	hecho	415.257
4	link	38.899	link	62.011	enlace	90.415
5	grass	29.631	grama	6.908	césped	8.299
6	pot	25.033	pote	4.72	olla	14.49
7	accuracy	16.662	acurácia	199	exactitud	18.835
8	carpet	12.433	tapete	10.95	alfombra	10.246
9	ballon	8.013	balão	5.119	globo	19.635
10	discomfort	6.593	desconforto	12.519	incomodidad	8.128
11	alibi	2.925	álibi	904	coartada	2.537
12	funnel	2.562	funil	1.196	embudo	3.027
13	overdose	2.434	overdose	2.512	sobredosis	5.211
14	blackout	2.364	blecaute	366	apagón	5.976
15	babysitter	2.203	babá	4.131	niñera	2.613
16	lapel	1.122	lapela	599	solapa	1.757

	CC2					
	EN	**Frequency per million**	**NC BP**	**Frequency per million**	**NC SP**	**Frequency per million**
1	guff	172	bobagem	8.659	tonterías	12.655
2	guff	172	bobagem	8.659	tonterías	12.655
3	window	90.259	janela	42.025	ventana	70.151
4	garbage	17.56	lixo	51.515	basura	79.487
5	sidewalk	11.438	calçada	7.227	acera	8.518
6	helmet	10.328	capacete	5.341	casco	21.419
7	fox	8.613	raposa	3.557	zorro	4.993
8	drill	8.178	furadeira	380	taladro	2.029
9	thigh	5.637	coxa	3.721	muslo	4.405
10	scarf	5.497	cachecol	1.605	bufanda	2.216
11	trousers	4.685	calça	12.043	pantalón	14.595
12	strawberry	4.519	morango	4.603	frutilla	1.06
13	squirrel	3.758	esquilo	880	ardilla	1.794
14	watermelon	2.173	melancia	2.765	sandía	3.071
15	bathrobe	1.323	roupão	625	albornoz	326
16	pomegranate	1.162	romã	2.573	granada	3.444

	EC3	Frequency per million	CC3	Frequency per million
1	paper	126.329	draft	27.286
2	radio	81.302	elbow	9.829
3	base	78.001	corn	26.339
4	camera	74.259	gloves	13.001
5	hotel	68.664	alley	11.296
6	animal	58.091	pigeon	2.625
7	map	40.057	ham	7.076
8	fruit	33.296	peach	5.055
9	actor	33.178	mayor	48.632
10	guitar	18.083	street	188.599
11	poem	17.942	plum	3.427
12	piano	17.112	spoon	9.339
13	rat	12.874	owl	5.429
14	dentist	6.073	nursery	5.827
15	echo	5.851	dove	3.152
16	pact	4.851	knee	24.32

	EC3					
	EN	Frequency per million	BP	Frequency per million	SP	Frequency per million
1	paper	126.329	papel	209.419	papel	305.123
2	radio	81.302	rádio	56.165	radio	158.721
3	base	78.001	base	216.724	base	399.134
4	camera	74.259	câmera	24.325	cámara	135.183
5	hotel	68.664	hotel	49.006	hotel	77.331
6	animal	58.091	animal	49.26	animal	67.253
7	map	40.057	mapa	32.839	mapa	61.672
8	fruit	33.296	fruta	21.496	fruta	33.486
9	actor	33.178	ator	33.747	actor	85.639
10	guitar	18.083	guitarra	11.354	guitarra	40.546
11	poem	17.942	poema	28.541	poema	50.322
12	piano	17.112	piano	9.396	piano	12.666
13	rat	12.874	rato	8.786	ratón	19.106
14	dentist	6.073	dentista	6.339	dentista	8.134
15	echo	5.851	eco	7.588	eco	32.602
16	pact	4.851	pacto	11.924	pacto	50.458

	CC3					
	EN	**Frequency per million**	**NC BP**	**Frequency per million**	**NC SP**	**Frequency per million**
1	street	188.599	rua	129.252	calle	256.5
2	mayor	48.632	prefeito	55.317	alcalde	97.7
3	draft	27.286	rascunho	2.006	borrador	9.685
4	corn	26.339	milho	17.658	maíz	47.794
5	knee	24.32	joelho	11.487	rodilla	20.709
6	gloves	13.001	luvas	5.66	guantes	10.761
7	alley	11.296	beco	2.97	callejón	7.558
8	elbow	9.829	cotovelo	3.568	codo	10.443
9	spoon	9.339	colher	19.101	cuchara	8.214
10	ham	7.076	presunto	2.988	jamón	9.311
11	nursery	5.827	creche	5.762	guardería	6.249
12	owl	5.429	coruja	1.908	búho	2.161
13	peach	5.055	pêssego	1.698	durazno	3.033
14	plum	3.427	ameixa	1.348	ciruela	1.23
15	dove	3.152	pomba	3.164	paloma	11.428
16	pigeon	2.625	pombo	1.775	paloma	11.428

APPENDIX M – INVITATION FOR NATIVE SPEAKERS OF ENGLISH

ENGLISH NATIVE SPEAKERS NEEDED FOR SELECTION OF LINGUISTIC STIMULI IN ACADEMIC RESEARCH

Dear Participant,

My name is Kamila Heusi Fourteau, I am a master student at the Programa de Pôs-Graduação em Inglês: Estudos Linguísticos e Literários from Universidade Federal de Santa Catarina (UFSC), in Brazil. My advisor is Professor Dr. ª Mailce Borges Mota from UFSC. We would like to invite you to participate in the selection of the linguistic stimuli of our study regarding crosslinguistic influence between English, Brazilian Portuguese and Spanish.

WHO IS ELIGIBLE? Native speakers of English aged 18 or over.

DESCRIPTION OF THE TASK

First, you will read a free and informed consent form (TCLE) regarding our study and decide if you are interested in taking part in this study. If you decide to help us out, you will be presented with a series of sentences in English. Your task is to judge how acceptable each sentence sounds to you as a native speaker of English. We won't analyse your individual responses or perform statistical tests on them. We just want to make sure our sentences sound natural to native speakers.

INTERESTED? If you are interested in participating, please go to https://docs.google.com/forms/d/e/1FAIpQLScA1C6L6FMZrgStk6MT_OJZfYJ0VcicGNLFxEEmwaSrjXjDog/viewform?usp=header

CONTACT

If you decide to participate and then want to withdraw from the research, you are free to withdraw at any time without any consequences. Please contact us by email to inform us of your withdrawal:

Kamila Heusi Fourteau – kamilaheusi@gmail.com

Professor Dr. ª Mailce Borges Mota – mailce.mota@ufsc.br

One attachment • Scanned by Gmail



UNIVERSIDADE FEDERAL DE SANTA CATARINA PPGI LabLing fapesc

ENGLISH NATIVE SPEAKERS NEEDED FOR SELECTION OF LINGUISTIC STIMULI IN ACADEMIC RESEARCH

Dear Participant,

My name is Kamila Heusi Fourteau, I am a master student at the Programa de Pós-Graduação em Inglês: Estudos Linguísticos e Literários from Universidade Federal de Santa Catarina (UFSC), in Brazil. My advisor is Professor Dr. ª Mailce Borges Mota from UFSC. We would like to invite you to participate in the selection of the linguistic stimuli of our study regarding crosslinguistic influence between English, Brazilian Portuguese and Spanish.

WHO IS ELIGIBLE? Native speakers of English aged 18 or over.

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First, you will read a free and informed consent form (TCLE) regarding our study and decide if you are interested in taking part in this study. If you decide to help us out, you will be presented with a series of sentences in English. Your task is to judge how acceptable each sentence sounds to you as a native speaker of English. We won't analyse your individual responses or perform statistical tests on them. We just want to make sure our sentences sound natural to native speakers.

INTERESTED? If you are interested in participating, please go to https://docs.google.com/forms/d/e/1FAIpQLScA1C6L6FMZrgStk6MT_OJZfYJ0VcicGNLFxEEmwaSrjXjDog/viewform?usp=header

CONTACT

If you decide to participate and then want to withdraw from the research, you are free to withdraw at any time without any consequences. Please contact us by email to inform us of your withdrawal:

Kamila Heusi Fourteau – kamilaheusi@gmail.com

Professor Dr. ª Mailce Borges Mota – mailce.mota@ufsc.br

APPENDIX N – TCLE IN ENGLISH

LabLing | Laboratório da Linguagem e Processos Cognitivos

FREE AND INFORMED CONSENT FORM (TCLE)

UFSC PPGI LabLing | Laboratório da Linguagem e Processos Cognitivos

UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

FREE AND INFORMED CONSENT FORM (TCLE)

Based on Resolution 510/2016 from CNS (Conselho Nacional de Saúde) and Circular Letter Nº 2/2021/CONEP/SECNS/MS and Nº 23/2022/CONEP/SECNS/DGIP/SE/MS

RESEARCH PROJECT: INVESTIGATING CROSSLINGUISTIC INFLUENCE IN ENGLISH

Dear participant,

My name is Kamila Heusi Fourteau, I am a master student at the *Programa de Pós-Graduação em Inglês: Estudos Linguisticos e Literários* from *Universidade Federal de Santa Catarina (UFSC)*, in Brazil. My advisor is Professor Dr. ª Mailce Borges Mota from *UFSC*. We are conducting a study to investigate crosslinguistic influence in English. This research investigates crosslinguistic influence between English, Brazilian Portuguese and Spanish. We would like to invite you to participate in the selection of the sentences in English that we will use in our experiment. We will not analyse your individual responses or perform statistical tests on them. We just want to make sure our sentences sound natural to native speakers. Participation in the research is voluntary and unpaid, as required by the Brazilian law. Below we provide more information about the study we are conducting.

1- AIM OF THE RESEARCH:

The aim of our study is to investigate the influence of Spanish and Brazilian Portuguese in visual word recognition in English.

2- YOUR TASK:

If you agree to participate in this study, you will be presented with a series of sentences in English. Your task is to judge how acceptable each sentence sounds to you as a native speaker. You will use a 5-point scale, where 1 means the sentence sounds completely unnatural to you, and 5 means that it sounds completely natural. This should take around 30 minutes.

3- RISKS:

While judging the sentences, you may feel tired, uncomfortable, embarrassed, upset, bored or nervous. If this occurs, please let us know immediately. To minimise the risks described above, we recommend you perform the task in a comfortable and silent place that offers optimal conditions regarding lighting, temperature, and proper ergonomics. In addition, you may stop to rest and hydrate during the activities. Also, since the task will be performed on Google forms, there are risks such as unauthorized access to your data, accidental data breaches or loss, tracking of your online activity, interception of information during online communication. To minimise these risks we will download the results of your task immediately after completion. Also, you will not be asked to give any personal information besides confirming you are 18 years old or older and your level of education. You may also withdraw from this study at any time, without any consequences for you. Furthermore, if any incident or injury occurs due to your participation in this research, let us know immediately. You have the right to request compensation if you suffer harm due to your participation in this research. You are entitled to reimbursement in case of expenses from your participation in this research. However, as explained previously, the participation in the research is voluntary and unpaid as required by the Brazilian law.

4- BENEFITS:

Participating in this research does not offer you any direct benefits, but your participation contributes to the Brazilian science, as this research can help us to understand how the languages we know interact in the mind when we read a word in English.

5- PRIVACY AND DATA CONFIDENTIALITY:

Your identity will never be disclosed. You will receive an identification code (for example, P2025703) to protect your identity and ensure your anonymous participation in this research. However, the breach of confidentiality of data and unlock privacy must be considered, even if involuntary and unintentional. This may have some consequences for you, but our methodological procedures are organized to prevent them. For example, your responses will be accessed only by my advisor and I and will be stored anonymously on a device accessible only by us through the use of our password at *LabLing/UFSC*.

We will strictly follow the *Lei Geral de Proteção de Dados,* the Data Protection Law nº 13.709/2018 regarding the processing of personal data in Brazil. Therefore, your data will not be stored on virtual platforms, shared environments or "clouds", preventing unwanted people from having access to them. The results of this research will be disclosed in events or scientific publications without sharing your identification. You can access the results of this research at any time by contacting us.

6- PRE-REGISTRATION OF THE STUDY

The study on crosslinguistic influence in English is pre-registered on the Open Science Framework (OSF) platform, with the aim of ensuring methodological rigor and increasing the reliability and transparency of this research. This means that some information regarding the study, such as its objective, research questions, nature and design of the study, data collection procedures, and variables to be measured and analysed will be publicly available on the platform. However, your responses will not be shared since they will be used to help us make sure our sentences sound natural in English. We will only share our final sentences.

We, the researchers, will comply with all ethical precepts implied in research involving human beings in all phases of the research, as regulated by the Resolution 510/2016 from CNS (Conselho Nacional de Saúde), which establishes the standards applicable to research in the Humanities and Social Sciences in Brazil. We, the researchers, also adhere to the Resolution 510/2016 and undertake to conduct the research in accordance with the resolution.

7- CONTACTS:

If you have any questions about the research, you can contact Kamila Heusi Fourteau by email kamilaheusi@gmail.com or by phone +5547999073127, or Dr. ª Mailce Borges Mota by email mailce.mota@ufsc.br, phone +55483721-3792, or at the *Centro de Comunicação e Expressão* building – CCE, block B, room 513, *Universidade Federal de Santa Catarina, UFSC,* Brazil.

8- ETHICS COMMITTEE:

This research was evaluated and approved by the *Comitê de Ética em Pesquisa com Seres Humanos (CEPSH),* the ethics committee from *UFSC. CEPSH* is an interdisciplinary, deliberative, consultative and educational collegiate, linked to the *UFSC*, but independent in decision-making, created to defend the interests from participants of the research in their integrity and dignity and to contribute to the development of research within ethical standards. If you have any questions or complaints regarding the ethical conduct of this research, you can contact *CEPSH – UFSC*. Address: *Prédio da Reitoria II*, 7th floor, room 701, *Rua Desembargador Vitor Lima, nº222, Trindade, CEP 88040-400, Florianópolis-SC.* Telephone: +55483721-6094. E-mail: cep.propesq@contato.ufsc.br. As stated above, you are free to withdraw your consent to participate at any time, without any consequences for you. If you decide to participate and then wish to withdraw from the research, that is okay, and you do not need to justify your withdrawal in the research. If you wish to inform us of your withdrawal, please contact the researchers by phone or email. But that is only if you want to!

After choosing an option below and marking your choice, you will receive this TCLE in your email account. Please keep the TCLE with you because the TCLE provides important details about the research.

Do you agree to participate as a volunteer in the research "Investigating the crosslinguistic influence in English"?

- ◯ I agree to participate in the research.
- ◯ I do not agree to participate in the research.

Submit

Page 1 of 1

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APPENDIX O – THE MEANING RECOGNITION TASK

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LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TAREFA DE RECONHECIMENTO DE SIGNIFICADO

Código de identificação do participante:_____ Data de hoje: _____

Assinale o significado em português das palavras em inglês apresentadas abaixo:

1- ACTOR

( ) jornalista ( ) ator ( ) bombeiro ( ) cientista

2- MAYOR

( ) prefeito ( ) tradutor ( ) presidente ( ) vendedor

3- FRUIT

( ) pastel ( ) churrasco ( ) empadão ( ) fruta

4- PEACH

( ) abacaxi ( ) uva ( ) pêssego ( ) mamão

5- PAPER

( ) papel ( ) caderno ( ) agenda ( ) periódico

6- DRAFT

( ) espiral ( ) rascunho ( ) artigo ( ) brochura

7- PIANO

( ) pandeiro ( ) bandolim ( ) piano ( ) bateria

8- SPOON

( ) tábua ( ) ralador ( ) espátula ( ) colher

9- DENTIST

( ) zelador ( ) dentista ( ) biólogo ( ) astronauta

10- NURSERY

( ) creche ( ) padaria ( ) sorveteria ( ) lanchonete

11- ANIMAL

( ) animal ( ) fruta ( ) cor ( ) salada

12- PIGEON

( ) papagaio ( ) pombo ( ) pássaro ( ) morcego

13- CAMERA

( ) relógio ( ) telefone ( ) impressora ( ) câmera

14- GLOVES

( ) luvas ( ) cobertor ( ) boné ( ) chinelo

15- MAP

( ) geografia ( ) relevo ( ) continente ( ) mapa

16- HAM

( ) queijo ( ) requeijão ( ) manteiga ( ) presunto

17- GUITAR

( ) saxofone ( ) guitarra ( ) sanfona ( ) gaita

18- STREET

( ) cidade ( ) estado ( ) rua ( ) bairro

19- RADIO

( ) rádio ( ) batedeira ( ) cafeteira ( ) televisão

20- ELBOW

( ) boca ( ) olhos ( ) corpo ( ) cotovelo

21- HOTEL

( ) casa ( ) farmácia ( ) hotel ( ) festa

22- ALLEY

( ) apartamento ( ) prédio ( ) beco ( ) cidade

23- BASE

( ) corredor ( ) base ( ) rua ( ) vitrine

24- CORN

( ) arroz ( ) coxinha ( ) brigadeiro ( ) milho

25- ECHO

( ) eco ( ) tela ( ) sonho ( ) pesadelo

26- DOVE

( ) águia ( ) corvo ( ) cisne ( ) pomba

27- PACT

( ) reunião ( ) pacto ( ) compromisso ( ) calendário

28- KNEE

( ) cabeça ( ) joelho ( ) pé ( ) mão

29- POEM

( ) poema ( ) livro ( ) revista ( ) artigo

30- PLUM

( ) laranja ( ) ameixa ( ) melão ( ) goiaba

31- RAT

( ) coelho ( ) girafa ( ) pássaro ( ) rato

32- OWL

( ) tucano ( ) hipopótamo ( ) coruja ( ) elefante

33- ALIBI

( ) tio ( ) vizinho ( ) família ( ) álibi

34- SCARF

( ) chapéu ( ) cachecol ( ) blusa ( ) camiseta

35- BABYSITTER

( ) atleta ( ) babá ( ) psicólogo ( ) pedreiro

36- WATERMELON

( ) melancia ( ) acerola ( ) maracujá ( ) kiwi

37- BALLOON

( ) escada ( ) corredor ( ) balão ( ) brinquedo

38- GARBAGE

( ) varanda ( ) lixo ( ) elevador ( ) rede

39- BLACKOUT

( ) blecaute ( ) céu ( ) dia ( ) estrela

40- SIDEWALK

( ) mercado ( ) avião ( ) bairro ( ) calçada

41- CARPET

( ) sofá ( ) cozinha ( ) apartamento ( ) tapete

42- HELMET

( ) semáforo ( ) trânsito ( ) capacete ( ) carro

43- ACCURACY

( ) prova ( ) acurácia ( ) tristeza ( ) errado

44- TROUSERS

( ) tênis ( ) anel ( ) calça ( ) casaco

45- DISCOMFORT

( ) desconforto ( ) honesto ( ) lindo ( ) cruel

46- STRAWBERRY

( ) manga ( ) pitaya ( ) açaí ( ) morango

47- FACT

( ) amor ( ) fato ( ) esperança ( ) raiva

48- GUFF

( ) justiça ( ) bobagem ( ) ilusão ( ) pensamento

49- FUNNEL

( ) funil ( ) garrafa ( ) copo ( ) prato

50- WINDOW

( ) geladeira ( ) cadeira ( ) porta ( ) janela

51- GRASS

( ) árvore ( ) portão ( ) grama ( ) flor

52- DRILL

( ) martelo ( ) escada ( ) furadeira ( ) balde

53- HANDBALL

( ) handebol ( ) quadra ( ) time ( ) golfe

54- BATHROBE

( ) cortina ( ) mala ( ) roupão ( ) toalha

55- LAPEL

( ) meias ( ) lapela ( ) bermuda ( ) touca

56- THIGH

( ) nariz ( ) orelha ( ) cabelo ( ) coxa

57- LINK

( ) link ( ) alegria ( ) texto ( ) atividade

58- OVERDOSE

( ) doença ( ) overdose ( ) fuga ( ) amizade

59- SQUIRREL

( ) esquilo ( ) galinha ( ) sapo ( ) crocodilo

60- POT

( ) espremedor ( ) ralador ( ) pia ( ) pote

61- FOX

( ) tigre ( ) ovelha ( ) pato ( ) raposa

62- MARSHMALLOW

( ) picolé ( ) paçoca ( ) marshmallow ( ) salgadinho

63- POMEGRANATE

( ) limão ( ) romã ( ) caju ( ) amora

64- BOTTLE

( ) pano ( ) guardanapo ( ) esponja ( ) garrafa

65- BUBBLE

( ) bolha ( ) forma ( ) ralo ( ) jarra

66- CHAYOTE
( ) berinjela ( ) espinafre ( ) chuchu ( ) alho

67- PUMPKIN
( ) cebola ( ) abóbora ( ) batata ( ) pepino

68- TRAM
( ) bicicleta ( ) carro ( ) patinete ( ) bonde

69- WORM
( ) joaninha ( ) minhoca ( ) cigarra ( ) pulga

70- DOLPHIN
( ) baleia ( ) golfinho ( ) tubarão ( ) tartaruga

71- BUZZARD
( ) cavalo ( ) peixe ( ) urubu ( ) morcego

72- GECKO
( ) lagartixa ( ) borboleta ( ) formiga ( ) porco

73- SCREW
( ) tijolo ( ) ferro ( ) parafuso ( ) régua

74- ISLANDER
( ) piscina ( ) areia ( ) nuvem ( ) ilheú

75- CONCIERGE
( ) vendedor ( ) porteiro ( ) músico ( ) modelo

76- EARTHWORM
( ) mosca ( ) grilo ( ) minhoca ( ) jacaré

77- LETTUCE
( ) alface ( ) couve-flor ( ) rúcula ( ) couve

78- PANTS
( ) vestido ( ) colar ( ) carteira ( ) calça

79- SKIRT
( ) cinto ( ) moletom ( ) saia ( ) gravata

80- PLUMBER

( ) barbeiro ( ) encanador ( ) garçom ( ) cozinheiro

81- DAYCARE

( ) hospital ( ) creche ( ) igreja ( ) universidade

82- REPLACEMENT

( ) comunicação ( ) paz ( ) funcionário ( ) substituição

83- SEASONED

( ) escuro ( ) bandeja ( ) temperado ( ) frio

84- ZUCCHINI

( ) abobrinha ( ) tomate ( ) espinafre ( ) azeitonas

85- SESAME

( ) sal ( ) pimenta ( ) gergelim ( ) molho

86- PEANUT

( ) amendoim ( ) pão ( ) sorvete ( ) bolacha

87- TEA

( ) suco ( ) café ( ) água ( ) chá

88- PAN

( ) fogão ( ) xícara ( ) frigideira ( ) cafeteira

89- TRAP

( ) cansaço ( ) armadilha ( ) presença ( ) força

90- BOWL

( ) taça ( ) tigela ( ) garfo ( ) talher

91- COCKROACH

( ) abelha ( ) gato ( ) barata ( ) leão

APPENDIX P – INVITATION FOR PARTICIPANTS

UNIVERSIDADE FEDERAL DE SANTA CATARINA PPGI LabLing fapesc Fundação de Amparo à Pesquisa e Inovação do Estado de Santa Catarina

¡HOLA!

Gostaríamos de convidar você para participar da nossa pesquisa sobre falantes multilíngues como você! A pesquisa vai ser feita na sua escola. Para participar você fará três tarefas no papel e uma tarefa no computador.

Se você quiser participar é necessário que seus pais e/ou responsáveis autorizem o Termo de Consentimento anexado a este convite. Caso você tenha 18 anos ou mais, você tem autonomia para decidir sobre a sua participação. Você mesmo pode assinar um Termo de Consentimento, que elaboramos para a sua faixa etária.

El Formulario de Consentimiento está disponible en portugués y en español. Después de que tú o tus responsables hayáis tomado una decisión, **trae el documento original firmado. Puedes quedarte el duplicado.**

Atención: La participación en la investigación es **voluntaria y no remunerada**. **No se te cobrará** ninguna cantidad por participar.

Por favor, qualquer dúvida seus pais ou responsáveis podem entrar em contato com a mestranda Kamila pelo e-mail kamilaheusi@gmail.com ou pelo whatsapp (47) 999073127.

Você também pode falar com a mestranda Kamila pessoalmente na sua escola no(s) dia(s) _____ às _____.

*O estudo obteve autorização do Comitê de Ética em Pesquisa (CEPSH) da Universidade Federal de Santa Catarina (UFSC) sob o CAAE 87651825.7.0000.0121.

SE VOCÊ QUISER CONVERSAR COM A GENTE,
ESTAREMOS ESPERANDO POR VOCÊ!

Prof.ª Dr.ª Mailce e Mestranda Kamila

APPENDIX Q – TCLE FOR THE PARENTAL FIGURE IN BRAZILIAN PORTUGUESE



UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO – TCLE

Baseado na Resolução 510/16 do CNS (Conselho Nacional de Saúde)

PROJETO DE PESQUISA: INVESTIGANDO A INFLUÊNCIA TRANSLINGUÍSTICA NO INGLÊS

Srs. Pais ou Responsáveis,

Meu nome é Kamila Heusi Fourteau e sou mestranda no Programa de Pós-Graduação em Inglês: Estudos Linguísticos e Literários (PPGI) da Universidade Federal de Santa Catarina (UFSC), sob orientação da Prof.ª Dr.ª Mailce Borges Mota. Gostaríamos de solicitar sua autorização para convidar seu (sua) filho(a) a participar da nossa pesquisa sobre a influência do espanhol e do português brasileiro no inglês. A participação na pesquisa é voluntária e não remunerada. Nenhum valor será cobrado para seu(sua) filho(a) participar dessa pesquisa. Gostaríamos muito de contar com a participação do(a) seu (sua) filho(a) neste estudo para entender melhor como multilíngues, como seu(sua) filho(a), reconhecem palavras em inglês. Antes do(a) Sr.(ª) decidir, por favor leia abaixo as informações sobre a pesquisa.

1- OBJETIVO DA PESQUISA:

O objetivo dessa pesquisa é investigar a influência do espanhol e do português brasileiro no reconhecimento visual de palavras em inglês.

2- ATIVIDADES:

Seu(sua) filho(a) será solicitado(a) a realizar as seguintes atividades:

A- Questionário de experiência linguística e proficiência: Nesta primeira atividade, solicitaremos que o(a) seu(sua) filho(a) responda um questionário com perguntas sobre seus idiomas, os países em que morou, as culturas com que se identifica, a turma em que estuda, as dificuldades que possui, a alternância das línguas que utiliza, o fator socioeconômico da família. Nenhuma pergunta do questionário será obrigatória e o(a) seu(sua) filho(a) terá o direito de não responder qualquer questão, sem necessidade de explicação ou justificativa. Esta atividade será feita no papel. O tempo estimado para a realização dessa tarefa é de 30 minutos.

B- Tarefa de proficiência: A segunda atividade será uma tarefa que avalia a proficiência do(a) seu(sua) filho(a) em inglês. A atividade consiste em relacionar palavras e/ou frases em inglês com outras palavras em inglês. Esta atividade será feita no papel. O tempo estimado para a realização dessa tarefa é de 10 a 20 minutos.

C- Tarefa de leitura automonitorada: Na terceira atividade, solicitaremos que o(a) seu(sua) filho(a) realize uma tarefa no computador. Nessa tarefa, o(a) seu(sua) filho(a) lerá frases em inglês silenciosamente. As palavras da frase aparecerão uma por vez na tela do computador. Ao ver uma palavra, o(a) seu(sua) filho(a) pressionará a barra de espaço do computador para passar a próxima palavra, até chegar ao final da frase. Antes de começar, o (a) seu(sua) filho(a) pode fazer um treinamento para se familiarizar com a tarefa. O tempo estimado para a realização dessa tarefa é de 20 a 30 minutos.

D- Tarefa de reconhecimento de significado: Na quarta atividade, solicitaremos que o (a) seu(sua) filho(a) realize uma tarefa de reconhecimento de significado. Nessa tarefa, que será feita no papel, o(a) seu(sua) filho(a) reconhecerá palavras e/ou figuras e escreverá o significado delas. O tempo estimado para a realização dessa tarefa é de 10 minutos.

3- COLETA DE DADOS:

A coleta de dados será realizada em uma sala disponibilizada pela escola que seu(sua) filho(a) está matriculado(a). As atividades terão duração de aproximadamente 1h30min. Se seu(sua) filho(a) não realizar bem alguma tarefa, ele(a) não será prejudicado (a) e não sofrerá nenhuma punição na pesquisa e nem na escola onde estuda. Faremos as atividades em um único dia no turno em que seu(sua) filho(a) está matriculado(a). O horário específico para a realização das tarefas dependerá da organização da escola e do que for melhor para seu(sua) filho(a). Por isso, as atividades podem ser realizadas em dois dias e/ou no contraturno escolar. O(A) Sr.(ª) e seu(sua) filho(a) têm direito a ressarcimento no caso de despesa decorrente da participação do(a) seu(sua) filho(a) nesta pesquisa.

4- RISCOS:

Como em toda pesquisa científica, a realização destas atividades pode causar algum nervosismo, aborrecimento, constrangimento, desconforto, tédio, nervosismo ou cansaço físico para seu(sua) filho(a). Se isso ocorrer, seu(sua) filho(a) deve nos avisar imediatamente. Para evitar e minimizar o cansaço, será programado um intervalo de cinco a dez minutos após a tarefa de proficiência, antes da tarefa de leitura automonitorada. Além disso, seu(sua) filho(a) pode parar para descanso e hidratação durante as atividades. Ressaltamos que seu(sua) filho(a) pode desistir a qualquer momento da pesquisa, sem prejuízo de qualquer natureza para ele(ela). Se ocorrer alguma intercorrência ou dano, seu(sua) filho(a) receberá todo o atendimento necessário. O(A) Sr.(ª) e seu(sua) filho(a) têm direito a solicitar indenização, se tiverem prejuízos por causa da participação do(a) seu(sua) filho(a) nesta pesquisa.

5- BENEFÍCIOS:

Participar da pesquisa não oferece benefícios direto ao seu(sua) filho(a), mas a participação do seu(sua) filho(a) contribui para a ciência brasileira, pois a presente pesquisa pode ajudar a entender como as línguas que sabemos interagem na mente quando lemos uma palavra.

6- PRIVACIDADE DO PARTICIPANTE E SIGILO DOS DADOS:

A identidade do seu(sua) filho(a) nunca será divulgada. Seu(sua) filho(a) receberá um código de identificação (exemplo P2025703) para preservar a identidade dele(a) e garantir a participação anônima na pesquisa. A identidade do(a) seu(sua) filho(a) será registrada somente neste Termo de Consentimento e no Termo de Assentimento. Entretanto, a quebra de sigilo dos dados e de sua privacidade deve ser considerada, ainda que involuntária e não intencional. Isto pode trazer alguma consequência para o(a) Sr.(ª) ou seu(sua) filho(filha), mas nossos procedimentos metodológicos estão organizados de modo a evitar ao máximo que esta possibilidade ocorra. Como medida de precaução, por exemplo, os dados serão acessados somente pelas pesquisadoras, todo material em papel será guardado em armários com chave no LabLing/UFSC e os dados ficarão armazenados anonimamente em um dispositivo acessível apenas pelas pesquisadoras mediante senha pessoal. Além disso, para evitar que outras pessoas acessem os dados durante as atividades, elas serão realizadas individualmente com os participantes.

Seguiremos rigorosamente a Lei Geral de Proteção de Dados (Lei nº 13.709, de 14 de agosto de 2018) quanto ao tratamento de dados pessoais. Por isso, os dados do seu(sua) filho(a)

não serão armazenados em plataformas virtuais, ambientes compartilhados ou "nuvens", evitando que pessoas indesejadas tenham acesso a eles. Para publicação em repositório *online* utilizaremos códigos em vez do nome do seu(sua) filho(a) (por exemplo, P2025703) para identificar os dados numéricos. Os resultados desta pesquisa serão divulgados em eventos ou publicações científicas sem qualquer identificação dos participantes. Os dados do(a) seu(sua) filho(a) serão codificados e serão analisados em conjunto com os dados de outros participantes, sem qualquer identificação pessoal. O(A) Sr.(ª) pode ter acesso aos resultados da pesquisa a qualquer momento, entrando em contato com as pesquisadoras.

7- PRÉ-REGISTRO DO ESTUDO

Este estudo está pré-registrado na plataforma *Open Science Framework* (OSF), com o objetivo de assegurar o rigor metodológico e aumentar a confiabilidade e transparência da pesquisa. Isso significa que algumas informações, como o seu objetivo, as perguntas de pesquisa, a natureza e o desenho do estudo, os procedimentos de coleta de dados, as variáveis a serem medidas e analisadas e o plano de análise qualitativa estarão disponíveis de maneira pública na internet. Nenhum dado pessoal seu ou do(a) seu(sua) filho(a) será publicado. Como explicado anteriormente, a anonimização é garantida pelo código de identificação (exemplo P2025703) também nesta plataforma.

Os procedimentos metodológicos adotados obedecem aos preceitos éticos implicados em pesquisas envolvendo seres humanos, conforme normatizado pela Resolução do Conselho Nacional de Saúde nº 510, de 07 de abril de 2016, que dispõe sobre as normas aplicáveis a pesquisas em Ciências Humanas e Sociais. As pesquisadoras também aderem a esse documento e comprometem-se a conduzir a pesquisa de acordo com o que preconiza a referida Resolução.

8- CONTATOS:

Tendo qualquer dúvida sobre a pesquisa, o(a) Sr.(ª) pode entrar em contato com a mestranda Kamila Heusi Fourteau, pelo e-mail kamilaheusi@gmail.com ou pelo telefone (47) 999073127, ou com a Prof.ª Dr.ª Mailce Borges Mota através do e-mail mailce.mota@ufsc.br, telefone (48) 3721-3792, ou no prédio do Centro de Comunicação e Expressão – CCE, bloco B, sala 513, Universidade Federal de Santa Catarina, UFSC.

9- COMITÊ DE ÉTICA EM PESQUISA (CEP):

Esta pesquisa foi avaliada e aprovada pelo Comitê de Ética em Pesquisa com Seres Humanos (CEPSH) da UFSC. O CEPSH é um órgão colegiado interdisciplinar, deliberativo,

consultivo e educativo, vinculado à Universidade Federal de Santa Catarina, mas independente na tomada de decisões, criado para defender os interesses dos participantes da pesquisa em sua integridade e dignidade e para contribuir para o desenvolvimento da pesquisa dentro de padrões éticos. Caso o(a) Sr.(ª) tenha alguma dúvida ou reclamação quanto à condução ética dessa pesquisa, o(a) Sr.(ª) pode entrar em contato com o CEPSH – UFSC. Endereço: Prédio da Reitoria II, 7º andar, sala 701, Rua Desembargador Vitor Lima, nº 222, Trindade, CEP 88040-400, Florianópolis-SC. Telefone: (48) 3721-6094. E-mail: cep.propesq@contato.ufsc.br.

Como informado acima, a liberdade de retirada de consentimento da participação do(a) seu(sua) filho(a) é garantida a qualquer momento, sem qualquer prejuízo ou punição. A retirada pode ser solicitada diretamente com as pesquisadoras, por telefone, e-mail ou pessoalmente com as pesquisadoras na escola do seu filho.

Este documento será assinado em duas vias. Após escolher uma opção abaixo e assinalar a sua escolha, uma via deve ser entregue para as pesquisadoras, independentemente da escolha, e a outra via permanecerá na posse do(a) responsável, que deve guardá-la.

Por favor escolha uma das opções:

( ) Concordo voluntariamente em permitir a participação do(a) meu(minha) filho(a) na pesquisa **INVESTIGANDO A INFLUÊNCIA TRANSLINGUÍSTICA NO INGLÊS.**

( ) Eu não autorizo meu filho(a) a participar da pesquisa.

_____ _____

Nome do responsável Assinatura do responsável

_____

Nome do(a) menor

_____ _____

Nome da mestranda Assinatura da mestranda

_____ _____

Nome da pesquisadora responsável Assinatura da pesquisadora responsável

Local: Florianópolis (SC)

DATA: _____/_____/_____

APPENDIX R – TCLE FOR THE PARENTAL FIGURE IN SPANISH



UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TÉRMINO DE CONSENTIMIENTO INFORMADO – TCLE

Basado en la Resolución 510/16 del CNS (Consejo Nacional de Salud)

PROYECTO DE INVESTIGACIÓN: INVESTIGANDO LA INFLUENCIA TRANSLINGÜÍSTICA EN INGLÉS

Estimados padres o tutores,

Mi nombre es Kamila Heusi Fourteau y soy estudiante de maestría en el Programa de Posgrado en Inglés: Estudios Lingüísticos y Literarios (PPGI) de la Universidad Federal de Santa Catarina (UFSC), bajo la dirección de la Prof.ª Dra. Mailce Borges Mota. Nos gustaría solicitar su autorización para invitar a su hijo(a) a participar en nuestra investigación sobre la influencia del español y del portugués brasileño en el inglés. La participación en la investigación es voluntaria y no remunerada. No se cobrará ningún valor por la participación de su hijo(a) en esta investigación. Nos encantaría contar con la participación de su hijo(a) en este estudio para entender mejor cómo los multilingües, como su hijo(a), reconocen palabras en inglés. Antes de que decida, por favor lea a continuación la información sobre la investigación.

1- OBJETIVO DE LA INVESTIGACIÓN:

El objetivo de esta investigación es investigar la influencia del español y del portugués brasileño en el reconocimiento visual de palabras en inglés.

2- ACTIVIDADES:

Se solicitará a su hijo(a) realizar las siguientes actividades:

A- Cuestionario de experiencia lingüística y competencia: En esta primera actividad, le solicitaremos a su hijo(a) que responda un cuestionario con preguntas sobre sus idiomas, los países donde ha vivido, las culturas con las que se identifica, el grupo en el que estudia, las dificultades que tiene, el cambio de lenguas que utiliza, el factor socioeconómico de la familia. Ninguna pregunta del cuestionario será obligatoria y su hijo(a) tendrá el derecho de no responder cualquier pregunta, sin necesidad de explicación o justificación. Esta actividad será realizada en papel. El tiempo estimado para realizar esta tarea es de 30 minutos.

B- Tarea de competencia: La segunda actividad será una tarea que evalúa la competencia de su hijo(a) en inglés. La actividad consiste en relacionar palabras y/o frases en inglés con otras palabras en inglés. Esta actividad será realizada en papel. El tiempo estimado para realizar esta tarea es de 10 a 20 minutos.

C- Tarea de lectura autoadministrada: En la tercera actividad, solicitaremos a su hijo(a) que realice una tarea en el computador. En esta tarea, su hijo(a) leerá frases en inglés en silencio. Las palabras de la frase aparecerán una por una en la pantalla del computador. Al ver una palabra, su hijo(a) presionará la barra de espacio del computador para pasar a la siguiente palabra, hasta llegar al final de la frase. Antes de comenzar, su hijo(a) podrá hacer un entrenamiento para familiarizarse con la tarea. El tiempo estimado para realizar esta tarea es de 20 a 30 minutos.

D- Tarea de reconocimiento de significado: En la cuarta actividad, le solicitaremos a su hijo(a) que realice una tarea de reconocimiento de significado. En esta tarea, que se realizará en papel, su hijo(a) reconocerá palabras y/o imágenes y escribirá su significado. El tiempo estimado para realizar esta tarea es de 10 minutos.

3- COLECCIÓN DE DATOS:

La recolección de datos se realizará en una sala proporcionada por la escuela a la que asiste su hijo(a). Las actividades tendrán una duración de aproximadamente 1h 30min. Si su hijo(a) no realiza bien alguna tarea, no será perjudicado y no sufrirá ninguna sanción en la investigación ni en la escuela donde estudia. Realizaremos las actividades en un solo día en el turno en el que su hijo(a) está matriculado(a). El horario específico para la realización de las tareas dependerá de la organización de la escuela y de lo que sea más conveniente para su hijo(a). Por lo tanto, las actividades pueden realizarse en dos días y/o en el turno contrario al escolar. Usted y su hijo(a) tienen derecho a un reembolso en caso de gastos derivados de la participación de su hijo(a) en esta investigación.

4- RIESGOS:

Como en toda investigación científica, la realización de estas actividades puede generar algo de nerviosismo, incomodidad, vergüenza, cansancio o fatiga física para su hijo(a). Si esto ocurre, su hijo(a) debe notificarnos inmediatamente. Para evitar y minimizar la fatiga, se programará un descanso de cinco a diez minutos después de la tarea de competencia, antes de la tarea de lectura autoadministrada. Además, su hijo(a) podrá hacer pausas para descansar e hidratarse durante las actividades. Resaltamos que su hijo(a) puede desistir en cualquier momento de la investigación, sin perjuicio de ningún tipo para él/ella. Si ocurre alguna emergencia o daño, su hijo(a) recibirá toda la atención necesaria. Usted y su hijo(a) tienen derecho a solicitar una indemnización si tienen perjuicios derivados de la participación de su hijo(a) en esta investigación.

5- BENEFICIOS:

Participar en la investigación no ofrece beneficios directos para su hijo(a), pero la participación de su hijo(a) contribuye a la ciencia brasileña, ya que esta investigación puede ayudar a entender cómo las lenguas que conocemos interactúan en la mente cuando leemos una palabra.

6- PRIVACIDAD DEL PARTICIPANTE Y CONFIDENCIALIDAD DE LOS DATOS:

La identidad de su hijo(a) nunca será divulgada. Su hijo(a) recibirá un código de identificación (ejemplo P2025703) para preservar su identidad y garantizar la participación anónima en la investigación. La identidad de su hijo(a) solo será registrada en este Término de Consentimiento y en el Término de Asentimiento. Sin embargo, la violación de la confidencialidad de los datos y de su privacidad debe ser considerada, aunque involuntaria y no intencional. Esto podría traer algunas consecuencias para usted o su hijo(a), pero nuestros procedimientos metodológicos están organizados para evitar que esto ocurra en la mayor medida posible. Como medida de precaución, por ejemplo, los datos serán accesibles únicamente por las investigadoras, todo material en papel será guardado en armarios con llave en el LabLing/UFSC y los datos serán almacenados de forma anónima en un dispositivo accesible solo por las investigadoras mediante contraseña personal. Además, para evitar que otras personas accedan a los datos durante las actividades, estas se realizarán de forma individual con los participantes.

Cumpliremos rigurosamente con la Ley General de Protección de Datos (Ley N.º 13.709, de 14 de agosto de 2018) en cuanto al tratamiento de datos personales. Por lo tanto, los datos de su hijo(a) no serán almacenados en plataformas virtuales, ambientes compartidos o "nubes", evitando que personas no deseadas tengan acceso a ellos. Para la publicación en repositorios en línea, utilizaremos códigos en lugar del nombre de su hijo(a) (por ejemplo, P2025703) para identificar los datos numéricos. Los resultados de esta investigación se divulgarán en eventos o publicaciones científicas sin ninguna identificación de los participantes. Los datos de su hijo(a) serán codificados y se analizarán junto con los datos de otros participantes, sin ninguna identificación personal. Usted puede acceder a los resultados de la investigación en cualquier momento poniéndose en contacto con las investigadoras.

7- PRE-REGISTRO DEL ESTUDIO

Este estudio está pre-registrado en la plataforma Open Science Framework (OSF), con el objetivo de asegurar el rigor metodológico y aumentar la fiabilidad y transparencia de la investigación. Esto significa que algunas informaciones, como el objetivo, las preguntas de investigación, la naturaleza y el diseño del estudio, los procedimientos de recolección de datos, las variables a medir y analizar y el plan de análisis cualitativo estarán disponibles públicamente en internet. Ningún dato personal suyo ni de su hijo(a) será publicado. Como se explicó anteriormente, la anonimización está garantizada mediante el código de identificación (ejemplo P2025703) también en esta plataforma.

Los procedimientos metodológicos adoptados cumplen con los principios éticos implicados en investigaciones con seres humanos, según lo establecido por la Resolución del Consejo Nacional de Salud N.º 510 de 07 de abril de 2016, que establece las normas aplicables a investigaciones en Ciencias Humanas y Sociales. Las investigadoras también se adhieren a este documento y se comprometen a llevar a cabo la investigación de acuerdo con lo que establece dicha Resolución.

8- CONTACTOS:

Si tiene alguna duda sobre la investigación, puede ponerse en contacto con la estudiante de maestría Kamila Heusi Fourteau al correo electrónico kamilaheusi@gmail.com o al teléfono (47) 999073127, o con la Prof.ª Dra. Mailce Borges Mota a través del correo electrónico mailce.mota@ufsc.br, teléfono (48) 3721-3792, o en el edificio del Centro de Comunicación y Expresión – CCE, bloque B, sala 513, Universidad Federal de Santa Catarina, UFSC.

9- COMITÉ DE ÉTICA EN INVESTIGACIÓN (CEI):

Esta investigación fue evaluada y aprobada por el Comité de Ética en Investigación con Seres Humanos (CEPSH) de la UFSC. El CEPSH es un órgano colegiado interdisciplinario, deliberativo, consultivo y educativo, vinculado a la Universidad Federal de Santa Catarina, pero independiente en la toma de decisiones, creado para defender los intereses de los participantes de la investigación en su integridad y dignidad y para contribuir al desarrollo de la investigación dentro de los estándares éticos. Si tiene alguna duda o queja sobre la ética de esta investigación, puede ponerse en contacto con el CEPSH – UFSC. Dirección: Edificio de la Rectoría II, 7º piso, sala 701, Calle Desembargador Vitor Lima, Nº222, Trindade, CEP 88040-400, Florianópolis-SC. Teléfono: (48) 3721-6094. Correo electrónico: cep.propesq@contato.ufsc.br.

Como se informó anteriormente, la libertad para retirar el consentimiento de participación de su hijo(a) está garantizada en cualquier momento, sin perjuicio o sanción. La retirada puede solicitarse directamente a las investigadoras, por teléfono, correo electrónico o personalmente en la escuela de su hijo.

Después de elegir una opción abajo y marcar tu elección, trae el documento original firmado a las investigadoras. Puedes quedarte el duplicado.

Por favor, elija una de las opciones:

( ) Estoy de acuerdo voluntariamente en permitir la participación de mi hijo(a) en la investigación **INVESTIGANDO LA INFLUENCIA TRANSLINGÜÍSTICA EN INGLÉS.**

( ) No autorizo a mi hijo(a) a participar en la investigación.

_____	_____
Nombre del responsable	Firma del responsable
_____	
Nombre del menor	
_____	_____
Nombre de la estudiante de maestría	Firma de la estudiante de maestría
_____	_____
Nombre de la investigadora responsable	Firma de la investigadora responsable

Lugar: Florianópolis (SC)

Fecha: _____/_____/_____

APPENDIX S – TALE IN BRAZILIAN PORTUGUESE







UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TERMO DE ASSENTIMENTO LIVRE E ESCLARECIDO – TALE

Baseado na Resolução 510/16 do CNS (Conselho Nacional de Saúde)

PROJETO DE PESQUISA: INVESTIGANDO A INFLUÊNCIA TRANSLINGUÍSTICA NO INGLÊS

Olá,

Meu nome é Kamila Heusi Fourteau e sou mestranda no Programa de Pós-Graduação em Inglês: Estudos Linguísticos e Literários (PPGI) da Universidade Federal de Santa Catarina (UFSC), sob orientação da Prof.ª Dr.ª Mailce Borges Mota. Gostaríamos de convidar você para participar da nossa pesquisa sobre a influência do espanhol e do português brasileiro no inglês. Seus pais e/ou responsáveis permitiram que você participasse da nossa pesquisa. Se você não quiser participar, não há problema algum. Gostaríamos muito de contar com a sua participação neste estudo para entender melhor como multilíngues, como você, reconhecem palavras em inglês. Antes de você decidir, vamos lhe dar mais informações sobre a pesquisa.

1- QUAL É O OBJETIVO DA PESQUISA?

O objetivo dessa pesquisa é investigar a influência do espanhol e do português brasileiro no reconhecimento visual de palavras em inglês.

2- QUAIS ATIVIDADES VOCÊ REALIZARÁ?

Se você aceitar participar dessa pesquisa, você realizará quatro atividades individualmente. Primeiramente, você responderá um questionário com perguntas sobre seus

idiomas, os países que morou, as culturas com que se identifica, a turma em que estuda, as dificuldades que possui, a alternância das línguas que utiliza, o fator socioeconômico da sua família. Não se preocupe, nenhuma pergunta do questionário será obrigatória e você terá o direito de não responder qualquer questão, sem necessidade de explicação ou justificativa. Esta atividade será feita no papel. O tempo estimado para a realização dessa tarefa é de 30 minutos. Em seguida, você realizará uma tarefa de proficiência em inglês. Nessa tarefa, você relacionará palavras e/ou frases em inglês com outras palavras em inglês. Esta atividade será feita no papel. O tempo estimado para a realização dessa tarefa é de 10 a 20 minutos.

Depois, você realizará uma atividade no computador. Você lerá frases em inglês silenciosamente. As palavras da frase aparecerão uma por vez na tela do computador. Ao ver uma palavra, você pressionará a barra de espaço para passar a próxima palavra, até chegar ao final da frase. Parece difícil, mas é bem fácil. Antes de começarmos, podemos fazer um treinamento para você se familiarizar com a tarefa. O tempo estimado para a realização dessa tarefa é de 20 a 30 minutos. Por fim, você realizará uma tarefa de reconhecimento de significado. Nessa tarefa, que será feita no papel, você reconhecerá palavras e/ou figuras e escreverá o significado delas. O tempo estimado para a realização dessa tarefa é de 10 minutos.

3- VOCÊ SERÁ PREJUDICADO SE ERRAR NAS RESPOSTAS DAS ATIVIDADES?

Não. Se você achar que não realizou bem alguma tarefa, você não será prejudicado e não sofrerá nenhuma punição na pesquisa e nem na escola onde você estuda.

4- COMO A COLETA DE DADOS SERÁ REALIZADA?

A coleta de dados será realizada em uma sala disponibilizada pela sua escola. As atividades terão duração de aproximadamente 1h 30min. Faremos as atividades em um único dia no turno da sua aula. O horário específico para a realização das tarefas dependerá da organização da sua escola e do que for melhor para você. Por isso, as atividades podem ser realizadas em dois dias e/ou no contraturno escolar. Você tem direito ao ressarcimento no caso de despesa decorrente da participação nesta pesquisa. Além disso, se ocorrer alguma intercorrência ou dano, você receberá todo o atendimento necessário. Seus pais e/ou responsáveis têm direito a solicitar indenização, se tiverem prejuízos por causa da sua participação nesta pesquisa.

5- HÁ RISCOS EM PARTICIPAR NESSA PESQUISA?

Por causa da realização das atividades, você pode se sentir cansado, desconfortável, constrangido, chateado, entediado ou nervoso. Se isso ocorrer, nos avise imediatamente. Para evitar e minimizar o cansaço, será programado um intervalo de cinco a dez minutos após a tarefa de proficiência, antes da realização da atividade no computador. Além disso, você pode parar para descanso e hidratação durante as atividades. Você também pode desistir a qualquer momento, sem nenhum prejuízo a você.

6- HÁ BENEFÍCIOS EM PARTICIPAR NESSA PESQUISA?

Participar da pesquisa não oferece benefícios diretos a você, mas a sua participação contribui para a ciência brasileira, pois a presente pesquisa pode ajudar a entender como as línguas que sabemos interagem na mente quando lemos uma palavra.

7- SUA IDENTIDADE SERÁ DIVULGADA?

É importante você saber que a sua identidade nunca será divulgada. Você receberá um código de identificação (exemplo P2025703) para preservar a sua identidade e garantir a sua participação anônima na pesquisa. Seu nome será registrado apenas no Termo de Consentimento que seu responsável assinou e neste Termo de Assentimento. Para evitar que outras pessoas acessem os seus dados durante as atividades, elas serão realizadas individualmente. Suas respostas nas tarefas ficarão armazenadas anonimamente em um dispositivo acessível somente por senha pessoal das pesquisadoras.

Seguiremos rigorosamente a Lei Geral de Proteção de Dados (Lei nº 13.709, de 14 de agosto de 2018) quanto ao tratamento de dados pessoais. Por isso, os seus dados não serão armazenados em plataformas virtuais, ambientes compartilhados ou “nuvens”, evitando que pessoas indesejadas tenham acesso a eles. Para publicação em repositório *online* vamos utilizar códigos em vez do seu nome (por exemplo, P2025703) para identificar os dados numéricos. Os resultados desta pesquisa serão divulgados em eventos ou publicações científicas sem qualquer identificação sua. Os seus dados serão codificados e analisados em conjunto com os dados de outros participantes, sem qualquer identificação pessoal. Você pode ter acesso aos resultados da pesquisa a qualquer momento entrando em contato com as pesquisadoras.

8- VOCÊ É OBRIGADO A PARTICIPAR?

Não. Você não é obrigado a participar desta pesquisa e não será prejudicado de forma alguma, se não quiser participar.

9- O QUE ACONTECE SE VOCÊ DECIDIR PARTICIPAR E DEPOIS MUDAR DE IDEIA?

Se você decidir participar e depois quiser sair da pesquisa, não há problema, porque você não será prejudicado. Você pode retirar o seu assentimento a qualquer momento e você pode deixar de participar do estudo, sem qualquer prejuízo ou punição. Você não precisa justificar a desistência.

10- O QUE É PRECISO FAZER EM CASO DE DESISTÊNCIA?

Você não precisa fazer nada. Não precisa justificar sua saída na pesquisa. Caso você queira informar sua saída, entre em contato com as pesquisadoras por telefone ou e-mail. Você também pode falar com a gente pessoalmente na sua escola. Mas isso é apenas se você quiser!

11- COMO VOCÊ PODE ENTRAR EM CONTATO COM AS PESQUISADORAS?

Tendo qualquer dúvida sobre a pesquisa, você pode entrar em contato com a mestranda Kamila Heusi Fourteau, pelo e-mail kamilaheusi@gmail.com ou pelo telefone (47) 999073127. Você também pode entrar em contato com a pesquisadora responsável Prof.ª Dr.ª Mailce Borges Mota através do e-mail mailce.mota@ufsc.br, telefone (48) 3721-3792, ou no prédio do Centro de Comunicação e Expressão – CCE, bloco B, sala 513, Universidade Federal de Santa Catarina, UFSC.

12- O QUE É O COMITÊ DE ÉTICA EM PESQUISA COM SERES HUMANOS (CEPSH)?

O CEPSH é um órgão colegiado interdisciplinar, deliberativo, consultivo e educativo, vinculado à Universidade Federal de Santa Catarina, mas independente na tomada de decisões, criado para defender os interesses dos participantes da pesquisa em sua integridade e dignidade e para contribuir no desenvolvimento da pesquisa dentro de padrões éticos. Caso você tenha alguma dúvida ou reclamação quanto à condução ética dessa pesquisa, você pode entrar em contato com o CEPSH – UFSC. Endereço: Prédio da Reitoria II, 7º andar, sala 701, Rua Desembargador Vitor Lima, nº 222, Trindade, CEP 88040-400, Florianópolis-SC. Telefone: (48) 3721-6094. E-mail: cep.propesq@contato.ufsc.br.

Você tem alguma pergunta? Você pode tirar qualquer dúvida com a gente!
Ficaremos muito feliz com a sua participação nessa pesquisa!

Este documento será assinado em duas vias. Após você escolher uma opção abaixo e assinalar a sua escolha, entregue uma via para as pesquisadoras, independentemente da sua escolha. A outra via você deve guardar com você.

Por favor, faça uma escolha:

( ) Eu aceito participar desta pesquisa.

( ) Eu não aceito participar desta pesquisa.

_____	_____
Nome do participante	Assinatura do participante
_____	_____
Nome da mestranda	Assinatura da mestranda
_____	_____
Nome da pesquisadora responsável	Assinatura da pesquisadora responsável

Local: Florianópolis (SC)
Data: _____/_____/_____

APPENDIX T – TALE IN SPANISH





UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TÉRMINO DE CONSENTIMIENTO INFORMADO – TCI

Basado en la Resolución 510/16 del CNS (Consejo Nacional de Salud)

PROYECTO DE INVESTIGACIÓN: INVESTIGANDO LA INFLUENCIA TRANSLINGÜÍSTICA EN INGLÉS

Hola,

Mi nombre es Kamila Heusi Fourteau y soy estudiante de maestría en el Programa de Posgrado en Inglés: Estudios Lingüísticos y Literarios (PPGI) de la Universidad Federal de Santa Catarina (UFSC), bajo la supervisión de la Prof.ª Dr.ª Mailce Borges Mota. Nos gustaría invitarte a participar en nuestra investigación sobre la influencia del español y el portugués brasileño en el inglés. Tus padres y/o tutores han permitido que participes en nuestra investigación. Si no deseas participar, no hay problema. Nos gustaría mucho contar con tu participación en este estudio para comprender mejor cómo los multilingües, como tú, reconocen palabras en inglés. Antes de que tomes tu decisión, te proporcionaremos más información sobre la investigación.

1- ¿CUÁL ES EL OBJETIVO DE LA INVESTIGACIÓN?

El objetivo de esta investigación es investigar la influencia del español y del portugués brasileño en el reconocimiento visual de palabras en inglés.

2- ¿QUÉ ACTIVIDADES REALIZARÁS?

Si aceptas participar en esta investigación, realizarás cuatro actividades de forma individual. Primero, responderás un cuestionario con preguntas sobre tus idiomas, los países en

los que has vivido, las culturas con las que te identificas, el grupo en el que estudias, las dificultades que tienes, la alternancia de idiomas que utilizas, el factor socioeconómico de tu familia. No te preocupes, ninguna pregunta será obligatoria y tendrás derecho a no responder cualquier cuestión, sin necesidad de explicación o justificación. Esta actividad se realizará en papel. El tiempo estimado para la realización de esta tarea es de 30 minutos. Luego, realizarás una prueba de competencia en inglés. En esta tarea, asociarás palabras y/o frases en inglés con otras palabras en inglés. Esta actividad se realizará en papel. El tiempo estimado para la realización de esta tarea es de 10 a 20 minutos.

Después, realizarás una actividad en la computadora. Leerás frases en inglés en silencio. Las palabras de la frase aparecerán una por una en la pantalla del computador. Al ver una palabra, presionarás la barra espaciadora para pasar a la siguiente palabra, hasta llegar al final de la frase. Parece difícil, pero es muy fácil. Antes de comenzar, podemos hacer una prueba para que te familiarices con la tarea. El tiempo estimado para la realización de esta actividad es de 20 a 30 minutos. Finalmente, realizarás una tarea de reconocimiento de significado. En esta tarea, que se hará en papel, reconocerás palabras y/o imágenes y escribirás su significado. El tiempo estimado para la realización de esta tarea es de 10 minutos.

3- ¿SERÁS PERJUDICADO SI TE EQUIVOCAS EN LAS RESPUESTAS DE LAS ACTIVIDADES?

No. Si consideras que no realizaste bien alguna tarea, no serás perjudicado y no sufrirás ninguna penalización en la investigación ni en la escuela donde estudias.

4- ¿CÓMO SE REALIZARÁ LA RECOLECCIÓN DE DATOS?

La recolección de datos se realizará en una sala proporcionada por tu escuela. Las actividades tendrán una duración aproximada de 1h 30min. Realizaremos las actividades en un solo día en el turno de tu clase. El horario específico para realizar las tareas dependerá de la organización de tu escuela y de lo que sea mejor para ti. Por eso, las actividades podrían realizarse en dos días y/o en el turno contrario al escolar. Tienes derecho a un reembolso en caso de gastos derivados de tu participación en esta investigación. Además, si ocurre algún imprevisto o daño, recibirás toda la atención necesaria. Tus padres y/o tutores tienen derecho a solicitar una indemnización si sufren perjuicios debido a tu participación en esta investigación.

5- ¿HAY RIESGOS EN PARTICIPAR EN ESTA INVESTIGACIÓN?

Debido a la realización de las actividades, podrías sentirte cansado, incómodo, avergonzado, molesto, aburrido o nervioso. Si esto sucede, avísanos de inmediato. Para evitar y minimizar el cansancio, se programará un descanso de cinco a diez minutos después de la prueba de competencia, antes de la actividad en la computadora. Además, podrás descansar e hidratarte durante las actividades. También puedes retirarte en cualquier momento sin ningún perjuicio para ti.

6- ¿HAY BENEFICIOS EN PARTICIPAR EN ESTA INVESTIGACIÓN?

Participar en la investigación no ofrece beneficios directos para ti, pero tu participación contribuye a la ciencia brasileña, ya que esta investigación puede ayudar a comprender cómo interactúan los idiomas que sabemos en la mente cuando leemos una palabra.

7- ¿SE DIVULGARÁ TU IDENTIDAD?

Es importante que sepas que tu identidad nunca será divulgada. Recibirás un código de identificación (por ejemplo, P2025703) para preservar tu identidad y garantizar tu participación anónima en la investigación. Tu nombre solo será registrado en el Término de Consentimiento que tu tutor firmó y en este Término de Consentimiento Informado. Para evitar que otras personas accedan a tus datos durante las actividades, estas se realizarán de forma individual. Tus respuestas en las tareas se almacenarán de forma anónima en un dispositivo accesible solo por la contraseña personal de las investigadoras.

Seguiremos estrictamente la Ley General de Protección de Datos (Ley n.º 13.709, de 14 de agosto de 2018) en cuanto al tratamiento de datos personales. Por ello, tus datos no serán almacenados en plataformas virtuales, entornos compartidos o “nubes”, evitando que personas no autorizadas accedan a ellos. Para la publicación en repositorios en línea, utilizaremos códigos en lugar de tu nombre (por ejemplo, P2025703) para identificar los datos numéricos. Los resultados de esta investigación serán divulgados en eventos o publicaciones científicas sin ninguna identificación tuya. Tus datos serán codificados y analizados junto con los datos de otros participantes sin ninguna identificación personal. Puedes acceder a los resultados de la investigación en cualquier momento contactando a las investigadoras.

8- ¿ESTÁS OBLIGADO A PARTICIPAR?

No. No estás obligado a participar en esta investigación y no serás perjudicado de ninguna manera si decides no participar.

9- ¿QUÉ SUCEDE SI DECIDES PARTICIPAR Y LUEGO CAMBIAS DE OPINIÓN?

Si decides participar y luego deseas salir de la investigación, no habrá problema, ya que no serás perjudicado. Puedes retirar tu consentimiento en cualquier momento y dejar de participar en el estudio sin ninguna penalización o castigo. No es necesario justificar tu retiro.

10- ¿QUÉ ES NECESARIO HACER EN CASO DE DESISTENCIA?

No es necesario hacer nada. No es necesario justificar tu salida de la investigación. Si deseas informar tu salida, puedes ponerte en contacto con las investigadoras por teléfono o correo electrónico. También puedes hablar con nosotros personalmente en tu escuela. ¡Pero esto solo si lo deseas!

11- ¿CÓMO PUEDES CONTACTAR A LAS INVESTIGADORAS?

Si tienes alguna duda sobre la investigación, puedes ponerte en contacto con la estudiante de maestría Kamila Heusi Fourteau por correo electrónico a kamilaheusi@gmail.com o por teléfono al (47) 999073127. También puedes contactar a la investigadora responsable, la Prof.ª Dr.ª Mailce Borges Mota, a través del correo electrónico mailce.mota@ufsc.br, teléfono (48) 3721-3792, o en el edificio del Centro de Comunicación y Expresión – CCE, bloque B, sala 513, Universidad Federal de Santa Catarina, UFSC.

12- ¿QUÉ ES EL COMITÉ DE ÉTICA EN LA INVESTIGACIÓN CON SERES HUMANOS (CEPSH)?

El CEPSH es un órgano colegiado interdisciplinario, deliberativo, consultivo y educativo, vinculado a la Universidad Federal de Santa Catarina, pero independiente en la toma de decisiones, creado para defender los intereses de los participantes de la investigación en su integridad y dignidad, y para contribuir al desarrollo de la investigación dentro de los estándares éticos. Si tienes alguna duda o queja sobre la conducción ética de esta investigación, puedes ponerte en contacto con el CEPSH – UFSC. Dirección: Edificio de la Rectoría II, 7.º piso, sala 701, Rua Desembargador Vitor Lima, n.º 222, Trindade, CEP 88040-400, Florianópolis-SC. Teléfono: (48) 3721-6094. Correo electrónico: cep.propesq@contato.ufsc.br.

¿Tienes alguna pregunta? ¡Puedes resolver cualquier duda con nosotros!
¡Estaremos muy felices con tu participación en esta investigación!

Después de elegir una opción abajo y marcar tu elección, trae el documento original firmado a las investigadoras. Puedes quedarte el duplicado.

Por favor, elige una opción:

( ) Acepto participar en esta investigación.

( ) No acepto participar en esta investigación.

_____	_____
Nombre del participante	Firma del participante
_____	_____
Nombre de la estudiante de maestría	Firma de la estudiante de maestría
_____	_____
Nombre de la investigadora responsable	Firma de la investigadora responsable

Lugar: Florianópolis (SC)
Fecha: _____/_____/_____

APPENDIX U – TCLE FOR PARTICIPANTS IN BRAZILIAN PORTUGUESE







UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO – TCLE

Baseado na Resolução 510/16 do CNS (Conselho Nacional de Saúde)

PROJETO DE PESQUISA: INVESTIGANDO A INFLUÊNCIA TRANSLINGUÍSTICA NO INGLÊS

Olá,

Meu nome é Kamila Heusi Fourteau e sou mestranda no Programa de Pós-Graduação em Inglês: Estudos Linguísticos e Literários (PPGI) da Universidade Federal de Santa Catarina (UFSC), sob orientação da Prof.ª Dr.ª Mailce Borges Mota. Gostaríamos de convidar você para participar da nossa pesquisa sobre a influência do espanhol e do português brasileiro no inglês. A participação na pesquisa é voluntária e não remunerada. Nenhum valor será cobrado para você participar nesta pesquisa. Gostaríamos muito de contar com a sua participação neste estudo para entender melhor como multilíngues, como você, reconhecem palavras em inglês. Se você não quiser participar, não há problema algum. Antes de você decidir, vamos lhe dar mais informações sobre a pesquisa.

1- OBJETIVO DA PESQUISA:

O objetivo dessa pesquisa é investigar a influência do espanhol e do português brasileiro no reconhecimento visual de palavras em inglês.

2- ATIVIDADES:

Se você aceitar participar dessa pesquisa, você realizará quatro atividades individualmente. Primeiramente, você responderá um questionário com perguntas sobre seus idiomas, os países que morou, as culturas com que se identifica, a turma em que estuda, as

dificuldades que possui, a alternância das línguas que utiliza, o fator socioeconômico da sua família. Não se preocupe, nenhuma pergunta do questionário será obrigatória e você tem o direito de não responder qualquer questão, sem necessidade de explicação ou justificativa. Esta atividade será feita no papel. O tempo estimado para a realização dessa tarefa é de 30 minutos. Em seguida, você realizará uma tarefa de proficiência em inglês. Nessa tarefa, você relacionará palavras e/ou frases em inglês com outras palavras em inglês. Esta atividade será feita no papel. O tempo estimado para a realização dessa tarefa é de 10 a 20 minutos.

Depois, você realizará uma atividade no computador. Você lerá frases em inglês silenciosamente. As palavras da frase aparecerão uma por vez na tela do computador. Ao ver uma palavra, você pressionará a barra de espaço para passar à próxima palavra, até chegar ao final da frase. Parece difícil, mas é bem fácil. Antes de começarmos, podemos fazer um treinamento para você se familiarizar com a tarefa. O tempo estimado para a realização dessa tarefa é de 20 a 30 minutos. Por fim, você realizará uma tarefa de reconhecimento de significado. Nessa tarefa, que será feita no papel, você reconhecerá palavras e/ou figuras e escreverá o significado delas. O tempo estimado para a realização dessa tarefa é de 10 minutos.

3- COLETA DE DADOS:

A coleta de dados será realizada em uma sala disponibilizada pela sua escola. As atividades terão duração de aproximadamente 1h 30min. Se você achar que não realizou bem alguma tarefa, você não será prejudicado e não sofrerá nenhuma punição na pesquisa e nem na escola onde você estuda. Faremos as atividades em um único dia no turno da sua aula. O horário específico para a realização das tarefas dependerá da organização da sua escola e do que for melhor para você. Por isso, as atividades podem ser realizadas em dois dias e/ou no contraturno escolar. Você tem direito ao ressarcimento no caso de despesa decorrente da sua participação nesta pesquisa.

4- RISCOS:

Por causa da realização das atividades, você pode se sentir cansado, desconfortável, constrangido, chateado, entediado ou nervoso. Se isso ocorrer, nos avise imediatamente. Para evitar e minimizar o cansaço, será programado um intervalo de cinco a dez minutos após a tarefa de proficiência, antes da realização da atividade no computador. Além disso, você pode parar para descanso e hidratação durante as atividades. Você também pode desistir a qualquer momento, sem nenhum prejuízo a você. Ainda, se ocorrer alguma intercorrência ou dano, você

receberá todo o atendimento necessário. Você tem direito a solicitar indenização, se tiver prejuízo por causa da sua participação nesta pesquisa.

5- BENEFÍCIOS:

Participar da pesquisa não oferece benefícios direto a você, mas a sua participação contribui para a ciência brasileira, pois a presente pesquisa pode ajudar a entender como as línguas que sabemos interagem na mente quando lemos uma palavra.

6- PRIVACIDADE DO PARTICIPANTE E SIGILO DOS DADOS:

A sua identidade nunca será divulgada. Você receberá um código de identificação (exemplo P2025703) para preservar a sua identidade e garantir a sua participação anônima na pesquisa. Seu nome será registrado apenas neste Termo de Consentimento. Entretanto, a quebra de sigilo dos dados e de sua privacidade deve ser considerada, ainda que involuntária e não intencional. Isto pode trazer alguma consequência para você, mas nossos procedimentos metodológicos estão organizados ao máximo para evitar que isso ocorra. Como medida de precaução, por exemplo, os dados serão acessados somente pelas pesquisadoras, todo material em papel será guardado em armários com chave no LabLing/UFSC e os dados ficarão armazenados anonimamente em um dispositivo acessível apenas pelas pesquisadoras mediante senha pessoal. Além disso, para evitar que outras pessoas acessem os dados durante as atividades, elas serão realizadas individualmente com você.

Seguiremos rigorosamente a Lei Geral de Proteção de Dados (Lei nº 13.709, de 14 de agosto de 2018) quanto ao tratamento de dados pessoais. Por isso, os seus dados não serão armazenados em plataformas virtuais, ambientes compartilhados ou “nuvens”, evitando que pessoas indesejadas tenham acesso a eles. Para publicação em repositório *online* vamos utilizar códigos em vez do seu nome (por exemplo, P2025703) para identificar os dados numéricos. Os resultados desta pesquisa serão divulgados em eventos ou publicações científicas sem qualquer identificação sua. Os seus dados serão codificados e analisados em conjunto com os dados de outros participantes, sem qualquer identificação pessoal. Você pode ter acesso aos resultados da pesquisa a qualquer momento entrando em contato com as pesquisadoras.

7- PRÉ-REGISTRO DO ESTUDO

Este estudo está pré-registrado na plataforma *Open Science Framework* (OSF), com o objetivo de assegurar o rigor metodológico e aumentar a confiabilidade e transparência da pesquisa. Isso significa que algumas informações, como o seu objetivo, as perguntas de

pesquisa, a natureza e o desenho do estudo, os procedimentos de coleta de dados, as variáveis a serem medidas e analisadas e o plano de análise qualitativa estarão disponíveis de maneira pública na internet. Nenhum dado pessoal seu será publicado. Como explicado anteriormente, a anonimização é garantida pelo código de identificação (exemplo P2025703) também nesta plataforma.

Nós, pesquisadoras, vamos obedecer a todos os preceitos éticos implicados em pesquisas envolvendo seres humanos em todas as fases da pesquisa, conforme normatizado pela Resolução do Conselho Nacional de Saúde nº 510 de 07 de abril de 2016, que dispõe sobre as normas aplicáveis a pesquisas em Ciências Humanas e Sociais. Nós, pesquisadoras, também aderimos a esse documento e nos comprometemos a conduzir a pesquisa de acordo com o que preconiza a referida Resolução.

8- CONTATOS:

Tendo qualquer dúvida sobre a pesquisa, você pode entrar em contato com a mestranda Kamila Heusi Fourteau, pelo e-mail kamilaheusi@gmail.com ou pelo telefone (47) 999073127, ou com a Prof.ª Dr.ª Mailce Borges Mota através do e-mail mailce.mota@ufsc.br, telefone (48) 3721-3792, ou no prédio do Centro de Comunicação e Expressão – CCE, bloco B, sala 513, Universidade Federal de Santa Catarina, UFSC.

9- COMITÊ DE ÉTICA EM PESQUISA COM SERES HUMANOS (CEPSH):

Esta pesquisa foi avaliada e aprovada pelo Comitê de Ética em Pesquisa com Seres Humanos (CEPSH) da UFSC. O CEPSH é um órgão colegiado interdisciplinar, deliberativo, consultivo e educativo, vinculado à Universidade Federal de Santa Catarina, mas independente na tomada de decisões, criado para defender os interesses dos participantes da pesquisa em sua integridade e dignidade e para contribuir no desenvolvimento da pesquisa dentro de padrões éticos. Caso você tenha alguma dúvida ou reclamação quanto à condução ética dessa pesquisa, você pode entrar em contato com o CEPSH – UFSC. Endereço: Prédio da Reitoria II, 7º andar, sala 701, Rua Desembargador Vitor Lima, nº 222, Trindade, CEP 88040-400, Florianópolis - SC. Telefone: (48) 3721-6094. E-mail: cep.propesq@contato.ufsc.br.

Como informado acima, a liberdade da retirada de consentimento da sua participação é garantida a qualquer momento, sem qualquer prejuízo ou punição. Se você decidir participar e depois quiser sair da pesquisa, não há problema, porque você não será prejudicado. Você não precisa justificar sua saída na pesquisa. Caso você queira informar sua saída, entre em contato

com as pesquisadoras por telefone ou e-mail. Você também pode falar com a gente pessoalmente na sua escola. Mas isso é apenas se você quiser!

Este documento será assinado em duas vias. Após escolher uma opção abaixo e assinalar a sua escolha, entregue uma via para as pesquisadoras, independentemente da sua escolha. A outra via você deve guardar com você.

Você concorda em participar voluntariamente da pesquisa "Investigando a influência translinguística no inglês"?

( ) Concordo em participar da pesquisa.

( ) Não concordo em participar da pesquisa.

_____	_____
Nome do participante	Assinatura do participante
_____	_____
Nome da mestranda	Assinatura da mestranda
_____	_____
Nome da pesquisadora responsável	Assinatura da pesquisadora responsável

Local: Florianópolis (SC)

Data: _____/_____/_____

APPENDIX V – TCLE FOR PARTICIPANTS IN SPANISH





UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE COMUNICAÇÃO E EXPRESSÃO
DEPARTAMENTO DE LÍNGUA E LITERATURA ESTRANGEIRAS
PROGRAMA DE PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS
LABLING – LABORATÓRIO DA LINGUAGEM E PROCESSOS COGNITIVOS

TÉRMINO DE CONSENTIMIENTO INFORMADO (TCI)

Basado en la Resolución 510/16 del CNS (Consejo Nacional de Salud)

PROYECTO DE INVESTIGACIÓN: INVESTIGANDO LA INFLUENCIA TRANSLINGÜÍSTICA EN EL INGLÉS

Hola,

Mi nombre es Kamila Heusi Fourteau y soy estudiante de maestría en el Programa de Posgrado en Inglés: Estudios Lingüísticos y Literarios (PPGI) de la Universidad Federal de Santa Catarina (UFSC), bajo la orientación de la Prof.ª Dra. Mailce Borges Mota. Nos gustaría invitarte a participar en nuestra investigación sobre la influencia del español y del portugués brasileño en el inglés. La participación en la investigación es voluntaria y no remunerada. No se cobrará ningún valor para que participes en esta investigación. Nos gustaría mucho contar con tu participación en este estudio para entender mejor cómo los multilingües, como tú, reconocen palabras en inglés. Si no deseas participar, no hay ningún problema. Antes de que tomes una decisión, te proporcionaremos más información sobre la investigación.

1- OBJETIVO DE LA INVESTIGACIÓN:

El objetivo de esta investigación es investigar la influencia del español y del portugués brasileño en el reconocimiento visual de palabras en inglés.

2- ACTIVIDADES:

Si aceptas participar en esta investigación, realizarás cuatro actividades de manera individual. En primer lugar, responderás un cuestionario con preguntas sobre tus idiomas, los

países en los que has vivido, las culturas con las que te identificas, el grupo en el que estudias, las dificultades que enfrentas, la alternancia de idiomas que usas, el factor socioeconómico de tu familia. No te preocupes, ninguna pregunta será obligatoria y tienes derecho a no responder cualquier pregunta sin necesidad de explicación o justificación. Esta actividad será en papel. El tiempo estimado para completar esta tarea es de 30 minutos. Luego, realizarás una tarea de competencia en inglés. En esta tarea, relacionarás palabras y/o frases en inglés con otras palabras en inglés. Esta actividad será en papel. El tiempo estimado para completar esta tarea es de 10 a 20 minutos.

Después, realizarás una actividad en la computadora. Leerás frases en inglés en silencio. Las palabras de la frase aparecerán una por una en la pantalla de la computadora. Al ver una palabra, presionarás la barra espaciadora para pasar a la siguiente palabra, hasta llegar al final de la frase. Parece difícil, pero es muy fácil. Antes de comenzar, podemos hacer una práctica para que te familiarices con la tarea. El tiempo estimado para completar esta tarea es de 20 a 30 minutos. Finalmente, realizarás una tarea de reconocimiento de significado. En esta tarea, que será en papel, reconocerás palabras y/o imágenes y escribirás su significado. El tiempo estimado para completar esta tarea es de 10 minutos.

3- COLECCIÓN DE DATOS:

La colección de datos se realizará en una sala proporcionada por tu escuela. Las actividades durarán aproximadamente 1h 30min. Si sientes que no realizaste bien alguna tarea, no serás penalizado ni en la investigación ni en la escuela donde estudias. Realizaremos las actividades en un solo día durante el turno de tu clase. El horario específico para realizar las tareas dependerá de la organización de tu escuela y de lo que sea mejor para ti. Por eso, las actividades pueden realizarse en dos días y/o en el turno contrario escolar. Tienes derecho a ser reembolsado por cualquier gasto derivado de tu participación en esta investigación.

4- RIESGOS:

Debido a la realización de las actividades, puedes sentirte cansado, incómodo, avergonzado, molesto, aburrido o nervioso. Si esto ocurre, avísanos inmediatamente. Para evitar y minimizar el cansancio, se programará un descanso de cinco a diez minutos después de la tarea de competencia, antes de realizar la actividad en la computadora. Además, puedes detenerte para descansar e hidratarte durante las actividades. También puedes retirarte en cualquier momento sin ninguna consecuencia para ti. Si ocurre algún contratiempo o daño,

recibirás toda la atención necesaria. Tienes derecho a solicitar indemnización si sufres algún perjuicio debido a tu participación en esta investigación.

5- BENEFICIOS:

Participar en la investigación no te ofrece beneficios directos, pero tu participación contribuye a la ciencia brasileña, ya que esta investigación puede ayudar a entender cómo las lenguas que conocemos interactúan en la mente cuando leemos una palabra.

6- PRIVACIDAD DEL PARTICIPANTE Y CONFIDENCIALIDAD DE LOS DATOS:

Tu identidad nunca será divulgada. Recibirás un código de identificación (por ejemplo, P2025703) para preservar tu identidad y garantizar tu participación anónima en la investigación. Tu nombre solo será registrado en este Término de Consentimiento. Sin embargo, la ruptura de la confidencialidad de los datos y de tu privacidad puede ser considerada, aunque involuntaria y no intencional. Esto podría tener alguna consecuencia para ti, pero nuestros procedimientos metodológicos están organizados al máximo para evitar que esto ocurra. Como medida de precaución, por ejemplo, los datos solo serán accesibles para las investigadoras, todo el material en papel será guardado en armarios con llave en el LabLing/UFSC y los datos serán almacenados de manera anónima en un dispositivo accesible solo para las investigadoras mediante una contraseña personal. Además, para evitar que otras personas accedan a los datos durante las actividades, se realizarán de manera individual contigo.

Cumpliremos estrictamente con la Ley General de Protección de Datos (Ley nº 13.709, de 14 de agosto de 2018) en el tratamiento de datos personales. Por ello, tus datos no serán almacenados en plataformas virtuales, entornos compartidos o "nubes", evitando que personas no deseadas accedan a ellos. Para la publicación en repositorios en línea, utilizaremos códigos en lugar de tu nombre (por ejemplo, P2025703) para identificar los datos numéricos. Los resultados de esta investigación serán divulgados en eventos o publicaciones científicas sin ninguna identificación tuya. Tus datos serán codificados y analizados junto con los datos de otros participantes, sin ninguna identificación personal. Puedes acceder a los resultados de la investigación en cualquier momento contactando a las investigadoras.

7- PRE-REGISTRO DEL ESTUDIO

Este estudio está preregistrado en la plataforma Open Science Framework (OSF), con el objetivo de asegurar el rigor metodológico y aumentar la confiabilidad y transparencia de la investigación. Esto significa que algunas informaciones, como el objetivo, las preguntas de

investigación, la naturaleza y el diseño del estudio, los procedimientos de recolección de datos, las variables a medir y analizar, y el plan de análisis cualitativo estarán disponibles de manera pública en internet. Ningún dato personal tuyo será publicado. Como se explicó anteriormente, la anonimización está garantizada por el código de identificación (por ejemplo, P2025703) también en esta plataforma.

Nosotras, las investigadoras, cumpliremos con todos los principios éticos implicados en investigaciones con seres humanos en todas las fases del estudio, conforme a lo normado por la Resolución del Consejo Nacional de Salud nº 510 de 07 de abril de 2016, que establece las normas aplicables a las investigaciones en Ciencias Humanas y Sociales. Nosotras, las investigadoras, también adherimos a este documento y nos comprometemos a conducir la investigación de acuerdo con lo que establece dicha Resolución.

8- CONTACTOS:

Si tienes alguna duda sobre la investigación, puedes ponerte en contacto con la maestranda Kamila Heusi Fourteau, al correo electrónico kamilaheusi@gmail.com o al teléfono (47) 999073127, o con la Prof.ª Dra. Mailce Borges Mota a través del correo electrónico mailce.mota@ufsc.br, teléfono (48) 3721-3792, o en el edificio del Centro de Comunicación y Expresión – CCE, bloque B, sala 513, Universidad Federal de Santa Catarina, UFSC.

9- COMITÉ DE ÉTICA EN INVESTIGACIÓN CON SERES HUMANOS (CEPSH):

Esta investigación fue evaluada y aprobada por el Comité de Ética en Investigación con Seres Humanos (CEPSH) de la UFSC. El CEPSH es un órgano colegiado interdisciplinario, deliberativo, consultivo y educativo, vinculado a la Universidad Federal de Santa Catarina, pero independiente en la toma de decisiones, creado para defender los intereses de los participantes de la investigación en su integridad y dignidad y para contribuir al desarrollo de la investigación dentro de estándares éticos. Si tienes alguna duda o queja sobre la conducción ética de esta investigación, puedes ponerte en contacto con el CEPSH – UFSC. Dirección: Edificio de la Rectoría II, 7º piso, sala 701, Rua Desembargador Vitor Lima, nº222, Trindade, CEP 88040-400, Florianópolis-SC. Teléfono: (48) 3721-6094. Correo electrónico: cep.propesq@contato.ufsc.br.

Como se indicó anteriormente, tu libertad para retirar tu consentimiento en cualquier momento está garantizada sin ningún perjuicio o sanción. Si decides participar y luego deseas retirarte de la investigación, no hay problema, porque no serás perjudicado. No es necesario justificar tu salida de la investigación. Si deseas informar tu salida, comunícalo a las

investigadoras por teléfono o correo electrónico. También puedes hablar con nosotras personalmente en tu escuela. ¡Pero esto solo si lo deseas!

Después de elegir una opción abajo y marcar tu elección, trae el documento original firmado a las investigadoras. Puedes quedarte el duplicado.

¿Estás de acuerdo en participar voluntariamente en la investigación "Investigando la influencia translingüística en el inglés"?

( ) Estoy de acuerdo en participar en la investigación.

( ) No estoy de acuerdo en participar en la investigación.

_____	_____
Nombre del participante	Firma del participante
_____	_____
Nombre de la estudiante de maestría	Firma de la estudiante de maestría
_____	_____
Nombre de la investigadora responsable	Firma de la investigadora responsable

Lugar: Florianópolis (SC)
Fecha: _____/_____/_____