**UNIVERSIDADE FEDERAL DE SANTA CATARINA**

**CENTRO DE COMUNICAÇÃO E EXPRESSÃO**

**PÓS-GRADUAÇÃO EM INGLÊS: ESTUDOS LINGUÍSTICOS E LITERÁRIOS**

Jair Gonçalves Martins

# CROSS-LINGUISTIC SYNTACTIC INFLUENCE IN MULTILINGUAL CONTEXTS: THE PROCESSING AND ACQUISITION OF L3 ENGLISH DATIVES BY CAPE VERDEAN-PORTUGUESE BILINGUALS

Florianópolis, 2018

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Tese apresentada à Banca Examinadora do programa de Pós-Graduação em Inglês: Estudos Linguísticos e Literários da Universidade Federal de Santa Catarina para obtenção do grau de Doutor em Letras-Inglês.
Orientadora: Profa. Dra. Roberta Pires de Oliveira
Co-orientadora: Profa. Dra. Mailce Borges Mota

Florianópolis, 2018

# DEDICATION

*To my mother Fáty, and to my (grand)father, Nhu Xétu, with eternal love and gratitude…*

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**LIST OF ACRONYMS**

ACC **–** Anterior Cingulate Cortex

ALUPEC – Alfabeto Unificado Para a Escrita do Caboverdiano

AmE – American English

BLES – Basic Law of the Educational System

BP – Brazilian Portuguese

CEFR – Common European Framework of Reference for Languages

CEPSH/UFSC – Comitê de Ética em Pesquisa com Seres Humanos

CEM – Cumulative Enhancement Model

CLI – Cross-linguistic influence

CVC – Cape Verdean Creole

CP – Complementizer Phrase

DO – Double Object dative construction

DP – Declarative/Procedural

EFL – English as a Foreign Language

EP – European Portuguese

ERPs – Event-Related Potentials

ESL – English as a Second Language

fMRI – Functional Magnetic Resonance Imaging

HCN – Head of the Caudate Nucleus

INECV – Instituto Nacional de Estatísticas de Cabo Verde

L1 – First Language

L2 – Second Language

L3 – Third Language

*M* – Mean

MDG – Millenium Development Goals

ms –Milliseconds

NNV – Noun-Noun-Verb word order

NP – Noun Phrase

NVN – Noun-Verb-Noun word order

PDP – parallel distributed processing

PDT – Picture description task

PO – Prepositional Object dative construction

PP – Prepositional Phrase

RC – Relative Clause

ROI – Region of interest

*SD* – Standard Deviation

SDG – Sustainable Development Goals

*SE* – Standard Error

SLA – Second Language Acquisition

SPRT – Self-paced reading task

SRN - simple recurrent network

TLA – Third Language Acquisition

TPM – Typological Primacy Model

UFSC – Universidade Federal de Santa Catarina

UNESCO – United Nations Educational, Scientific, and Cultural Organization

V2 – Verb second rule

“Success is getting what you want.

Happiness is wanting what you get.”

Dale Carnegie.

## ABSTRACT

The present dissertation investigates the processing and acquisition of L3 English dative constructions by adult Cape Verdean (L1CVC) - Portuguese (L2EP) bilinguals at beginner and intermediate L3 English proficiency levels. Through the use of two syntactic priming tasks (an off-line picture description task and an online self-paced reading task), a translation task, and a questionnaire, three studies, distributed into three modalities (reading, oral production, and written production), tapped into implicit (for intermediate proficiency participants) and explicit (for beginner proficiency participants) cognitive processes mediating participants' transition from the non-alternating dative constructions in the L1CVC (only accepts double-object) and in the L2EP (only accepts prepositional object) to the alternating L3 English dative forms. The syntactic priming tasks aimed primarily at finding out whether cross-linguistic syntactic priming occurred across the two language pairings (L1CVC-L3English; L2EP-L3English) at the implicit level and, if so, investigate the possible sources of priming effects. The questionnaire inquired participants about their source language preference to support L3 English learning. This information was first analyzed qualitatively and then quantitatively against participants' answers in the translation task to verify whether their actual use of English dative constructions in writing was better informed by their expressed language preference (in the questionnaire) or by either stimulus language (L1CVC or L2EP) used in the text they were asked to translate. The results of all three studies show that the stimulus languages consistently subserve processing strategies in the target language. The two syntactic priming studies produced priming effects between L1CVC and L3 English suggesting interaction between their syntactic representations. No priming effects were found between the L2EP and the L3 English. The translation task showed that the stimulus language (either the L1CVC or the L2EP) functions as better predictor of the use of dative constructions in L3 English writing than the previosuly expressed language preference. Results are discussed in relation to the shared vs. separate syntax and residual activation vs. implicit learning accounts. Some pedagogical implications for EFL learning in the Cape Verdean educational context are raised towards the end of the dissertation.

**Keywords:** cross-linguistic influence/transfer, syntactic priming, dative constructions, processing strategies, L3 acquisition

**Number of pages:** 192 (206 with references)

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## RESUMO

A presente tese investiga o processamento e aquisição de construções dativas do inglês L3 por falantes adultos bilíngues que têm o cabo-verdiano como L1 (L1CVC) e o português europeu como L2 (L2EP). A pesquisa envolve dois grupos de participantes, sendo um grupo iniciante e o outro intermediário em termos de proficiência em inglês L3. Através do uso de duas tarefas de *priming* sintático (uma tarefa de descrição de imagem off-line e uma tarefa de leitura auto-monitorada on-line), uma tarefa de tradução e um questionário, três estudos distribuídos em três modalidades (leitura, produção oral e produção escrita), debruçam-se sobre os processos cognitivos implícitos (para participantes de proficiência intermediária) e explícitos (para iniciantes) que medeiam a transição das construções dativas não-alternadas do L1CVC (somente aceita o duplo-objeto) e do L2EP (aceita somente o objeto preposicional) para as construções dativas alternadas do inglês L3. As tarefas de *priming* sintático tiveram como objetivo principal verificar se os efeitos *priming* ocorrem nas duas combinações testadas (L1CVC-L3English; L2EP-L3English) ao nível implícito e, se sim, investigar as possíveis causas desses efeitos. O questionário inquiriu os participantes sobre em qual idioma de origem (L1CVC ou L2EP) eles se baseiam para assistir a aprendizagem de inglês L3. Essa informação foi analisada qualitativamente, e depois quantitativamente em comparação com o desempenho dos participantes na tarefa de tradução para verificar se o uso real de construções dativas do ingles L3 na escrita se explica por sua preferência de idioma (tal como expressa no questionário) ou pelo idioma usado no texto como estímulo (L1CVC ou L2EP). Os resultados dos três estudos mostram, de forma consistente, que o idioma de estímulo medeia as estratégias de processamento na língua-alvo. Os dois estudos de *priming* sintático produziram efeitos entre o L1CVC e o inglês L3, sugerindo interação entre suas representações sintáticas. Não foram encontrados efeitos de *priming* entre o L2EP e o inglês L3. A tarefa de tradução mostrou que o uso de construções dativas na escrita do inglês L3 se explica melhor pelo idioma estímulo do que pela preferência. Os resultados são discutidos à luz das dicotomias de sintaxe compartilhada versus sintaxe separada e de ativação residual versus aprendizagem implícita. A tese conclui com o levantamento de algumas implicações pedagógicas para a aprendizagem do inglês como língua estrangeira no contexto educacional cabo-verdiano.



**Palavras-chave:** influência trans-linguística/transferência, *priming* sintático, construções dativas, estratégias de processamento, aquisição de L3

**Número de páginas:** 192 (206 com referências)
**Número de palavras:** 59. 341

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# CHAPTER I

## INTRODUCTION

> "…we know that the sociology of language is a variable that interacts with mental representation. Minimally, language ideologies, sociolinguistic variation, language policies and linguistic identities affect access to and quality of language input, the external ingredients needed for grammatical growth." (Rothman & Slabakova, 2017, p. 33)

The opening quote above vividly captures the rationale that motivated the choice of the topic for the present dissertation and provides key perspectives from which to approach it. In multilingual contexts, the strength of a language is determined by its speakers' selection of it, often based on the criterion of its use being more advantageous than the use of alternative languages in the community to attain set personal and social goals (Dabène, 1994; Mufwene, 2013, as cited in Bangura, 2015). In Africa, the native languages tend to be downplayed in favor of the European colonial languages, which hold the privilege of *lingua franca* as they are regarded as "more effective instruments in the restricted domains established by the erstwhile colonial system (in education, the judiciary system, public administration, to name a few) [even if they are] seldom in the traditional part of their societies" (Mufwene, 2013, cited in Bangura, 2015, p. 25).

In Cape Verde, a former Portuguese colony, the situation of unequal coexistence between the native language and the colonial European language echoes the one described above. Social and political ideologies inherited from the sociocultural history of four centuries of colonization have imposed conventions that grant the first language (the Cape Verdean Creole), a lower status than the second language (the European Portuguese).[1] Quoting Fairclough (1992), "ideologies built into conventions may be more or less naturalized and

[1] I deal with the issue of L1 and L2 status in the Cape Verdean society in detail in Chapter II.

automatized, and people find it difficult to comprehend that their normal practices could have specific ideological investments" (p. 90).

In this sense, a speaker's conscious or unconscious attitudes and preferences in relation to his/her first and second languages might be shaped by the sense of prestige or stigma associated to them. Hence, the following question is worth being raised: "To what extent does the social status of a language determine a bilingual's preference or disregard towards it?" This is a very subjective question as it entails variables related to spontaneous language use that are difficult to control and/or quantify. Yet, it is an important question to ask if we are to minimally understand the source of language bias that, in its turn, "interacts with mental representation (…) affect[ing] access to and quality of language input", as suggested in the opening quote from Rothman and Slabakova (2017, p. 33).

Therefore, the question will be approached from a qualitative perspective in this dissertation (I will provide more details about the research design ahead). However, it will be hovering over the discussion concerning the following more quantifiable questions, which will be placed on the foreground: 'Are bilinguals' L3 processing strategies (implicit and explicit) governed by their preset (declared) language preference between the L1 and the L2?' 'Or can either source language facilitate L3 processing on the basis of cross-linguistic similarities?'; 'Is the source language selected to support L3 processing modality-oriented, i.e., is it selected on the basis of its dominant use in the modality being tested (e.g. reading, speaking, and writing)?'

By now it must be self-evident that the central topic under investigation in the present dissertation has to do with the influence of previously learned languages in the processing and acquisition/learning of an additional language. I elaborate on this phenomenon in the following section in which I establish the aim and scope of the present dissertation.

## 1.1 PURPOSE STATEMENT

Crosslinguistic influence (CLI) or transfer[2] is "the influence of a person's knowledge of one language on that person's knowledge or use of another language" (Jarvis and Pavlenko, 2008, p. 1). In agreement with Rothman and Slabakova's (2017) statement opening the present chapter, Jarvis and Pavlenko (2008) maintain that this influence can be approached at the individual level as a psycholinguistic phenomenon or at the social level as a societal phenomenon. The former refers to the *internal* mental processes (cognitive, conceptual, etc) that characterize CLI. The latter refers to the *external* factors (social, environmental, etc) that come into play when two (or more) languages are in contact. The present dissertation is chiefly concerned with CLI as a psycholinguistic phenomenon and, therefore, it is focused on the internal mental processes that underlie CLI.

Nevertheless, the societal view must not be ignored, since "the mind of a bilingual person is fundamentally interactive" (Kootstra, 2015, p. 21), owing to the fact that "language is a byproduct of human interaction" (Rothman & Slabakova, 2017, p. 33). According to Gries (2011, cited in Kootstra, 2015, p. 19), brain structures associated with bilingual language processing (e.g. executive control[3] networks) may be shaped by the context that characterizes a bilinguals' daily language use. For instance, whether a bilingual lives in a code-switching community or not makes a difference in his/her ability to engage or inhibit the languages he/she speaks in different moments to fulfill different communicative purposes

[2]Cross-linguistic influence has been used interchangeably with transfer (an analogous term to refer to the phenomenon) in the literature (e.g. Benson, 2002; García-Mayo, 2012; Jarvis & Pavlenko, 2008; Leung, 2007a; Odlin, 2012; Ringbom, 2007; Slabakova, 2016). Although there are differences between the terms, a discussion over the issue of terminology is beyond the scope of the present dissertation. According to Jarvis and Pavlenko (2008), the terms "cross-linguistic influence" and "transfer" "are at present the most conventional cover terms for referring to the phenomenon" (p. 4). For details on the distinction between the terms see Jarvis and Pavlenko (2008, p.3) or Sharwood Smith and Kellerman (1986, p.1).

[3] Executive control is defined as "the set of cognitive skills based on limited cognitive resources for such functions as inhibition, switching attention, and working memory" (Bialystok, Craik, & Luk, 2012, p. 2).

(Gries, 2011, cited in Kootstra, 2015). Through such exchange of linguistic experiences in the community "language users continuously adapt and update their language processing strategies to the ongoing linguistic environment" (Kootstra & Doedens, 2016, p. 727).

In the particular case of Cape Verde, there is the nontrivial fact that the first and second languages have sociocultural histories in common, which has led to the unequal coexistence between them in terms of social prestige, as mentioned earlier. This situation may induce preference towards the language of greater prestige which in, in its turn, may influence psycholinguistic behavior. The relationship between language preference and psycholinguistic behavior is an intimate one, as has been documented in numerous psycholinguistic studies (Jaeger & Snider, 2007; Kootstra & Doedens, 2016; Maia & Maia, 2005; Pickering & Ferreira, 2008) using both on-line tasks (e.g. syntactic priming, eye-tracking, lexical decision, etc) and off-line tasks (e.g. questionnaire, translation task, off-line grammaticality judgement task, etc). Moreover, Kootstra and Doedens (2016) provide examples of corpus studies on spontaneous language use which have "found that syntactic choices are influenced by recently encountered utterances in the previous discourse, both in monolingual and bilingual discourse" (p. 19). Therefore, it is plausible that the higher status of the L2 in the Cape Verdean sociolinguistic context directly influences the Cape Verdean-Portuguese bilinguals' source language preference (towards the L2) to support the learning of a third language. Once set, the preferred language will supply the syntactic structures that govern processing preference in the target language.

For instance, I will briefly describe two psycholinguistic works dealing with bilingual speakers whose results might have been confounded by the issue of the processing preference of the source language. In a study based on questionnaires, Maia and Maia (2005) investigated the comprehension of RC attachment ambiguity among adult native speakers of

Brazilian Portuguese (BP) and adult native speakers of American English (AmE) with BP as L2, with the aim of comparing the performance of the latter in relation to the L1BP speakers. It is important to note that in BP, high-attachment is favored among native speakers, whereas AmE native speakers prefer low-attachment. The authors found that the L1AmE speakers markedly favored the low-attachment structure in their comprehension of ambiguous L2BP RCs. According to the authors, one reason why this might have happened is the influence of the L1 AmE which might have been fossilized and guided processing preference in the L2BP. The authors suggest that inadequate processing strategies mediated by the dominant L1 led their bilingual subjects to develop sub-optimal representations of the L2 grammar.

In another study about relative clause (RC) attachment ambiguity involving adult monolingual and bilingual speakers of Spanish and English – languages with high and low attachment preference, respectively – Fernández (2003, 2005) sought to explore if the attachment preference of the stimulus language (either the dominant English or the dominant Spanish[4]) would affect processing strategies in the RC structure of the other language. Contrary to Maia and Maia (2005), Fernández found that her bilinguals processed the RC structure in essentially the same way, irrespective of the stimulus language.[5] Fernández

[4] Contrary to what is the practice in the literature which use age of acquisition to define bilinguals (L1, L2, etc), Fernández uses language dominance as the criterion to define her bilingual subjects. This factor might have been a confounding variable in the results of her study when compared to Maia and Maia's (2005) study based on age of acquisition.

[5] Importantly, it is possible that the divergent results between Fernández's (2003, 2005) study and those reported in the studies developed in present dissertation (Chapter VI through VIII) with respect to the influence of the stimulus language in the target language processing strategies are related to differences between the internal grammatical features of the RC attachment ambiguity targeted in her study and those of the dative alternation targeted in this dissertation. Ever since Cuetos and Mitchell (1988) discovered that RCs have a unique structural ambiguity which trigger varying attachment preference among speakers of different languages or even within the same language, RCs have enjoyed a long-standing reputable tradition among researchers focusing on the investigation of processing preference. Likewise, Dative verbs, may be biased towards the DO or the PO form in some languages, or fixed in one form in other languages (Bernolet & Hartsuiker, 2010; Rappaport Hovav & Levin, 2008). However, since Maia and Maia's (2005) results based on the RCs also conflict with Fernández's (2005), the question remains open.

concluded by making the generalization that the human sentence processing mechanism (the parser) follows the same operating principles, independently of any specific language.

Crucially, the authors of both studies reported above agree that further studies are necessary to help shed a light on the divergent results found. In the case of Fernández's (2003, 2005) study, and with respect to the confounding results in comparison to Maia and Maia (2005), Fernández (2003, 2005) suggests that the contrasting results should be due to deficits in syntax/prosody or syntax/pragmatics interface, and not to a failure of the parser, since it operates in the same way bidirectionally for the two languages known by a bilingual. concludes that most psycholinguistic studies have targeted the issue of language dominance and age of acquisition, but that it is necessary to reach a better understanding of how other variables related to the linguistic history of the speakers (e.g. frequency of L1/L2 use, language of instruction, etc) affect their RC attachment preferences, because it is very likely that the contrasting results of the experiments are related with such variables. On the other hand, Maia and Maia (2005) suggest that future studies adopt on-line procedures in order to track the parser at the moment when the processing occurs and not only afterwards, as was the case of their off-line study.

The present dissertation takes up the challenges from Fernández (2003, 2005) and Maia and Maia (2005) to conduct a psycholinguistic research that takes into account the issue of linguistic history of the participants (e.g. language of instruction) and makes use of on-line and off-line tasks to investigate the extent to which processing strategies in the target language are mediated (or not) by each of the source languages spoken by the participants and if such strategies lead them to develop optimal or sub-optimal representations. The research covers three different modalities of communication: reading, speaking, and writing. However, according to Fernández (2005), in order for a researcher to reach reliable evidence that

processing preference in the Lx are governed (or not) by the Ly (or vice-versa), it is necessary that the two languages being paired exhibit alternating structure preferences.

The field research studies reported in the present dissertation involve three languages. They are, the L1 Cape Verdean Creole (henceforth, L1CVC), the L2 European Portuguese (L2EP), and the L3 English. L3English is going to be treated as the target language, and L1CVC and L2EP as the source languages. This is because the L1CVC is the native language acquired from birth, and the learning of the L2EP (the official language and the language of social prestige) begins at the age of 6 through formal instruction. The L3 English is also learned at school, but starts around puberty age (12 to 13) and it is a foreign language with lower frequency of use. Hence, it is important to highlight that English is the *third language* among the participants who performed the psycholinguistic tasks in the present dissertation. By the time they were tested in the target (English) language they already had two consolidated systems that competed during the processing of the target structures. According to Slabakova (2016), "acquiring a second language changes the cumulative grammatical knowledge in the mind/brain, and so acquisition of an L3 does not proceed from a clean L1 slate" (p. 4).

Regarding preference when alternating structures are tested, after some research I identified dative constructions as being shared by all three languages mentioned above.[6] However, I found that each source language only allows for one, of two possible structures

[6] Relative clauses are also shared by the three languages, but due to the scarcity of literature on the topic regarding the L1CVC, it was unclear to my mind what is the attachment preference in this language. As a native speaker of CVC I have the intuition that it depends, to some extent, on the issue of animacy. For safety purposes, I decided to use the dative construction, which due to its unarguable non-alternating feature in L1CVC and in L2EP as opposed to the alternation in the target L3 English language, allows safer testing of the influence of the source language processing preference in the target language.

that make up the dative alternation[7], whereas English accepts the two structures, albeit with different verb biases (Malchukov Haspelmath, & Comrie, 2007; Rappaport Hovav & Levin, 2008). These structures are called the double object (DO) construction (e.g. *Paul gave John the ball*) and the prepositional object (PO) construction (*Paul gave the ball to John*). Such property is found in English[8] but neither in the L1CVC nor in the L2EP. Interestingly, the L1CVC and the L2EP have opposing preferences regarding dative constructions. In L1CVC, "double object constructions do not have a prepositional variant" (Baptista, 2002, p. 140)[9], while the L2EP only allows the PO construction. This state of affairs makes the dative alternation perfectly fitting to verify if processing strategies in the L3 English are more reliant on the L1CVC, on the L2EP, or on the language between them identified *a priori* as the language of preference (based on participants' sociolinguistic history), irrespective of the stimulus language.

Dative structures have been traditionally used by researchers interested in investigating the processing of structures that allow the same meaning to be expressed in two alternating forms (other structures include, active/passive transitives, relative clauses, spay-load constructions, etc) within and across languages, particularly through the syntactic priming paradigm (see Loebell & Bock, 2003; Branigan et al., 2006; McDonough, 2006; Shimpi et al. 2007; Schoonbaert et al. 2007; McDonough & Trofimovich; Shin & Christianson, 2009). The syntactic priming paradigm involves fine-grained implicit tasks (on-

[7] The dative alternation is a property found in some languages which consists on the possibility of the same meaning being expressed in two alternative structures (see Rappaport Hovav & Levin, 2008). More details on the dative alternation are provided in Chapter III.

[8] It is important to note that, although the two structures are allowed without major problems in English, the DO happens to be more frequent among native speakers than its PO alternative. This issue is developed in more detail in Chapter III.

[9] The only exception to this rule occurs with some verbs like *manda* 'to send' (e.g. *Pedro manda un prenda pa Maria* 'Pedro sent a gift to Maria).

line and off-line) that allow researchers to find out if previous exposure to one specific syntactic structure (the primes) influences the comprehension and production of similar structures (targets) in subsequent moments (McDonough & Trofimovich, 2009). In this process, the structures that are less preferred by the participants are the ones which generate stronger syntactic priming effects. This phenomenon is known as the inverse preference effect (Pickering & Ferreira, 2008).

The rationale behind the inverse preference effect is simple! If you already have a preference for a particular structure in the target language, the stimulus will not make you use that structure in the target language to a much greater extent than you have been using it already. On the other hand, if a structure is not frequent to you, or you don't use it at all, the difference between the use you make of it before and after the stimulus will be greater than in the first situation described above. This means that the syntactic priming paradigm has the power to switch a consolidated parsing strategy from a more preferred structure to a less preferred structure. While several factors may underlie the occurrence of syntactic priming effects within and between languages and modalities, the results of most studies so far have been "consistent with priming of representations that are specified for syntactic information but not semantic, lexical[10], or phonological information" (Branigan & Pickering, 2017). That is, syntactic priming occurs independently of thematic roles, morphological features (content and function words, number, tense, agreement, etc), and phonological similarity.

The present dissertation adopts the syntactic priming paradigm, as the primary psycholinguistic tool to investigate if, at the implicit level, syntactic processing in the L3 English is influenced by either stimulus (source) language (L1CVC or L2 EP), or appears to

[10] Importantly, though, when it comes to the modality of comprehension, syntactic priming has been more consistenly shown when prime and target sentences share the same lexical items (Arai et al., 2007; Felício, 2018; Weber & Indefrey, 2009).

follow the same path, irrespective of the stimulus language. Based on the findings of the cross-linguistic syntactic priming literature (e.g. Felício, 2018; Loebell & Bock, 2003; Weber & Indefrey, 2009), I assume the former proposition and, if confirmed I investigate the possible factors (lexical repetition, word order, verb bias, etc) motivating the occurrence of syntactic priming effects in the two modalities tested: comprehension (on-line self-paced word-by-word reading paradigm) and production (off-line picture description task) among participants at intermediate levels (B1/B2 of the Common European Framework of References for Languages - CEFR) of L3 English learning. The findings of the syntactic priming studies will be discussed in relation to existing literature on bilingual linguistic representation, bilingual language development and change. The syntactic priming experiments will be preceded by a baseline phase designed to obtain information about participants' dative structure preference in the target language prior to submitting them to the prime stimuli. The baseline phase will be vital for the interpretation of the results of the syntactic priming experiments.

In addition to the syntactic priming experimental tasks, a translation task will be applied to a lower proficiency group of participants to investigate the processing strategies of dative constructions by learners who are at initial levels of English acquisition (A1/A2 of CEFR). The task will test the modality of writing with the aim of verifying if, at initial stages of L3 acquisition in which explicit mental processes are engaged, the use of datives in L3 English written translations is better explained by the dative structure prompted by each source language or is determined by preset language preference. If the first hypothesis is true, then the use of datives in L3 English written translations will alternate between DO and PO. If the second hypothesis is true, only the structure prompted by the language of preference will be used.

However, there is robust evidence in CLI literature regarding the role that either the L1 or the L2 exerts at initial stages of L3 acquisition. For instance, the Typological Primacy Model (TPM) by Rothman, Bañon, and Alonso (2015) posits that, at initial stages of L3 acquisition either the L1 or the L2 can be a potential source of transfer, but that what ultimately determines the source language to be transferred is the perception of "underlying structural similarity between the languages at play" (Rothman, 2015, p. 4). Based on this model, I predict that the structure of the source language *does* matter and, hence, there will be alternation in the use of dative structures in written translations, in accordance with perceived structural similarities between the stimulus language and the target language. The information about prior language preference will be obtained by way of a semi-structured questionnaire about language attitudes and preference between the L1CVC and the L2EP to support L3 English learning. The answers to the open-ended questions in questionnaire will supply the qualitative data of the dissertation. More details on the design of each task used in the field research are provided in Chapter V – Method.

Despite the likelihood of the sociolinguistic history of the source languages to influence the results of the psycholinguistic studies carried out in the present dissertation, it is important to acknowledge that the characteristics of the tasks – particularly the syntactic priming experiments, which were designed as laboratory experiments – will constrain the formulation of any strong claim regarding a decisive role of the unequal social statuses of the source languages to explain the quantitative results obtained. This means that, while the tasks will allow for the identification of the source language preference between the L1CVC and L2EP and the respective dative structure attached to each of them, it will not be possible to claim that the preference for one or the other language or structure is directly linked to the social status (e.g. prestige) of that particular source language (although the social status of the

source language seems to be the most obvious explanation). Put simply, the tasks are designed to determine the preference towards one or the other language (and its repsective dative structure), but not the *reason why* one source language is favored to the detriment of the other.

Nevertheless, where such claims cannot be made based on the quantitative data obtained, the qualitative data (collected through the semi-structured biographical and language questionnaire) consisting of open-ended answers about language attitudes and preference associated to the social status of prestige or stigma ascribed to each of the source languages will provide important clues for reflection. It is my hope that the overall results of the quantitative and qualitative studies developed in the present dissertation will facilitate the opening of fresh avenues for further investigation by raising intriguing research questions and/or grounded hypotheses concerning the CLI phenomenon, towards an interface between psycholinguistics and the sociology of language.

## 1.2 SIGNIFICANCE OF THE RESEARCH

At a global level there is a dearth of studies addressing language processing and/or acquisition from a multilingual perspective. Instead, most studies have prioritized monolingual or bilingual speakers (Herdina & Jessner, 2002). Herdina and Jessner (2002) defend that "research on linguistics should be centred on the multilingual speaker as the norm, not on the monolingual individual [because] the majority of the world's population is multilingual" (p. 1). The paradigm shift into a multilingual perspective would make perfect sense today, since we live in a globalized digital world, with constant cross-linguistic interactions between speakers of different cultural and sociolinguistic backgrounds, often involving more than just two languages.

On the other hand, CLI at the level of syntax remains under investigated. By far most CLI studies have privileged the role of the lexicon over that of syntax (Włosowicz, 2012;

Berkes & Flynn, 2012). The results of the psycholinguistic studies in the present dissertation (particularly the syntactic priming tasks) are expected to illuminate the debate over the organization of L1 and L2 syntactic information in the brain (the *separate-syntax vs. shared-syntax accounts*) as well as the possible mechanisms underlying the occurrence of syntactic priming effects (*residual activation* vs *implicit learning* accounts), providing valuable inputs for the discussion on cross-linguistic syntatctic influence.

Finally, in the specific case of CVC, to my knowledge, there is presently no CLI study which has used psycholinguistic tasks to investigate syntactic processing involving Cape Verdean participants in the Cape Verdean linguistic context. Therefore, the present dissertation offers a pivotal research in the field, with possible pedagogical implications concerning the role of L1CVC and L2EP in the processing and acquisition of English as a foreign language (EFL), at least as far as the dative constructions are concerned. This in turn might motivate further psycholinguistic studies with other structures within and between the languages spoken in Cape Verde.

In summary, the present dissertation is expected to give three main contributions: 1) to enlighten the debate among existing theories on CLI and syntactic priming; 2) to promote the advancement of third language acquisition (TLA) as a field in its own right; and 3) to raise pedagogical implications for the roles of the source languages in EFL teaching in the Cape Verdean educational context and lay the groundwork for subsequent psycholinguistic studies involving the languages spoken in Cape Verde. To this end, the theoretical framework covers three fields of inquiry: 1) Sociolinguistics, concerning language attitudes and source language preference, 2) Third language acquisition, concerning the main source of transfer into L3 English at initial stages of acquisition, and 3) Psycholinguistics, concerning the organization of syntactic representation among Cape Verdean-Portuguese bilinguals learning L3 English.

## 1.3 ORGANIZATION OF THE DISSERTATION

From this point onwards, the present dissertation is organized as follows: Chapter II provides a general view of the Cape Verdean sociolinguistic and educational context with the aim of introducing the reader to the reality of the country and offer a perception of the profile of the participants who supplied the data that allowed the realization of the studies reported in the present dissertation. Chapter III focuses on the implicit cognitive mechanisms underlying cross-linguistic syntactic influence. To this end, the chapter reviews the relevant literature on bilingual processing models and on the studies developed within the syntactic priming paradigm, with a special attention to the dative constructions. Issues related to the organization of linguistic (syntactic) representation (shared-syntax account vs. separate syntax account) and the mechanisms underlying syntactic interaction in the bilingual brain (residual activation account vs. implicit learning account) will be at the center of the discussion through the review of syntactic priming studies that have been carried out in the comprehension and (oral) production modalities. In the sequence, Chapter IV focuses on the explicit processes that instantiate CLI concerning past puberty L3 acquisition. For that, the chapter will review the three most influential L3 models of morphosyntactic transfer that have been developed in the last decade. Chapter V describes and delineates the methodological procedures that guided the design and execution of the pilot study realized in 2016 and the adjustments to be made thereof aiming at the full implementation of the actual field research composed by the three studies. Chapter VI describes the methodological design of Study I (the first syntactic priming study), which used the picture description task. The design includes the adjustments reported in the pilot study. This is followed by a report of the findings of Study I. Chapter VII reports the second syntactic priming study (Study II), which was carried out through the self-paced reading task. It reports the amendments to the pilot version and discusses the findings in

relation to the relevant literature. Chapter VIII reports the results of Study III, which combines the qualitative and quantitative approaches to shed a light on the issue of L3 English acquisition by adult low proficiency learners. The research tools include a biographical and language questionnaire and a translation task. The findings are reported in relation to their impliciations for the theoretical discussion within the emerging L3 acquisition research field. Finally, chapter IX summarizes the main findings of the studies reported in the dissertation and then presents some pedagogical implications for EFL learning in the Cape Verdean educational context. The chapter concludes with the acknowledgement of the limitations inherent to the methodological designs of the studies reported in the dissertation and points to some possible directions for future research.

# CHAPTER II

## THE CAPE VERDEAN SOCIOLINGUISTIC AND EDUCATIONAL CONTEXT

This chapter provides a brief overview of the Cape Verdean sociolinguistic and educational contexts from a chronological perspective, as a means to promote the reader's understanding of the participants' backgrounds with respect to Cape Verdean and European Portuguese (the source languages involved in the present dissertation). In so doing, the chapter describes the historical and contemporary relationship that exists between the source languages, the educational system in which the learning of the target language (English) occurs, as well as the current biographical and language profiles of the participants who took part in the experiments and completed the tasks at hand. Such information may be helpful to understanding the results of the studies.

The chapter opens with a description of the geographic location of the Cape Verde Islands followed by a brief historical account of the discovery of the islands by the Portuguese colonizers and the settlement of the archipelago with West African people, a process that started in the second half of the 15th century. From the coexistence between diverse groups of people speaking various European and African languages, a link will be made to the circumstances which promoted the emergence of the *pidgin* which underwent an evolutionary process to turn into the Cape Verdean Creole that is spoken nowadays on the islands as the mother tongue along with Portuguese as the second and official language. From this, the resulting typology of bilingualism that typifies such a linguistic context will be scrutinized.

The chapter closes with a description of the Cape Verdean educational system's historical evolution from the independence of the country in 1975 to the present date. This allows the raising of pertinent questions concerning the status of the L1CVC in relation to L2EP as the language of instruction and the pedagogical implications for EFL learning.

## 2.1 CAPE VERDE: A BRIEF GEO-HISTORICAL BACKGROUND

Cape Verde (known as Cabo Verde to the Portuguese-speaking world[11]) is an insular country of volcanic origin, made up of ten islands (one of which is uninhabited) situated approximately 600 kilometers off the West Coast of Africa (cf. Map 1.) and covering an area of roughly 4000 square kilometers.

**Map 1.** ***Geographic location of Cape Verde***

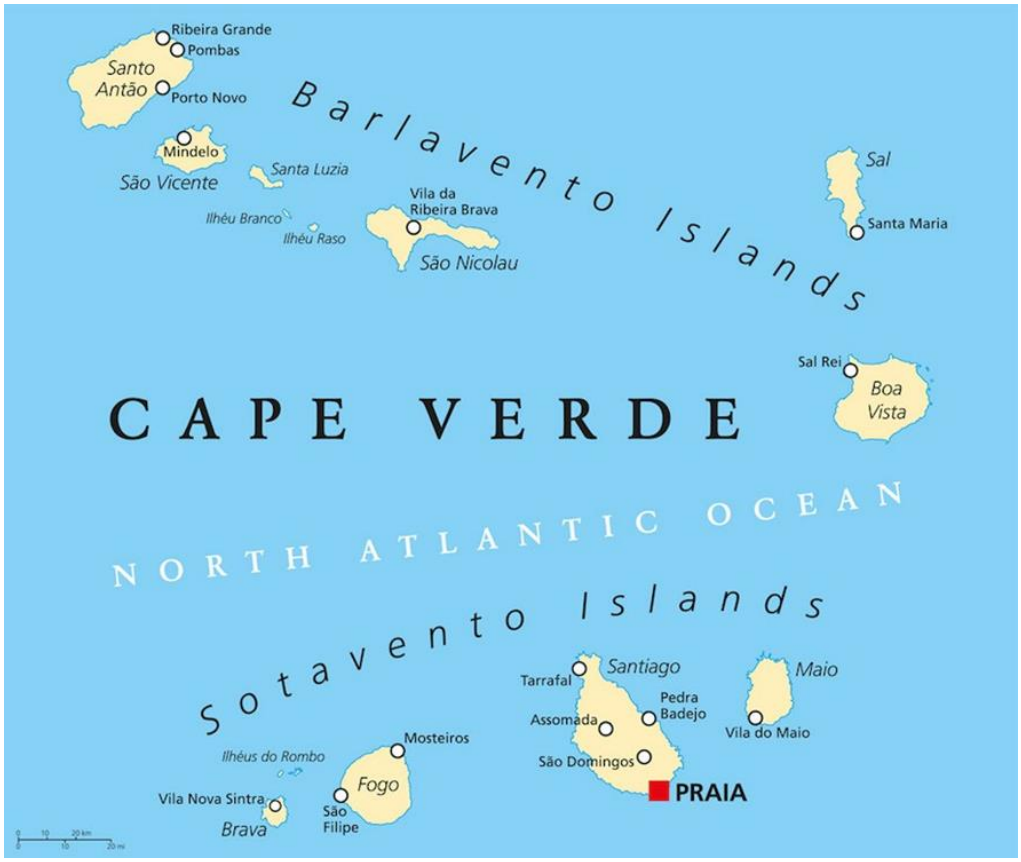

Source: (http://worldlyrise.blogspot.com/2013/04/cape-verde-land-and-people.html)

The archipelago is divided between two groups of islands (cf. Map 2.) called *Barlavento* (the Portuguese word for the windward islands located in the north) and *Sotavento* (the Portuguese word for the leeward islands located in the south). *Barlavento* is composed of

[11] The name Cape Verde is the English translation of Cabo Verde (in Portuguese). Due to the fact that each time Cabo Verde sent out a diplomatic mission the name of the country was translated into the native language of the host country, the Cape Verdean Ministry of Culture send out a missive to the United Nations in October 2013 asking that the country be addressed as Cabo Verde "in all official languages of the United Nations… and request that it should not be translated" (Johnson, 2014). The request was approved in December of the same year. However, the name change has faced with some resistance in the International Community and, even today, the name Cabo Verde has been used interchangeably with its English version Cape Verde in diplomatic missions, tourism, business encounters, scholarly papers, etc. In this dissertation, the English translation Cape Verde is used, along with its derivatives (e.g., Cape Verdean), following the practice of recently published works in the English language in different fields of scientific inquiry including sociology, formal semantics, and genetic relationship (see Pires de Oliveira & Martins, 2017; Verdu et al, 2017).

six islands, Santo Antão, São Vicente, Santa Luzia (the only uninhabited island of Cape Verde), São Nicolau, Sal, and Boavista. *Sotavento* comprises the remaining four islands, Maio, Santiago (the largest and most populated and where the capital, Praia, is located), Fogo, and Brava, the smallest among the ten islands.

**Map 2.** ***Cape Verde: the Barlavento and Sotavento Islands***




Source: (https://www.explore-cape-verde.com/binter-cv-to-add-another-island-to-their-schedules/)

The archipelago was discovered by Portuguese explorers in the 15th century and was populated by African slaves and European colonizers. The exact date of the discovery as well as the name of the discoverers remain subjects of controversy and dispute. According to Carreira (1972) there is historical cartographic evidence of an African tribe called Jalofos that might have inhabited the island of Santiago before the arrival of the Portuguese settlers.

Baptista (2002) points to "a number of references to the presence of human settlements in Cape Verde before the Portuguese arrivals [that] can be found in writings dating back to the 19th century" (p. 15).

The European settlers who arrived to the islands in the 15th century were predominantly composed of Portuguese people (from the continent and from Madeira), but there were also people from other origins such as Genoa, France, and Spanish Jewish (Carreira, 1983). The Europeans intended to populate the country exclusively with whites, in a similarl way to what happened in Madeira and Azores. However, the adverse climate made it impossible to produce cultures based on cereals, which constituted the basis of their dietary habits. This situation posed a major drawback for the white settlement in Cape Verde, and they were soon forced to find alternatives to ensure their survival on the islands. Therefore, they decided to bring slaves from the Western Africa, from Senegal, Sierra Leone, and chiefly the Guinea (current Guinea-Bissau) which lodged their most important reserve of slaves after the decline of the Portuguese colonial Empire as a result of the expansion of other European powers such as England, France, and the Netherlands (Carreira, 1972).

The settlement of the islands occurred in a phased manner, starting in the *Sotavento* region. Santiago (cf. Map 3.) received the first tranche of people in 1460. It was followed by the island of Fogo and, later, the islands of Maio and Brava. The *Barlavento* islands started to be populated in the 17th and 18th centuries. According to Brasio (1962, as cited in Baptista, 2002), an 1862 census that was carried out on the islands in the year of 1856 refers to a number of African ethnic groups which composed the African population in Cape Verde, coming mainly from the Guinean regions of Cacheu and Bissau. Among them were the

aforementioned Jalofos, but there were also the Balantas, Bijagos, Fulas, Mandingas, Manjaks, Pepels, and Wolofs, just to name a few.[12]

**Map 3.** ***The Island of Santiago***


Source: (http://www.intercidadesrentacar.cv/santiago.php)

The contact between the African ethnic groups and the European colonizers are at the basis of the formation of the Cape Verdean society and of the mother tongue, the Cape Verdean Creole (CVC). It is important to highlight that there are two major varieties of the CVC: the one spoken in São Vicente Island and the one spoken in Santiago Island. This dissertation is concerned with the variety spoken on the island of Santiago which is by far the most representative CVC variety. According to Census 2010 (the last one realized), 56% of the country's population resides on the island of Santiago (INECV, 2010 - *Portal do Instituto Nacional de Estatística*). The variety spoken on the island of Santiago is followed in

[12] For more details on the formation of the Cape Verdean society see Baptista (2002).

representativeness by the variety spoken on the island of São Vicente, whose population was calculated at 15.5% of the country's total.

The CVC is said to have evolved from a Portuguese-based *pidgin* (Carreira, 1982) which arose from the necessity of the people to communicate with one another, especially in the trips between Europe and West Africa. This pidgin would later evolve into a proto-creole that eventually developed in Senegambia and Cape Verde. The content lexicon of the CVC is almost entirely originated from the European Portuguese[13] (EP). Only a small amount comes from the various Western African languages spoken by the ethnic groups that were brought to the islands in the condition of slaves.

Although it is the mother tongue in Cape Verde, the CVC carries the historical burden of being traditionally an oral language without a systematized writing system, hence, a language of low prestige coexisting with another of greater prestige (Brito-Semedo, 2006; Furtado, 2010; Pereira, 2006; Veiga, 2015; Lopes, 2016). This unequal coexistence is reflected today, after almost forty-three years of the proclamation of the independence of the islands, in the fact that the EP remains the only official language in the country, of obligatory use in all administrative, official, and legal acts and documentation. CVC, on the other hand, is reserved to the informal situations of eveyday life. This situation has generated an asymmetric typology of bilingualism which will be discussed in the following section.

## 2.2 BILINGUALISM IN CAPE VERDE: THE STATE OF DIGLOSSIA

The European Portuguese (L2EP) is the second language in Cape Verde, yet it is the only official language, relegating CVC to spheres of informality. Hence, the two languages

[13] It is difficult to talk about exact numbers since studies are scarce. But there are some unofficial estimates that 90% of the CVC lexicon is originated from the European Portuguese.

coexist in a state of diglossia[14] (Duarte, 1998). Notwithstanding the numerous voices from the Cape Verdean social elite and from academic spheres that have demanded the officialization of the mother tongue to grant it the same status as L2EP, the L1CVC remains unofficial. This situation has prevailed since 1975 with the proclamation of the independence of the islands and the adoption by the transition government of the L2EP as the official language.

In general, the first formal contact that Cape Verdeans have with L2EP happens at school when children are around the age of six (this contact can take place earlier, at around three years of age, if children have the opportunity to attend the pre-school, which is not obligatory). Besides being the mandatory language of instruction in schools, the L2EP is present in the lives of Cape Verdeans daily through television, radio, newspapers, etc. Hence, moments of code-switching can occur with greater or lesser frequency in some formal spoken interactions, depending on the proficiency in L2EP, the subject matter, attitudes and ideologies of the interlocutors regarding the use of the L1CVC or of the L2EP.

The literature offers diverse and inconclusive definitions of bilingualism, all of which reflect the dimensions of bilingualism that are the focus of attention of the authors who propose them. A strict view proposes that bilinguals are individuals who have "native-like control of two languages" (Bloomfield, 1933, p. 56). This view is highly inflexible and, thus, has not been adopted by most researchers in the field of bilingualism (Butler & Hakuta, 2006). A broader view maintains that bilinguals are individuals who are fluent in one language but who "can produce complete meaningful utterances in the other language" (Haugen, 1953, p. 7). Under this latter view, even early-stage L2 learners can be classified as bilinguals. A more balanced view, suggests that bilinguals are individuals or groups of people

[14] In a context of diglossia two languages coexist in an unequal basis, being the context of Cape Verde a good example, since the L1CVC is only used in informal situations, whereas the Portuguese, which is regarded as a language of higher status, is used in formal situations.

with various degrees of proficiency who are able to communicate in oral or written forms in both languages in a given society (Mohanty and Perregaux, 1997). This view takes into account the psychological or social states deriving from such interactions. The present dissertation adopts this *more balanced* definition of bilingualism.

That said, Cape Verdeans can be regarded as bilinguals, attending to different typologies of bilingualism that are related to linguistic competence, and considering the history of the sociolinguistic trajectory of the Cape Verdean society that is related to language use. In terms of the typologies related to linguistic competence, these may be based on age of acquisition, proficiency, language status, functional ability, cultural identity and so forth (see Butler & Hakuta, 2006, pp. 116-117). For instance, attending to age of acquisition, Cape Verdean speakers of Portuguese would be classified as late-bilinguals (see Genesee, Hamers, Lambert, Mononen, Seitz, & Starck, 1978) since they start learning the L2EP around the age of six. On the other hand, with regard to proficiency (in oral communication), the classification of these learners would be of dominant bilinguals (see Peal & Lambert, 1962), for they are orally more proficient in L1CVC which they start learning from birth, than they are in EP (Lopes, 2016), which they start learning at school and whose use is reserved to formal settings. Nevertheless, due to the dominant use of L2EP in the educational environment, Cape Verdeans have developed their writing skills in L2EP, but not in the native language. This situation poses the intriguing question of which language will be the main source of transfer into the target language during writing. This question will be investigated through the application of the written translation task whose results will be discussed in Chapter VIII.

With respect to the history of the sociolinguistic trajectory of the two languages in use in Cape Verde, they have been in contact for the last five centuries. Despite the fact that EP

has always enjoyed a higher status than CVC and a process of decreolization has been underway for more than three decades to the point that some researchers have labeled CVC as *a decreolized, Portuguese-based creole* (Bickerton, 1981; Thomason & Kaufman, 1988, as cited in Clements, 1996), EP has not overshadowed the CVC to the point of its extinction. Rather, CVC has resisted and remains a lively and active language (Veiga, 2015). The two languages have mutually influenced one another to the extent that some linguists are now considering the existence of a Cape Verdean Portuguese (CVP) with its unique characteristics (see Lopes, 2016, p. 19). In this context, from the perspective of language use, bilingualism is understood as the ability to effectively engage in code switching, i.e., to automatically alternate between two languages in different moments in order to meet communicative needs (Oksaar, 1971, as cited in Lopes, 2016).

Lopes (2016) follows this line of thought to argue that the situation that characterizes the Cape Verdean society is one of social bilingualism (with diglossia), although it is also pertinent to consider an individual bilingualism since the individual linguistic history has clear consequences on the person's sociolinguistic profile (Lopes, 2016).[15] In this context, the phenomenon of inter-sentential code-switching (see McCLure, 1977) gains relevance when the speaker selects one language to use in a certain circumstance and the other language in a different moment (Thomason, 2001), based on socially imposed conventions that have no relationship with linguistic parameters, but rather with changes in terms of the interlocutors, of the topic of the conversation, or of the venue (Martins, 1994a, as cited in Lopes, 2016).

[15] "A história linguística individual tem consequências claras no perfil sociolinguístico de cada informante" (Lopes, 2016, p. 43).

### 2.2.1 Full-fledged or developing bilingualism?

Contrary to Lopes (2016), Veiga (2015) argues that the bilingual status in Cape Verde is not full-fedged, but rather, it is a *developing bilingualism*. In a short article published to the journal *PAPIA*, the author defends that the coexistence between the CVC and the EP in a state of diglossia does not facilitate the existence of a *real (social) bilingualism*. According to this author, a real bilingualism presupposes the use of CVC and Portuguese, on an equal status, in all formal and informal situations of communication, particularly in teaching, research, administration, media, justice, religious acts, etc. (Veiga, 2015).[16] While Portuguese satisfactorily fulfills the formal domain, it has a limited presence in the informal domain, whereas with CVC the situation is exactly the opposite. The author maintains that as long as both domains (formal and informal) remain only partially fulfilled, one cannot talk about a real, full-fledged bilingualism, but rather, a developing one. In order to overcome the situation, the author suggests that the massification of a rigorous instruction with adequate L1 teaching methodology applied to CVC and L2 applied to EP is the best way to go.[17]

Still, concerning the CVC, there is also the issue of varietial differences across the islands. However, from a social perspective, two varieties stand out as the most representative ones: the variety spoken in Santiago (in *Sotavento*) and the variety spoken in São Vicente (in Barlavento). They are the ones with the largest numbers of speakers (as mentioned elsewhere) and which tend to exert a glottophagic[18] effect upon the neighboring varieties. Based on this tendency, Veiga proposes that the teaching of CVC assumes an inter-regional perspective,

[16] "Um real bilinguismo pressupõe o uso, com estatuto equiparado, do CCV e do português em todas as situações formais e informais de comunicação, particularmente no ensino, na investigação, na administração, na comunicação social, na justiça, nos atos religiosos, etc" (Veiga, 2015, p. 184).

[17] "A massificação de um ensino rigoroso e com metodologia adequada para a L1, aplicada ao CCV, e de L2, aplicada ao português, é o caminho mais adequado" (Veiga, 2015, p. 185).

[18] Glottophagy is understood as "the absortion or replacement of minor languages by major languages" (Calvet, 1974).

gouping the islands in two axis: the Northern Axis comprising the Barlavento varieties around the variety of São Vicente, and the Southern Axis comprising the *Sotavento* varieties around the variety spoken in Santiago. In order to preserve the characteristics of the least representative varieties, the author proposes that the teaching starts locally, based on the variety spoken on each island and then bridges with that of São Vicente or Santiago.

The author recognizes that there is the danger of this methodology reinforcing the celebration of the two most representative varieties (from a social perspective) and the gradual shrinking of the others, but points to important gains in the long-term because "the language of consensus that will emerge from this inter and intradialetal process will be a rich and diversified expression because brewed and refined from a linguistically oriented diversity" (Veiga, 2015, p. 186). The author concludes that, in a context of linguistic variety, his proposal is a possible standardization strategy, and in case it is not consensual, any other strategy should have a scrupulous respect for cultural and linguistic diversity towards a real social bilingualism.

From the claims presented by Veiga (2015) in relation to the absence of a real social bilingualism in Cape Verde, it remains unclear what his theoretical bases are, i.e., the definitions or typologies of bilingualism that he uses to support his views. Hence, for the purposes of the present dissertation, the social bilingualism view proposed by Lopes (2016) will be adopted. From the political point-of-view, Veiga' (2015) proposal has not received much support among educational policymakers and an effective teaching of CVC in schools is yet to be implemented.

## 2.3 THE CAPE VERDEAN EDUCATIONAL SYSTEM: EVOLUTION AFTER THE INDEPENDENCE AND CURRENT ORGANIZATIONAL CHART

The educational system in Cape Verde has gone through profound changes starting from the colonial times until the present date. [19] This section focuses on the evolution of the educational system after the independence in 1975 until today just as a means to have a better picture of the participants who took part in the experiments conducted in the present dissertation. The first reform proposal of the educational system after the independence took place in 1977 with the National Meeting of Educational Practitioners on the Island of São Vicente. Despite the criticism against the colonial educational system which was regarded as an extension of the Portuguese system – whose ultimate end was to cultivate a culturally submissive mentality and justify the perpetuation of colonial dominance – the new proposal was a perfect reflection of its precedessor, with no relevant changes on structure (Non-mandatory Pre-School; 4 years of Basic Elemenary Instruction; 2 years of Basic Complementary Instruction; Secondary Education with two tracks: general and technical) and pedagogical practices, a fact that was later pointed out by UNESCO (Cabo Verde, 1977, as cited in Moura, 2016).

With the first Cape Verdean Constitution of 1980 founded on the premises of justice, freedom and equality for all Cape Verdeans on the islands – such premises were denied under the colonial regime – a real break up with the educational model of the colonizers was expected. The role of education in this process was fundamental, for only through education could cultural practices and political ideologies of the colonizers be extirpated and the integration of individuals in the Cape Verdean society facilitated (Cabo Verde, 1980, as cited

[19] An exhaustive descprition of the evolution of the educational system starting from the colonial era is beyond the scope of this dissertation. For more details see Moura (2016) "O sistema educativo cabo-verdiano nas suas coordenadas socio-históricas".

in Moura, 2016). In this sense, it was urgent to design an educational system that was rooted in the reality of the Cape Verdean people and their needs. Article 44 of the Constitituion stressed that education was a right and a duty of every citizen and it was up to the State to ensure freedom and equality of opportunities of access to everyone. This expectation was frustrated in practice due, on the one hand, to the socioeconomic limitations of the families and, on the other hand, to the lack of teaching facilities and trained teachers on the islands (Moura, 2016).

It was only in 1990 in the period known as Democratic Transition[20] that some real, significant changes in the Cape Verdean educational system began to take place. The political openess from a monopartidary regime to a multipartidary one facilitated the emergence of a new social atmosphere based on economic trust which imeediately started to have positive impacts at the social, cultural, and educational levels. The institution of the Basic Law of the Educational System (BLES)[21] in 1990 by the Decree-Law No. 103/III/1990 consituted the highlight of the history of Education in Cape Verde. The new system opened doors to private investment in education, facilitating the increase of access.

[20] Between 1975 and 1990 the political regime was a monopartidary one in which in all powers were concetrated in the hands of the transition government, the PAICV (Partido Africano para a Independência de Cabo Verde – "African Party for the Independence of Cape Verde"). In 1990 a political openess took place allowing new parties to run for elections to govern the country.

[21] With the BLES, the educational system became structured as follows: 1- Non-Mandatory Pre-school (under the responsibility of families and local city hall); 2- Six years of Mandatory Basic Instruction divided in three cycles of 2 years each; 3- Six years of Secondary Instruction comprising three cycles of two years each (the first cycle complements the Basic Instruction; the second cycle includes two tracks – general and technincal – that students can choose, the third cycle also divided in two tracks but offering specific fields of specialization such as humanities, economy, and science and technology, as a preparation for university-level studies); 4- Middle Instruction with the aim of offering professional training to students who completed at least the second cycle of the Secondary Instruction (the training lasted 3 years); 5- Higher Education, comprising university-level education and politechnical instruction; 6- Special Education to promote the social and educational integration of children with special needs; 7- Distance Education as an alternative or complement to formal education through technological means; 8- Extra-school education with the purpose of eliminitating illiteracy and promoting training towards the exercise of a profession.

The expansion and massification of educational access was one of the greatest gains of the BLES, reinforced by the Constitution of 1992 that is still in force today. Subsequent reforms took place in the educational system but they did not operate profound changes. Rather, they introduced amendments to respond to the new social, cultural, and economic challenges that emerged with the passing of the years and to implement new pedagogical practices oriented to overcoming the challenges imposed by the era of digital technology and globalization in the 21st century. Hence, after the mother reform introduced through the BLES of 1990, two more reforms took place. The first reform[22] was introduced in 2010 by the Decree-Law No. 2/2010 centered on the attempt to modernize the Cape Verdean educational system (Delgado & Melo, 2016).[23] The second reform[24] took place in 2017 and gave origin to the structure that is currently in force.

Despite visible gains in the Cape Verdean educational system brought by reforms spanning from the introduction of the BLES in 1990 until today, there is still a lot of work to be done in terms of pedagogical practices. The attempts to attenuate the negative marks (chiefly ideological) of the colonial regime in the Cape Verdean classrooms only through the implementation of reforms in the structure of the educational system and curricular adaptations have been frustrated by the privileged status granted to the second language

[22] With the first reform, the educational system became sructured as follows: 1- Non-mandatory Pre-school (lasting 4 to 6 six years); 2- Eight years of Mandatory Basic Instruction divided in three cycles (first cycle lasting 4 years; second and third cycles lasting 2 years each); 3- Four years of Secondary Instruction divided in two cycles of two years each (first cycle is mandatory; second cycle is not); 4- Higher Education; 5- Special Education; 6- Distance Education; 7- Extra-school education.

[23] "O decreto-legislativo de 2010 está pautado na tentativa de modernização do sistema educativo cabo-verdiano" (Delgado & Melo, 2016, p. 43).

[24] With the second (and last) reform, the educational system became structure as follows: Non-mandatory Pre-school (lasting 4 to 6 six years); 2- Eight years of Mandatory Basic Instruction divided in two cycles of 4 years each; 3- Four years of Secondary Instruction including general and technical instruction tracks; 4- Higher Education; 5- Five Years of Basic Instruction for young adults from the age of 15 and older; 6- Special Education; 7- Distance Education; 8- Extra-school education.

(Portuguese) in the educational context as the exclusive language of instruction, in contrast with the lower status attributed to the mother tongue. Such unequal treatment ignores the fact that the mother tongue is the "language of the heart", bound to the sentimental function of the language as a result of its connection with the relational universe of the speaker (Dabène, 1994, as cited in Lopes, 2016)[25]. This situation generates stereotypes which feed sentiments of linguistic prejudice, which in turn can lead to the depreciation of one's own language through self-prejudice, self-hatred or linguistic disloyalty (Labov, 1976, as cited in Lopes, 2016).[26]

### 2.3.1 Attitudes towards language and their relation to identity construction: the association between language and social prestige

In the bilingual or multilingual contexts, the attitudes demontrasted by speakers towards the languages in play are of paramount importance to help us pin down the stereotypes associated to each language and, in this way, understand the role of the bilingual phenomenon (be it at the individual or social level) in the construction of class, racial or national identity (Calvet, 2002a; Haarman, 1984; Lopes, 2016; Thomason, 2001). This is because, language, identity and linguistic attitudes are intimately connected (Lopes, 2016).[27] Hence, languages have always been associated to social status or prestige, or to the lack of it. When two (or more) languages coexist in a society on unequal basis, there is the tendency for speakers to assume a positive attitude towards the language of greater representativeness, often as a means of personal and social promotion, generating a bilingualism of promotion or

[25] "[…] língua do coração, vinculada à função sentimental da língua como resultado da sua ligação com o universo relacional do falante" (Dabène, 1994, as cited in Lopes, 2016, p. 50).

[26] "São esses estereótipos que sustentam os preconceitos linguísticos, os quais podem levar à depreciação da própria língua (autopreconceito, auto-ódiomou deslealdade linguística)" (Labov, 1976, as cited in Lopes, 2016, p. 50).

[27] "Língua, identidade e atitudes linguísticas estão intimamente relacionadas (Lopes, 2016, p. 55).

of opportunity which in turn, may entail attitudes of resistance to the valuing of the minor language (Dabène, 1994, as cited in Lopes, 2016).[28]

Haarman's (1984, as cited in Garret, 2010) study provides an excellent example of the intimate relationship that exists between attitudes to language and the stereotypes created thereof in relation to its users and to their identity. Haarman was interested in investigating how ethnocultural stereotypes influenced language use in television commercials produced in Japan. The author had observed that Japanese media used foreign languages such as English and French alongside Japanese to advertise products. One could argue that the bilingual advertisements were pointless in this context because social interactions in Japan were chiefly monolingual (Japanese) and many Japanese people would not understand the foreign languages used the advertisements. Besides, almost the totality of the advertisements aimed at Japanese products. The point in all this is that the foreign languages often anchor certain attributes that people associate to the countries where they are spoken.

For instance, French was associated with "high elegance, refined taste, attractiveness, sophisticated lifestyle, fascination and charm" (Haarman, 1989, p. 11, as cited in Garret, 2010, p. 143) and was advertised with products like fashion items, perfume, make up, or tasty food. English, on the other hand, was regarded as a symbol of "international appreciation, reliability, high quality, confidence, practical use, practical lifestyle" (Haarman, 1989, p. 11, as cited in Garret, 2010, p. 144) and was advertised with alcoholic drinks, television sets, sportwear, or motor scooters. Japanese, the native language, was regarded as neutral, not associated to any prestigious product. The situation described here an excellent illustration of the tendency to downgrade the minor language (or the one with lower status) in favor of the

[28] "A atitude positiva para com a língua maioritária, com base na importância objectiva (ou presumida) que lhe é reconhecida, como meio de promoção pessoal e social, gerando um bilinguismo de promoção ou de oportunidade que, por sua vez, pode acarretar atitudes de resistência a acções de valorização da língua minoritária" (Dabène, 1994, as cited in Lopes, 2016, p. 50).

major one (or which has a higher status), even when the former is more representative of the cultural identity of the speaker (Lopes, 2016).

With respect to oral languages (which is still the case of CVC), its speakers may feel that a language that lacks a writing system "is not a 'real' language. They may feel shame when other people hear their language" (SIL International, 2018, "Language attitudes", para.1). Historically, CVC has been through stages when the language suffered great prejudice during the colonial times. Pereira (2006) reports that, in the 19th century, when formal instruction in Cape Verde was about to be introduced, several demeaning ideas were disseminated against CVC leading to the prohibition of its use in public places.

Despite reactions against this measure, the negative attitudes remained and continued to be spread in the following centuries. In 1921, the colonial government prohibited the use of CVC in all public services, threatening noncompliants with disciplinary penalties (Pereira, 2006). In 1932, D. Henrique Central High School issued an internal regulation explicity stressing this prohibition (Brito-Semedo, 2006). Even in the present day, there are many Cape Verdeans who look down on CVC and don't even consider it a language, but "a dialect of Portuguese, or, as some would have it, badly spoken Portuguese" (Stewart, Irwin, & Wilson, 2017, p. 38).

In sum, positive and negative attitudes towards one's own language constitutes both a reflection and a reinforcement of the societal treatment conferred upon the languages in play. In the bilingual context, the celebration of the language of greater prestige and the depreciation of the minor language may lead to the shaping of a distorted identity attached to erroneous beliefs about the cultures and societies where the major language is spoken. For Martins (1994a, cited in Lopes, 2016), this problem can only be solved if and when the speakers of the minor language are able grant it a higher social status. Governmental and

political support are seen by the author as vital in this process, which may entail its introduction in formal instruction as an autonomous discipline or as a language of instruction (Martins, 1994a, as cited in Lopes, 2016).[29]

### 2.3.2 The teaching of English as a foreign language in Cape Verdean schools: the challenges of learning a third language

In Cape Verde, until 2016, EFL teaching used to begin at the secondary school level (7th grade), when students were around 12 years of age. With the latest reform of the educational system that took place in 2017, some adjustments were made to the curriculum plan, and the teaching of EFL has now been introduced in the 5th and 6th grades, allowing students to begin their first formal contact with English in public schools at the age of 10 or 11. However, there are several private English schools spread around the country that offer courses for people of all age groups and at different levels of proficiency. Many students, whose parents can afford to send them to private schools, have their first formal contact with English long before they start learning it at the public schools.

Concerning L3 English learning in a multilingual context, it is important to stress that the learning of a third language has been regarded as a qualitatively different experience from the learning of a second language (Cenoz, 2008; Rothman, 2015; Rothman et al., 2015). According to Cenoz (2008), the bilingual experience imbues the learners with processing strategies developed when learning the first and second languages which can facilitate the learning of the third language, depending on whether there are shared linguistic features (e.g. lexicon and structure) or not between the languages in question. This situation poses a

[29] "Para essa autora [Martins, 1994a], esse conflito será resolvido se e quando os falantes da língua minoritária lhe atribuírem um estatuto social mais elevado, o que pode passar pelo apoio institucional, governamental e político que lhe for conferido, mormente a sua introdução no ensino formal como disciplina autónoma e como língua de ensino" (Martins, 1994a, as cited in Lopes, 2016, p. 51).

fundamental research question in the field of third language acquisition (TLA)[30] and which is also one of the central questions in this dissertation: which language (L1 or L2) plays a stronger role in the learning of a third language?

In general, there is a tendency to consider the L1 as detrimental to the learning of an additional language, be it an L2 or and L3 (Jarvis and Pavlenko, 2008). This situation may have a relation with the worldwide spread of the Communicative Method which endorses the monolingual approach (see Krashen, 1981; Ellis, 1985) EFL teaching. The monolingual approach holds that teaching should happen entirely in the target language for its effective learning. In the Cape Verdean educational context, teachers tend to follow this view and it is frequent to find EFL teacher trainees being recommended by their supervisors to avoid the L1 (CVC) and the L2 (EP) in the classroom and maximize the use of the target language (L3 English). Nevertheless, there are moments during the teaching process when it becomes necessary to use a language other than the TL for clarification purposes (this is frequent with beginner level learners). When that happens, L2EP (and not the L1CVC) tends to be the default support language. This can be explained by the fact that the L2EP is the only official language used in Cape Verde in formal situations as is the case of school settings.

The monolingual approach, however, has been criticized by many researchers (see Atkinson 1987; Bhooth et al, 2013; Sharma 2006; Storch & Wigglesworth 2003; Swain & Lapkin, 2000) and educators alike who advocate for the role of the source language (L1 or L2) in the foreign language classroom. According to Bhooth et al (2013) "there is no empirical evidence that L1 has an impeding role in the EFL/ESL classroom in non-native environments especially" (p. 77). Therefore, researchers who investigate cross-linguistic

[30] The term *third language acquisition* (TLA) has been used interchangeably with L3 acquisition in the literature (e.g. Bardel & Falk, 2007; Cenoz, 2001; De Angelis, 2007; Flynn, Vinnitskaya, & Foley, 2004, García-Mayo, 2012; Leung, 2007a; Slabakova, 2016). The present dissertation follows this trend and refers to the acquisition of a third language either as L3 acquisition or as TLA.

influence (CLI) or transfer today have been interested in finding out "to what extent prior linguistic knowledge has a facilitative or inhibiting effect on learning" (Ringbom, 2007, p. 30).

While the L1 has been, for a long time, considered as the main source of transfer in the acquisition of a third language (Hermas, 2010; Hufeisen, 1991[31]; Jin, 2009; Na Ranong & Leung, 2009), normally for the negative reasons, more recent studies have proposed that the L2 might play a greater role than the L1 (ex. Cenoz, 2001; Dewaele, 1998; Hammarberg, 2001; Williams & Hammarberg, 1998), depending on factors such as language distance, stage of learning (proficiency), metalinguistic awareness, recency of use, and length of stay in the native and target language context (García-Mayo, 2012). One strong claim is put forth in the model of multilingual transfer named the L2 Status Factor[32] (Bardel & Falk, 2007; Falk & Bardel, 2011). Overall, the model suggests that, at the initial stages of L3 acquisition, "the language that was learned just prior to the target language is the most likely candidate for transfer" [33] (Jarvis & Pavlenko, 2008, p. 185).

From the perspective of the L2 Status Factor, in the Cape Verdean linguistic context, one would expect that the L2EP, for being the second language would be a more probable candidate for transfer into L3 English among learners at initial stages of L3 acquisition. This likelihood would be reinforced by the fact that formal instruction in Cape Verde occurs exclusively in the L2 (officially). Since these students' educational backgrounds were developed entirely in their L2, and given their low proficiency in the target language, it is

[31] Hufeisen (1991) found that transfer from the L1 to the L3 persisted even when the L2 and the L3 were more closely related to one another (see Wlosowicz, 2012, p. 146).

[32] This model will be discussed in more detail in Chapter IV.

[33] This claim will be tested in the present dissertation.

likely that they will rely on the L2 to support L3 learning, according to the L2 Status Factor's view.

Concerning more advanced learners whose L3 linguistic properties have been sufficiently consolidated to allow the testing of processing strategies at the implicit level, it is likely that the L1CVC, for being the less preferred language in formal environments (which might lead to its conscious inhibition), plays a significant role to facilitate L3 processing of similar structures (e.g. datives), according to the prediction of the inverse preference effect (Pickering & Ferreira, 2008). This effect has been widely observed in syntactic priming research (e.g. Bernolet & Hartsuiker 2010; Bock 1986; Ferreira 2003; Jaeger & Snider 2007; 2013; see Branigan & Pickering, 2017 for a review). Therefore, the lingering question is whether Cape Verdean L3 English learners rely more on the L1CVC or on the L2EP in the processing and acquisition of L3 dative structures, under comparable conditions. This and other questions in relation to bilingual syntactic processing and L3 acquisition/learning will be tackled in the following chapters at both implicit and explicit levels. To start, the next chapter will look into L3 English processing from an implicit perspective, through the studies developed within the syntactic priming paradigm.

# CHAPTER III

# BILINGUAL SYNTACTIC PROCESSING

Although the present dissertation is concerned with multilingual processing, the theoretical bases of the field often stem from the established fields of bilingualism and second language acquisition (SLA). It has even been suggested that "there is no need to develop a specific model for […] multilingual processing" (De Bot, 2004, p. 17), since existing models of bilingual processing can hold for additional languages. Consequently, "most conclusions that are drawn about multilingual processing are in fact solely based on bilingual processing" (van den Noort, Struys, Kim, Bosch, Mondt, van Kralingen, Lee, van de Craen, 2014, p. 182).

That being said, the present chapter starts with section 3.1 with some relevant models of language processing proposed in the field of experimental psychology in relation to bilingualism. This is followed by section 3.2 which will introduce the syntactic priming paradigm, which that has been paramount to create an understanding of the implicit mechanisms underlying bilingual language processing and representation (Loebell & Bock, 2003; Branigan & Pickering, 2017). The section opens by introducing the dative constructions – which constitutes the object of study in the present dissertation – and the prevalence of the dative alternation (double-object/prepositional object) in syntactic priming research. The discussion follows with section 3.3 and the question of whether syntactic representation and processing among bilingual speakers is shared or separate. The topic is addressed in the light of studies that have investigated cross-linguistic syntactic priming in production and in comprehension. Finally, section 3.4 closes the chapter with a discussion about the lexicalist and structural accounts underlying syntactic priming within and across languages.

## 3.1 MODELS OF BILINGUAL SYNTACTIC PROCESSING

Among the most important models that have been proposed in the literature in relation to bilingual syntactic processing, three are of particular interest for the present study because they discuss the underlying mechanisms that are involved in cross-linguistic influence, thus, making predictions about L1 and L2 processing and interaction: the Bilingual Production Model presented by Kees De Bot (1992); the Declarative/Procedural (DP) Model of lexicon and grammar proposed by Michael Ullman (2001); and the Competition Model advanced by Elizabeth Bates and Brian MacWhinney (1982, 1989).

Drawing from Levelt's (1989) 'Speaking' model[34] originally designed as an attempt to explain monolingual language processing, De Bot (1992) developed an adapted version and called it *The Bilingual Production Model*[35]. The adaptation of the monolingual model was justifiable, "given the fact that bi- or multilingualism is the rule all over the world and unilingualism the exception, especially if we include bidialectism as a form of bilingualism" (De Bot, 1992, p. 2). Therefore, the author concludes that, models should be designed with bilingualism in the foreground and monolingualism in the background, and not the other way around. However, De Bot (1992) regarded Levelt's model "as very promising in all respects" because it was founded on strong empirical basis resulting from "several decades of psycholinguistic research" and "observation of speech errors" (p. 2). Therefore, De Bot's (1992) adaptation preserved the essential components of Levelt's original model.

[34] For economy purposes and straightforwardness, an isolated description of Levelt's model is beyond the scope of the present dissertation. Its basic components may be inferred from the description of De Bot's (1992) adapted version.

[35] Given the complexity of the model's design in an attempt to account for all of the linguistic aspects involved in speech perception and production (e.g. phonological encoding and articulation), our description of the model will be focused on its syntactic components or closely related aspects that inform cross-linguistic syntactic interaction.

Like its prototype, De Bot's (1992) 'Speech Production' model is made up of three information stores: the communicative intention (conceptual features), the syntactic procedures, and form elements (sounds, syllables, or gestures). There is only one lexicon with two separate subsets, one for each language. Interaction between the three stores is mediated by three components: lexical concepts, lemmas, and lexemes[36]. At the basis of the three stores and their subsets, it is possible to observe the fundamental change that De Bot operated in Levelt's model: the introduction of an external language node to control the different processing components so that, when the speaker intends to use a particular language, the language node communicates the intention to the components in charge of selecting syntactic or form information.

This job can also be performed through the lemmas, which relay to the syntactic procedures after being informed by the lexical items. Yet, the syntactic procedures do not respond directly to the lemma. Instead they "report" to the language node which then redistributes to the entire system. According to De Bot (1992), "within the lemma, meaning and syntactic information may not be inextricably linked. The different formulators submit their speech plan to an articulator [the language node] which is not language specific and which stores the possible sounds and prosodic patterns of the languages" (p. 21). These interactions are illustrated in Figure 1 below:

[36] Lemmas are abstract concepts of words that allow us to create a mental representation for those words. Lemmas are also understood as the canonical dictionary form of words. Lexemes are forms of a lemma which carry the same meaning. They may (or not) contain inflectional morphemes. For instance, *go* is an example of lemma while *go, goes, going, gone,* and *went* are forms of the same lemma (see Jarvis & Pavlenko, 2008, p. 82).

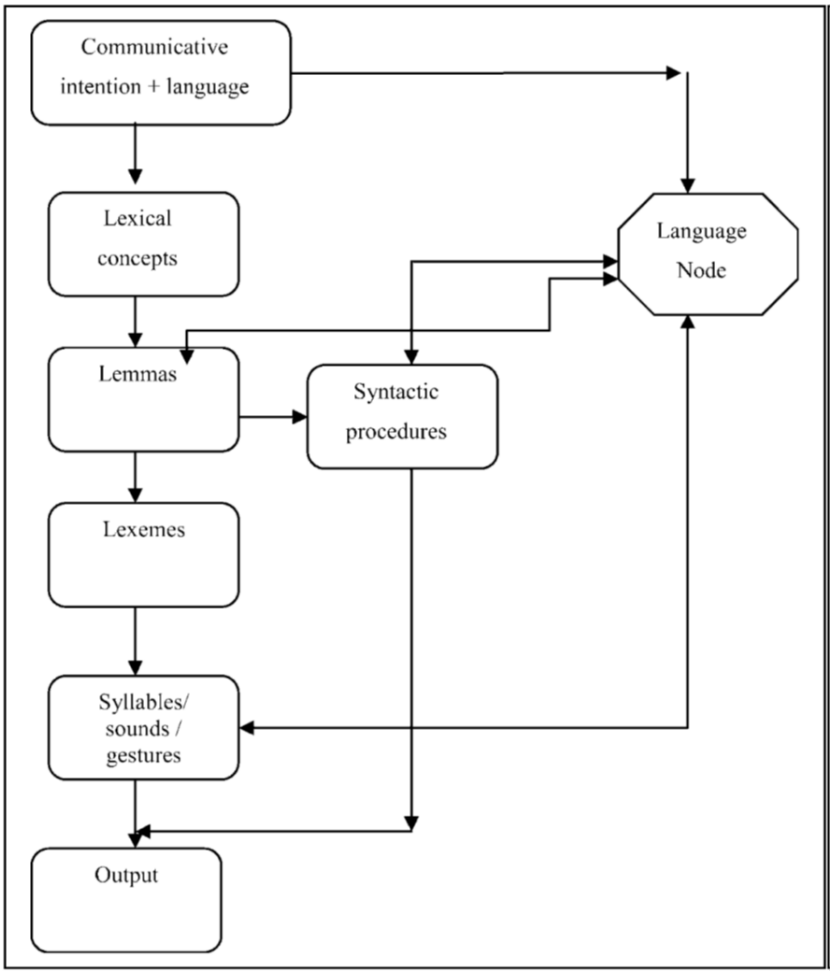



*Figure 1.* A simplified version of De Bot's (1992) Bilingual Production Model (De Bot, 2004)

All in all, the system's functioning is entirely controlled by the language node which ensures the interaction of the separate components. This is extended at the syntactic level, where representation of grammatical knowledge of each of the bilingual's two languages is thought to be separate (though interacting) [37] as a result of the partition of a single lexicon into two subsets. However, De Bot admits that knowledge of the two languages may also overlap, depending on factors like linguistic distance and proficiency. That is, if the languages are closely related, the bilingual speaker would use "the same procedural or lexical knowledge when speaking either of the two languages" (p. 9). Similarly, a speaker cannot possibly

[37] This *separate, yet interacting syntatx account* is challenged by Hartsuiker, Beerts, Loncke, Desmet, and Bernolet's (2016) syntactic priming study in production, which will be discussed later in this chapter.

develop a separate representation for a language in which he only knows a few words and expressions. In this case, the native language system will absorb the registers of the foreign language.

The second model related to bilingual syntactic processing proposed in this section is the Declarative/Procedural (DP) model by Ullman (2001). The model describes two long-term memory systems in the brain which are involved in L1 and L2 language acquisition and processing: the declarative memory (also known as lexical memory) and the procedural memory. The declarative memory is concerned with knowledge about facts and events and it is essentially explicit (available to conscious awareness). It is associated to late-learners of a language, who will more likely process linguistic features (e.g. lexicon and syntax) in a conscious manner. According to Ullman (2013), "the [declarative] system may be specialized for learning arbitrary bits of information and associating them" (p. 160). Thus, knowledge in this system is acquired in a fast manner, including knowledge of sequences and rules and simple words, irregular morphology, syntactic complements, etc, which are memorized and stored in the mental lexicon[38]. Because it is consciously operated, the declarative memory improves as the learner grows into adulthood and becomes more aware of the linguistic features of the language in use.

Procedural memory, on the other hand, is implicit and, concerning language learning, it relates to knowledge that is automatized through early linguistic exposure. So, for example, the lexical and syntactic rules governing the language use are learned unconsciously. Ullman (2013) states that the system "can underlie the rule-governed sequencing of complex forms (…) including phonology, morphology, and syntax" (p. 161). However, unlike the declarative

[38]According to Ullman (2013) "complex forms can also be learned and processed in the declarative memory, for example as chunks ('walked,' 'the cat'). Thus complex forms can rely on either memory system" (p. 161).

memory, procedural memory may weaken in time, so learning and consolidation of new knowledge declines. This weakening has been associated to *a critical period*[39] for L2 acquisition which is referred to as a stage of linguistic development in which our brain plasticity bestows our sensory systems greater sensitivity to external stimuli, particularly, auditory and acoustic information that can be encoded into higher-order aspects of language (e.g., Johnson & Newport, 1989; Kuhl, 2010, as cited in White, Hutka, Williams, & Moreno, 2013). Past this stage, the acquisition of an L2 will eventually become more and more effortful, and reliance on the declarative memory will be gradually increased.

In sum, the DP model postulates that the grammar of the L2 (as well as the grammars of all late-acquired languages) is stored and processed in the declarative memory (explicit), whereas the grammar of the L1 is stored and processed in the procedural memory (implicit)[40]. The two memory systems interact cooperatively and competitively in the learning of linguistic information. The systems cooperate when, in the early stages of language learning, the complex forms of that language are learned explicitly, and the grammatical rules are learned implicitly. Conversely, the systems compete when reliance on declarative memory decreases gradually as the learner becomes more familiar with the complex forms of the language being learned and the knowledge becomes proceduralized. In this sense, the attenuation of one

[39] Although the terms "critical period" and "sensitive period" are sometimes used interchangeably in the literature there is an important distinction that should be made between them. Critical period entails "short and sharply defined windows-of-opportunity during which exposure to environmental input causes irreversible changes in brain function and structure, whereas *sensitive periods* involve gradual shifts in sensitivity to environmental input outside of which learning is still possible" (White, Hutka, Williams, & Moreno, p. 1).

[40] This modular view concerning the storing and processing of the L1 and of the L2 has been challenged by recent fMRI and ERPs studies dealing with L2 acquisition (see Abutalebi, 2008, for a review). Abutalebi (2008) claims that "overall both low and high proficiency bilinguals engage for L2 the same neural structures responsible for grammatical processing in L1" (p. 470), which means that L2 acquisition is mediated by an existing network used in the processing of the L1. This claim provides support for a shared linguistic representation of the L1 and of the L2 and, hence, shared syntax. This issue will be discussed in the next section which deals with the syntactic priming paradigm.

system is accompanied by the accentuation of the other. This process, however, will depend on the frequency/amount of exposure to the target language, among other factors.

Lastly, another important model of bilingual processing is the Competition Model (Bates & MacWhinney, 1982, 1989; MacWhinney, 2005). Relying on functionalist and connectionist views on first and second language learning, the model was proposed as a theory of crosslinguistic sentence processing for which language development is a result of learning and transfer. According to Jarvis and Pavlenko (2008), "most of the research on syntactic transfer in comprehension and sentence interpretation has been conducted within the framework of the Competition Model" (Jarvis & Pavlenko, 2008, p. 97).

The Competition Model's main claims are based on four major theoretical accounts: lexical functionalism, connectionism, input-driven learning, and processing capacity. Lexical functionalism attributes the forms of language (words, phrases, etc) to the "pressure of communicative function", i.e., the communicative purpose that drives the use of a specific word or phrase at a specific moment. According to MacWhinney (2015) this pressure exerted by the communicative function, which operates under the executive control of neurolinguistic processing, is the primary responsible for language development, processing, and evolution. Connectionism postulates that underlying all mental processes there is a single set of cognitive structures that are interconnected and, hence, help to explain transfer from L1 in second language learning. Input-driven learning focuses on the role of the input to provide language cues that the learner will identify in order to make plausible distinctions between aspects of the L1 and of the L2. Finally, processing capacity is related to the constraints that short-term verbal memory (Baddeley, 1986; Gupta & MacWhinney, 1994; Potter, 1993) poses on the continual use of language in real time. MacWhinney (2015) states that "together, these four commitments comprise an integrated, minimalist approach that allows us to interpret

experimental data with the fewest possible theoretical assumptions and without reference to assumptions that cannot be directly related to observed linguistic, neurological, and experimental facts" (p. 115).

At the heart of the four above described theoretical components (or commitments, as the author puts it) that sustain the Competition Model is the assumption that, when learning multiple languages, learners draw on surface cues such as word order, inflectional morphology, and semantic features that signal meaning in each language before they are able to successfully interpret sentences on the basis of similarities and differences between the languages involved, particularly concerning agent-patient relationships among noun phrases. Therefore, a successful interpretation of the sentences depends on the accurate weighing of those cues. Since different languages use different cues to signal meanings, learners should be able to identify the cues that are important in the different languages at stake.

As a way to illustrate the idea of cues in syntax, let us take the examples of three distinct languages suggested in Jarvis and Pavlenko (2008): English, Italian and Japanese. While in English, people tend to rely primarily on word order to determine the subject and the direct object, Italian speakers favor subject-verb agreement, and Japanese speakers are more concerned with whether the noun is animate or inanimate. MacWhinney (2015) concludes that "the second language learner begins learning with a parasitic lexicon, a parasitic phonology, and a parasitic set of grammatical constructs" (p. 119). This situation will determine positive transfer or negative transfer from a source language to a target language. Hence, from the syntactic point of view, if the L1 and the L2 share similarities in their syntactic structures, processing strategies in the L2 are mediated by the L1, resulting in positive transfer. Conversely, if the L1 and the L2 have different syntactic structures the result is negative transfer.

For Jarvis and Pavlenko (2008), however, “one of the primary purposes of L1 use in the foreign language classroom is to facilitate positive transfer and the internalization of new concepts and to raise awareness of negative transfer through cross-linguistic comparisons.” (p. 217). The authors mention numerous studies which have been carried out within the framework of the Competition Model counting with bilingual and second language learner participants from diverse L1s and L2s (e.g., Gass, 1984; Harrington, 1987; Heilenman & McDonald, 1993; Kilborn, 1989; Sasaki, 1991, 1994; Su, 2001, as cited in Jarvis & Pavlenko, 2008) and whose results “have shown quite consistently that learners do rely on the preferred cues from their L1s while interpreting agent–patient relationships in their L2s” (Jarvis & Pavlenko, 2008, p. 98). However, it is important to emphasize that the extent to which their L1s influence their interpretations is determined by certain factors, such as proficiency level in the target L2. The greater the L2 proficiency level, the less likely it is for learners to rely on their L1 as they are able to weigh the L2 sentence cues more accurately and processing occurs implicitly.

Therefore, proficiency level in the L2 happens to be an essential aspect that allows the investigation of cross-linguistic mental interactions at the implicit level among bilingual speakers. To this end, adequate tasks are required, which can tap into implicit processing processing strategies and foster a better understanding of the organization of linguistic representation in the bilingual brain. Some of these tasks are available within the syntactic priming paradigm. The next section introduces this paradigm which supplies the main research tools used to conduct the field investigation in the present dissertation.

## 3.2 CROSS-LINGUISTIC SYNTACTIC PRIMING

Also referred to as structural priming or structural persistence (see Bock, 1986; Pickering & Ferreira, 2008), syntactic priming is understood as an unconscious tendency to

repeat the syntactic structure that has been recently processed and/or produced when processing and/or producing subsequent sentences. According to McDonough and Trofimovich (2009), "it is easier for speakers to access a syntactic structure that has been recently processed than to access a completely new structure" (p. 99). This is because recently used structures are more readily accessible in the memory than other alternative structures (Bock, 1986; Branigan, Pickering, McLean, & Cleland, 2007; McDonough, 2006; Loebell & Bock, 2003; McDonough & Trofimovich, 2009; Schoonbaert, Hartsuiker & Pickering, 2007; Shimpi, Gámez, Huttenlocher, & Vasilyeva, 2007; Shin & Christianson, 2009). Hence, they create a facilitatory effect in processing that can be observed in comprehension and production. For example, after being exposed to a prepositional object (PO) dative (e.g., *The student gave an apple to the teacher*) there is a greater probability that the person will use that same structure in a subsequent utterance (e.g. *The lawyer granted his client a contract*) than the alternative double-object (DO) structure that would be equally acceptable.

The first formal inquiry of syntactic priming is usually traced back to Bock's (1986)[41] pioneering study aiming at investigating the role of activation processes on language performance among native speakers of American English. Bock was investigating theories about the mechanisms of language that would help to explain her observation that people consistently tended to reuse sentence structures that they previously heard. Documented cases had involved sounds and words which, by way of unconscious activation processes, interfered in speech production resulting in slips of the tongue such as, "Get out of the clark!", when the

[41] Although Kathryn Bock was the first to introduce the term "syntactic priming", the phenomenon had been investigated earlier by Levelt and Kelter (1982). In a naturalistic conversation, they introduced the same question to Dutch shopkeepers in either of the two forms, *At what time does your shop close?* or *What time does your shop close?*, having observed a consistent tendency for the use or omission of the preposition in the shopkeepers' answers *Five o'clock* or *At five o'clock*, following the use or omission of the preposition in the original question. Likewise, Bock (1986) reported a finding from Weiner and Labov (1983) who had demonstrated in sociolinguistic interviews that "one of the factors that is significantly associated with the occurrence of a passive utterance is the presence of another passive somewhere in the previous five utterances" (Bock, 1986, p. 357).

speaker intended to say "Get out of the car!", but ended up switching words while seeing a sign on a store front with the word "clark" on it (Bock, 1986, p. 356).

In a similar vein, Bock questioned whether the same involuntary activation processes that triggered these speech errors in everyday language use could also be behind the repetition of syntactic structures across consecutive sentences. Bock conducted a language production experiment with adult monolingual speakers of American English using a picture description task with transitives (actives and passives) and datives (double-objects and prepositional objects). Participants heard and repeated the prime[42] sentences out loud before describing a semantically unrelated target[43] picture. In the end, Bock found that the participants' descriptions were clearly influenced by the structure presented in the prime sentences. A post-experiment briefing ensured that the participants were not aware of the linguistic structures under investigation.

Ever since Bock's seminal study, the syntactic priming paradigm has been used with different populations including children, adults, and people with special needs (Kuerten, 2017; see also Pickering & Ferreira, 2008), in different languages and syntactic structures, and in different modalities (see Hartsuiker et al., 2016). Syntactic priming effects have been found in language production (e.g. Bock, 1986; Branigan, Pickering, McLean, & Cleland, 2007; Loebell & Bock, 2003; Pickering & Branigan, 2008) as well as in language comprehension (e.g. Arai, van Gompel, & Scheepers, 2007; Branigam, Pickering, & McLean, 2005; Ledoux, Traxler, & Swaab, 2007), though in this case the effects have been largely

[42] Primes are the stimuli, which can be single words (e.g. verbs), phrases, or sentence structures that are used to facilitate the processing and production of related words, phrases, or sentence structures.

[43] Targets constitute the verbs, phrases, sentence structures or pictures denoting a speficic event to be described with words, phrases, or sentences. The targets are where the effect of the primes are observed and measured.

dependent on lexical repetition[44] (see Cleland & Pickering, 2003; Felício, 2018; Ledoux, Traxler, & Swaab, 2007; Pickering & Branigan, 1998; Tooley & Traxler, 2010). It has also been found between comprehension and production (Bock, Dell, Chang, & Onishi, 2007), in writing (Pickering & Branigan, 1998; Branigan, Pickering, & Cleland, 1999), and between speaking and writing (Cleland & Pickering, 2006). Among the different structures used in syntactic priming research, dative constructions have received particular attention, especially in production studies, due to the issue of verb bias which opens several avenues of research. The following section presents an overview of the dative alternation which constitutes an essential feature for the purposes of the studies developed in present dissertation.

## 3.3 THE DATIVE ALTERNATION IN SYNTACTIC PRIMING RESEARCH

Dative constructions include DO constructions (e.g. *John gave Mary a rose*) and prepositional object PO constructions (e.g. *John gave a rose to Mary*). They have been pervasive in syntactic priming research (see Branigan et al., 2006; Loebell & Bock, 2003; McDonough, 2006; McDonough & Trofimovich, 2009; Schoonbaert et al. 2007) due to their dual-meaning syntactic structures. They allow researchers to find out if exposure to one specific syntactic form (the stimulus) influences the participant's production of similar forms (response) in the target language (McDonough & Trofimovich, 2009). The speaker normally favors one structure over the other.

In American English, DO constructions have a higher frequency than PO constructions (Bernolet & Hartsuiker, 2010; Bock, 1989; Bock & Griffin, 2000; Kutta, Kaschak, Porcellini, & Jones, 2017). However, when it comes to British English, Kutta et al. (2017) mention corpus studies that have suggested that the British do not have a DO preference and that,

[44] Ledoux et al. (2007) observe that "priming effects have been less consistently demonstrated in comprehension than in production, and those that have been reported [in comprehension] have depended on the repetition of verbs across sentences" (p. 135).

instead, they *may* have a PO preference (see Kutta et al., 2017, pp. 3-4). Yet, in Kutta et al.'s (2017) syntactic priming study, the British English participants showed no preference for either the DO or PO contruction in the baseline/pre-bias phase (their choices split 50/50) and, surprinsingly, there was no cumulative priming effect for the DO and there was a cumulative priming effect for the PO, which suggests that the PO is the least preferred structure, in accord with the *inverse preference effect* (Pickering & Ferreira, 2008). Hence, as far as the English language is concerned, the PO is a marked structure, whereas the DO is the default form.

In this respect, it is worth mentioning that the Ditransitivity Hierarchy proposed by Croft, Barddal, Hollmann, Nielsen, Sotirova, and Taoka (2001) and later expanded by Malchukov et al. (2007), Rappaport Hovav & Levin (2008), etc, advocates for a lexically motivated dative structure due to the use of verbs from one of the three verb classes ('give', 'send', and 'throw'). For example, *give*-type verbs (e.g. 'give', 'hand', 'pass', 'sell', etc) select for DO constructions as they lexicalize caused possession (*x* causes *y* to possess *z*, being *y* a recipient and *z* a theme), whereas *send*-type verbs ('mail', 'send', 'ship', etc) and *throw*-type verbs ('kick', 'throw', 'toss', etc) are normally more fond of PO constructions as they lexicalize caused motion (*x* causes *z* to be at *y*, being *y* a spatial goal), even though they can also be found with DO constructions lexicalizing caused possession.

As it had been shown in the previous section, the idea of verb-bound preferences in structuring sentences is also a strong line of inquiry in syntactic priming literature. Despite the fact that some dative verbs carry an alternation bias (i.e., they are strongly attached to a given syntactic structure), in a syntactic priming experiment the alternation bias of a target verb can shift to that of the verb used in the prime sentence. For example, even though *give*-type verbs are more common with DO constructions in English, when used after PO prime sentences these same verbs are more likely to elicit the production of prepositional-objects than double-

objects. This effect has been termed as *the inverse preference effect* (Pickering & Ferreira, 2008) or as the *surprisal-sensitive persistence* (Jaeger & Snider, 2007). It has been found in several syntactic priming studies dealing with sentence production involving different languages (e.g. Bernolet & Hartsuiker, 2010; Ferreira & Bock, 2006; Jaeger & Snider, 2007; Salamoura & Williams, 2006; Scheepers, 2003; Segaert et al., 2014).

For instance, in a picture description experiment with Dutch participants, Bernolet and Hartsuiker (2010) tested the hypothesis that the strength of syntactic priming is modulated by verb alternation bias. Their baseline phase showed that dative constructions in Dutch are strongly biased towards the PO (76%). In the primed conditions they paired prime verbs and target verbs (printed underneath the picture) which were unrelated and which had opposite syntactic preferences. They found that prime verbs with a DO preference (DO-prime condition) decreased the production of PO constructions to 64% against the initial 76% found in the baseline.

Conversely, prime verbs with a PO preference (PO-prime condition) increased the production of PO constructions from 76% (baseline) to 80%. Although the authors report significant priming effects in both prime conditions, the effects were much stronger in the DO-prime condition than in the PO-prime condition (DO-prime = $p < .001$; PO-prime = $p < .05$). The authors interpreted the findings as providing evidence against the residual activation account (Pickering & Branigan, 1998) "because the strengthening of a specific verb-combinatorial node link only influences the production preferences of that specific verb (and not of other, unrelated verbs)" (p. 460). Hence, the authors claim that their findings support the error-based implicit learning account (Chang et al., 2006) since the model "keeps track of the different verb-structure combinations it encounters and bases its structural

predictions on error-based learning" (p. 460). In this way, the model can predict the effects of prime alternation bias found in the experiment.

Bernolet & Hartsuiker's within-language (Dutch) experiment can be expanded in the present dissertation since the languages involved in the study have dative verbs that select for only one structure. As explained in the introductory chapter, L1CVC only allows the DO construction (with the exception of the verb *manda,* which accepts the PO). For example, it is possible to say *Djon dâ Maria un livru*, 'John gave Mary a book', but it is ungrammatical to say *Djon dâ un livru pa Maria*, 'John gave a book to Mary'. In L2EP only the PO construction is acceptable (e.g. *O João deu um livro à Maria*, 'John gave a book to Mary'), hence it is ungrammatical to say *O João deu Maria um livro,* 'John gave Mary a book'. The syntactic priming technique may help to verify if the syntactic preference of the prime verbs in L1CVC and in L2EP has any effect on the production of DO and PO constructions in relation to the baseline condition (unprimed).

Likewise, in comprehension, the status of the dative verbs in L1CVC and in L2EP will allow the testing of their influence in the processing of English dative structures. L1CVC primes are expected to facilitate processing in L3English DO constructions, resulting in a decrease of processing time from prime to target. L2EP, on the other hand, is expected to yield similar outcomes for the PO constructions. Yet the strength of the syntactic priming effects will depend on the participants' preferred structure. Stronger effects are expected for the less preferred structure, according to the predictions of the inverse preference effect (Pickering & Ferreira, 2008) and the surprisal-sensitive persistence (Jaeger & Snider, 2007). Any effects found support the idea of an interaction between the syntactic representations in the bilingual brain. The following section discusses the shared vs. separate syntax dichotomy.

## 3.4 BILINGUAL LINGUISTIC REPRESENTATION: SHARED OR SEPARATE?

In bilingual research, an important question that has been investigated has to do with the way in which L1 and L2 syntactic information is represented and processed in the brain. According to Branigan and Pickering (2017), understanding the way languages are represented in the mind is vital for the development of psycholinguistic theories of language acquisition "because people must represent linguistic structures to use language" (p. 7). Syntactic priming has been increasingly used in the last two decades to investigate the role of structural repetition in language acquisition among bilinguals and, in this way, achieve a better understanding of the nature of linguistic (syntactic) representation. Two opposing views have been proposed in an attempt to explain how bilinguals represent syntax: the *separate-syntax account* and the *shared-syntax account* (McDonough & Trofimovich, 2009).

The separate-syntax account posits that bilinguals have two separate language systems to store linguistic information for each language. This suggests that even if two languages have similar syntactic structures, they would be processed independently. One implication of this account is that the bilingual speaker only uses one language at a time, which would be efficient in a conversation since the features of one language would not interfere in the other language which has been eventually switched off. In this way, "cross-language priming would not occur[45], since activation of linguistic information in one language would not affect the linguistic information of the second language" (McDonough & Trofimovich, 2009, p. 108).

The shared-syntax account, on the other hand, defends that if the two languages spoken by a bilingual have a similar structure, at least some syntactic information is shared (McDonough & Trofimovich, 2009; Weber & Indefrey, 2009). This would allow bilinguals to

[45] A variant of the separate-syntax account is the *separate, interacting syntax account* (De Bot, 1992) which predicts that although the bilingual's two languages are represented in different memory systems, they can still influence each other. The degree of this influence would depend on the etymological distance between the languages and on the L2 proficiency level of the speaker.

activate recently accessed structures more effortlessly in the other language when code-switching, something which would be cognitively more costly if the two linguistic representations were stored separately. Hence, this account predicts the occurrence of cross-linguistic priming since "activation of syntactic structure in one language would facilitate production of the related structure in the second language" (McDonough & Trofimovich, 2009, p. 108).

A growing amount of research has been carried out over the last three decades through the employment of the syntactic priming paradigm in the language production modality, attempting to investigate the *separate-syntax/shared-syntax* dichotomy, in particular and cross-linguistic transfer in general[46] (Bernolet, Hartsuiker & Pickering, 2007; Hartsuiker, Pickering, and Veltkamp, 2004; Hartsuiker et al. 2016; Loebell & Bock, 2003; Melinger & Dobel, 2005; Salamoura & Williams, 2007; Segaert, Menenti, Weber, Petersson, & Hagoort, 2012; Schoonbaert et al., 2007). The discussion opens with cross-linguistic studies that have been developed in language production and then moves on to those in the comprehension modality.

### 3.4.1 Cross-linguistic syntactic priming in production

On a seminal cross-language syntactic priming study, Loebell and Bock (2003)[47] investigated whether syntactic priming in language production could be observed across languages and, if so, what implications it would have for language processing and representation, language development, and language change. The authors compared the use of

[46] It is noteworthy though that, since 1986, the great majority of the cross-linguistic syntactic priming studies have been carried out with monolingual speakers during production (McDonough & Trofimovich, 2009; Pickering & Ferreira, 2008; Weber & Indefrey, 2009). Researchers' interest in cross-linguistic syntactic priming awakened much later (starting in 2003 with Loebell and Bock's seminal paper titled "Structural priming across languages") and, even among these studies, the production modality has been copiously predominant, while studies in the comprehension modality remain scant.

[47] In the present dissertation, the design of the syntactic priming task to test the productions of dative constructions was adapted from Loebell and Bock (2003).

DO and PO constructions and the use of actives and passives among fluent L1 German- L2 English bilinguals in both directions (L1 German to L2 English and L2 English to L1 German), and within L1 German. They used the picture description task to test the productions of syntactic constructions in the target language after participants had been exposed to similar constructions in the other language (the prime condition). The English sentences (primes and fillers[48]) were translated into German for the German-English condition.

In each trial, the prime sentence in either of the alternative structure dative or transitive structure (e.g. dative: *The girl bought a newspaper for the blind woman. / The girl bought the blind woman a newspaper.* ; transitive: *The engine turned the wheel slowly / The wheel was turned slowly by the engine*) was always followed by the target picture, which disclosed a thematically unrelated event. The experimental sessions were counterbalanced so that in the first session half of participants were tested with German sentences and English picture descriptions and the other half with English sentences and German picture descriptions. In the second session the procedure was inverted. The experimental sessions were separated by a minimum of one week.

Concerning the results, Loebell and Bock (2003) found priming effects for datives, but not for transitives (actives and passives). Moreover, when the prime was a DO construction, the effects were stronger than when the prime was a PO construction, regardless of the prime language being German or English. The only difference related to language was that there were more prepositional datives produced in English than in German. The transitives, on the other hand, did not yield any priming effects in either direction (German to English or English

[48] Fillers are words, phrases, sentence structures, or pictures that are used to deviate the participant's attention from the linguistic aspects that are under investigation, so that the implicit nature of the priming experiment is preserved.

to German), either in active or in passive constructions. The absence of priming effects in actives is explained by the fact that they constitute the preferred structure for both languages and, consequently, in accord with the *inverse preference effect* (Pickering & Ferreira, 2008), they are not susceptible to priming effects. [49]

Regarding the passives, the absence of priming effects was assumed to have been due to the fact that German and English do not share the same word order for passive structures: in English the *by*-phrase comes before the participle, whereas in German it comes afterwards. Finally, regarding the within-language conditions (L1 German to L1 German), the effects were not significant for either dative or transitive structures, but the authors justify this by the fact that "the power of the within-language study was just half that of the cross-language experiment" (Loebell & Bock, p. 808). This is because the cross-language studies were conducted in both directions, as mentioned earlier. Still, the authors stated that the pattern of results was consistent with similar within-language syntactic priming studies in English that had been developed until then. Nevertheless, based on the priming effects found for the dative constructions, the results were interpreted as providing evidence for a structural source of priming across languages and for "a common psycholinguistic scaffolding for the bilingual phenomena of codeswitching and transfer" (p. 791).

Loebell & Bock's (2003) findings of priming effects for datives were substantiated in Schoonbaert et al.'s (2007) study conducted on language production with the dative alternation among Dutch-English bilinguals. Schoonbaert and colleagues found syntactic priming effects for all language combinations within and between languages (from L1 Dutch to L2 English; from L2 English to L1 Dutch; within Dutch; and within English). However, in

[49] An equivalent hypothesis is the "surprisal-sensitive persistence" proposed by Jaeger and Snider (2007) in which they state that "less expected prime structures are predicted to prime more (i.e. to lead to a bigger increase in the probability of repetition) than more expected prime structures" (p. 27). Put short, syntactic priming is more likely to occur (hence, *sensitive*) with structures that are infrequent (hence, *surprising*) than with those that are frequently used.

this study the priming effects might have been boosted by the introduction of lexical repetition between prime and target: by a verb repetition condition within language or by a translation equivalent repetition condition between languages, more specifically from the L1 Dutch to L2 English. Syntactic priming from L2 English to L1 Dutch was not boosted by the translation equivalent repetition condition, a finding that was interpreted as a demonstration of bilingual asymmetry, i.e., although there is an overlap between the bilingual's two linguistic representations, "the L1 typically has more impact on L2 processing than vice-versa" (Schoonbaert, Duyck, Brystbaert, & Hartsuiker, 2009, p. 570).

Schoonbaert et al.'s (2007) syntactic priming findings with the dative alternation from L1 Dutch to L2 English were not replicated in Bernolet, Hartsuiker, and Pickering's (2007) study, which focused on word order in relative clauses (RCs) in the same language combination. Bernolet and colleagues were intrigued by the hypothesis that word order might have been a factor preventing Loebell and Bock's (2003) study from finding syntactic priming effects between German and English passives. Therefore, Bernolet et al. conducted five experiments within and between languages involving Dutch as the first language, and German and English as the second languages. The goal was to test the role of word order in the occurrence of syntactic priming for RCs. Importantly, Dutch and German share the same word order for RCs, whereas English differs from them. The cross-language experiments were conducted in a single direction, L1 to L2, but not from L2 to L1.

In Experiment 1, the authors found priming effects within L1 Dutch. In Experiments 2 and 4 they found priming within L2 English. In Experiments 3 and 4 no priming effects were found between L1 Dutch and L2 English. In Experiment 5 they found priming effects from L1 Dutch to L2 German. Overall, the authors found that priming effects were stronger within languages than between languages, regardless of the languages being tested. Concerning the

occurrence of priming effects from Dutch to German but not from Dutch to English, this was explained by the fact that Dutch and German share the same word order for RCs (verb-final relative clause), whereas Dutch and English differ in that respect. The authors conclude that "word-order repetition is needed for the construction of integrated syntactic representations" (Bernolet et al., 2007, p. 931).

Bernolet et al.'s (2007) findings (stronger priming effects within languages than between languages) were challenged in a recent study by Hartsuiker et al. (2016).[50] Hartsuiker and colleagues conducted four cross-language syntactic priming experiments with multilingual speakers of Dutch as the first language and French, English, and German as second languages. In order to test existing predictions within the shared-syntax account and within the separate, interacting syntax account advanced by De Bot (1992), the authors carried out a production study aiming at investigating "the strength of between- vs. within-language structural priming, on the one hand, and the strength of between-language priming involving an L1 and L2 vs. involving different L2s, on the other hand" (Hartsuiker et al., 2016, p. 16). The syntactic structures tested were relative clause attachments (Experiments 1, 2, and 3) and dative constructions (Experiment 4).

Concerning Experiment 4, which tested "datives with English targets", the researchers investigated priming from L1 Dutch, L2 English, and L2 German (the weakest L2) into L2 English using the dative alternation: DO and PO. The researchers used an adaptation of Hartsuiker et al.'s (2008) dialogue game[51] to create a simulated computer chatting environment in which a *naïve participant* unknowingly interacts with a computer program in

[50] Hartuiker et al.'s (2016) study was the first to find syntactic priming effects in language production between two different second languages. However, the structures of greater interest for the for the purposes of this dissertation (the datives) were tested in a different experimental design: *the dialogue game*.

[51] The *dialogue game* was an adaptation of Branigan, Pickering, and Cleland's (2000) "scripted interaction task" or "confederate scripting". The *dialogue game* is described in the next section dealing with Implicit learning *versus* residual activation accounts.

describing each other's pictures. The *naïve participant* is told that he/she will be interacting with someone in another room through a computer chatting system. The computer's descriptions were used as primes for the participants' responses. The researchers borrowed the dative verbs from Loebell & Bock's (2003) and the pictures from Schoobaert et al. (2007) showing an agent, theme, and recipient. An English dative verb was printed under each picture to elicit dative constructions. Hartsuiker et al. found that within-language priming was similar to between-language priming, and priming from L1 to L2 (Dutch to English) was identical to priming between two L2s (German to English). In fact, all four experiments indicated that syntactic priming was equally strong within and between languages (from L1 to L1, from L2 to L2 and from L2 to L1).

The results are consistent with Schoonbaert et al.'s (2007) findings mentioned earlier, but unlike Schoobaert et al.'s priming effects which might have been boosted by lexical repetition, Hartsuiker et al.'s priming effects were more related with word order overlap as the authors observe that "representations at the syntactic level can be shared across languages despite differences in morphology or pragmatics, but that such sharing requires word order to be identical" (Hartuiker et al., 2016, p. 27). The combined results of the four experiments were interpreted as gathering evidence in support of the shared-syntax account and against the *separate, interacting syntax account* proposed by De Bot (1992):

> All in all, the current results are in line with a shared-syntax account, but they are hard to reconcile with a separate, interacting syntax account like De Bot (1992) according to which newly learned languages strongly overlap with the first language at first, but become more separated as the learner becomes more proficient. (Hartsuiker et al. 2016, p. 28)

The shared-syntax account has also been corroborated by various functional magnetic resonance imaging (fMRI) studies that investigated the activation of specific brain areas in between-language priming conditions (e.g. Golestani et al., 2006; Hernandez et al., 2010; Indefrey et al., 2001; Luke et al., 2002; Weber & Indefrey, 2009). In a comprehensive review, Abutalebi (2008) claims to have gathered sufficient evidence to conclude that, contrary to Ullman's DP model predictions, the L2 grammar is mediated by the same neural structures involved in the acquisition of the native language. This finding was observed for both high and low proficiency bilinguals, suggesting that the acquisition of L2 grammar is not constrained by a critical period. The fact that late L2 learners showed extended activity of neural structures underlying L1 processing was interpreted as a stronger reliance by these learners on L1 processing mechanisms to mediate L2 grammar acquisition due to their low L2 proficiency. This finding is substantiated in more recent brain imaging studies of priming effects which showed that the same neural structures are engaged within production, within comprehension, and between comprehension and production (Menenti et al. 2011; Segaert et al., 2012; Segaert, Kempen, Petersson, & Hagoort, 2013).

By the same token, Golestani et al.'s (2006) fMRI study with 12 late French-English bilinguals (late L2 English acquisition and low L2 English proficiency) reported a correlation between increased proficiency in L2 with increased involvement of the basal ganglia,[52] again contradicting the DP model predictions which denies the involvement of the basal ganglia in the syntactic processing of the L2. That said, it is assumed that increased L2 proficiency

[52] The basal ganglia are subcortical structures (nuclei) made up of the caudate nucleus, the putamen, and the globus pallidus. The primary function of the basal ganglia is to control and regulate activities of the motor and premotor cortical areas, allowing voluntary movements to be performed smoothly (including the articulation of speech). The head of the caudate nucleus (HCN) is concerned with multimodal information processing and inhibition. In highly proficient early bilinguals the left HCN is recruited, along with the left anterior cingulate cortex (ACC), to inhibit the language that is not in use. Hence, both of these structures are involved in keeping the two languages separated during language processing, at least in contexts in which both languages are engaged (Joseph, 2018).

correlates with increased involvement of the basal ganglia, considering the need to resolve conflict and competition between the two languages in use. Likewise, since greater proficiency leads to greater automaticity, again the basal ganglia can be recruited as an inhibitory system, so that the target language is used in a fluid manner. An important question, however, might be whether late L2 learners can attain a level of proficiency and automaticity such that the subcortical structures are activated for L2 processing. Abutalebi (2008) argues that the L1 neural activity will disappear once "a more 'native-like' proficiency is established, reflecting a change in language processing mechanisms: from controlled processing for a weak L2 system (i.e., a less proficient L2) to more automatic processing" (p. 466).

### 3.4.2 Cross-linguistic syntactic priming in comprehension

Unfortunately, cross-linguistic syntactic priming research tackling the *separate-syntax/shared-syntax* dichotomy in the comprehension modality has been extremely scarce. As said before, the great majority of syntactic priming studies have been conducted in the production modality. Weber and Indefrey (2008, 2009)[53] were the first authors to carry out syntactic priming studies in the comprehension modality. After failing to obtain crosslinguistic syntactic priming effects in a previous study, Weber and Indefrey (2009)[54] modified the design of the initial behavioral and fMRI methods to conduct a reading

[53] The authors conducted two behavioral and fMRI during reading studies to investigate syntactic priming of passives between German-English bilinguals in both directions as well as within language. In the first study (2008) they found no cross-linguistic syntactic priming effects from German to English and an inverse priming effect from English to German (German targets were read slower after the English primes). Concerning within language conditions, the authors reported having found "syntactic priming effects within the second language [English] and a weak tendency within the first language [German]" (Weber & Indefrey, 2008, p. 9). As for the fMRI study, the authors reported a "null result of priming" (p. 13), i.e., no priming effects were found whatsowever. The second study (2009) is described in the text.

[54] Although this study did not use dative constructions, it is of particular interest for the purposes of the present dissertation because it is one of the rare studies that have successfully used a behavioral method to test syntactic priming in comprehension across languages. The self-paced reading task developed in the present dissertation was modeled, to a certain extent, on this study.

comprehension experiment among German-English late-acquisition bilinguals using passive sentence constructions. The behavioral experiment – which is of extreme value for the purposes of the present dissertation – tested the hypothesis that primed sentences facilitate the subsequent sentence processing resulting in reduced reading times.

The authors employed a self-paced reading paradigm to test 16 German-English late-acquisition bilinguals who had started learning English as their first foreign language at school at the average age of 10.63 years. Their English proficiency level was tested via the Oxford Placement Test yielding medium results (average of 10.63 mistakes out of 50; SD=4.41). The self-paced reading task was run through Presentation software selected by the researchers for this specific psycholinguistic experiment. The task consisted in the presentation of sentences on a computer screen on a word-by-word fashion. The experimental design included the two conditions: Language combination (English-English, German-English) and Priming (active-passive, passive-passive). The English-English condition had the same verb between prime and target, whereas the German-English condition had a translation equivalent. Reading time measures prompted by the participant's button presses were recorded by the software.

Weber and Indefrey analyzed the reading times for sentences from the third word onwards, since this was considered the region of interest (ROI) "where the syntactic sentence structure became apparent" (p. 1167). They found that, for the primed sentences, words were read faster at the ROI in both conditions, leading to the conclusion that syntactic priming effects were independent of the language of the prime sentence and hence, as "clear evidence for shared syntactic systems between German (L1) and English (L2) on both the cognitive as well as the neural level" (Weber & Indefrey, 2009, p. 1170). The results were then contrasted with Loebell and Bock's (2003) production study, which was not able to find syntactic

priming effects between the same languages tested. As a possible explanation for this failure, Weber and Indefrey (2009) suggest that word order disparity between German and English might have a greater impact on production than in comprehension. According to the authors, this is because in comprehension the target structure to be processed is fixed, whereas in production the participants are expected to select between two structures to be produced. Another possible explanation might be that *the structure itself*, which is under study, may determine whether priming effects in comprehension are detected or not. For example, Hsieh (2016) states that "while priming results of some structures (e.g., reduced relatives) suggest that comprehension priming might be determined by lexical repetition, results for other kinds of sentences (e.g., those containing dative or prepositional structures) are mixed" (p. 6).

Finally, the behavioral findings were reinforced by those of fMRI experiment which concluded that "essentially the same areas are used in the processing of the first and second languages" (Weber & Indefrey, 2009, p. 1170). This is in accord with the theories and models predicting shared neural substrates for syntactic processing in the bilingual brain (Abutalebi, 2008; Golestani et al., 2006; Hartsuiker et al., 2008; Hartsuiker et al., 2016; Indefrey et al., 2001; Luke et al., 2002) and in disagreement with those that predict separate syntax such as Ullman's (2001) DP model or De Bot's (1992) separate, interacting syntax account.

In a recent cross-language syntactic priming in comprehension study, Kidd et al. (2015) used a sentence-picture matching comprehension paradigm (Branigan, Pickering, & McLean, 2005) to investigate the occurrence of abstract crosslinguistic comprehension priming (lexically independent) among L1 English - L2 German bilinguals. According to the authors, no previous study had so far been able to demonstrate abstract crosslinguistic comprehension priming with bilinguals in the absence of lexico-semantic overlap. In order to carry out this study, the authors considered the fact that English allows two different

structures for the relative clauses (RCs): the subject RC with the default Noun-Verb-Noun (NVN) word order (e.g. *the woman that kisses the man*) and the object RC with the marked Noun-Noun-Verb (NNV) word order (e.g. *the woman that the man kisses*). German, on the other hand, only allows the NNV word order for RCs due to the fact that subordinate clauses are always verb-final (e.g. *die Frau, die das Mädchen küsst*, "the woman that the girl kisses"). In this sense, English and German share the same word order for the object RCs, being that in English the object RC is the least preferred structure.

However, in German the nouns and relative pronouns have case and gender-marking. If the nouns are feminine or neutral, the same form of the pronoun can be used in the nominative and in the accusative case, creating an ambiguous RC structure. Hence, the sentence *die Frau, die das Mädchen küsst* can be interpreted as either a subject RC or as an object RC. Importantly, Kidd et al. (2015) report that previous studies (Nitschke, Serratrice, & Kidd, 2010, 2014, as cited in Kidd et al., 2015) had found that native speakers of German are biased towards subject RC, whereas English-German bilinguals are split between subject and object RCs as a result of transfer from the English object RC that is facilitated by word order overlap.

Regarding the experiment, it counted with twenty-seven participants with L1 English and at an advanced German proficiency level. The materials consisted of 56 pairs of pictures displaying feminine or neutral gender characters to ensure ambiguity between subject and object RC readings. An English prime sentence was presented on the computer screen which participants had to read and, once they had understood, they pressed a key to generate two pictures. Then they had to select the picture that corresponded to the meaning of the prime sentence by pressing one of two keys. After that, the German target sentence appeared in the form of a question containing an ambiguous RC (e.g. e.g.,*Wo ist die Malerin, die die Hexe*

*schlägt?*, "Where is the painter that the witch hit?"), and similarly to the prime trial, participants had to read the sentence and then choose the picture that best translated the sentence they had read. The placement of the pictures was counterbalanced in the course of the experiments.

The authors emphasize that since there was absolutely no lexical repetition between prime and target sentences in the entire experiment, any priming effects found would have to be attributed to word order overlap, suggesting the existence of "abstract syntactic representations shared between languages" (Kidd et al., 2015, p. 1064). In fact, *did* find significant priming effects from English object RCs to German object RCs against the baseline, whereas English subject RCs did not prime German subject RCs.[55] The results were interpreted as sound evidence of word order impact on syntactic processing and that "bilingual speakers make use of abstract integrated syntactic representations during sentence comprehension" (Kidd et al., 2015, p. 1066). By dismissing lexical repetition, Kidd et al.'s study expands on Weber and Indefrey's (2009) who had resorted to the lexical boost (same verb in within-language condition; translation equivalent in between-language condition) between primes and targets in their behavioral self-paced reading syntactic comprehension experiment.

Contra Kidd et al. (2015), Hsieh (2016) reported findings from a crosslinguistic syntactic priming in comprehension study with Chinese-English bilinguals which showed that Chinese passive RCs primed English targets (ambiguous between active main clause and the

[55] The finding that English subject RCs did not prime German subject RCs is consistent with Bernolet et al. (2007) reported earlier, in the sense that they also failed to find priming effects between Dutch and English RCs, which have different word order. Word order might also have been a factor in Loebell & Bock (2003) who were not able to find priming effects between English and German passives.

marked passive reduced relative structure) independently of word order overlap[56]. The experiment consisted in a self-paced reading task which counted with 54 young adult (aged 19 to 22) native speakers of Mandarin Chinese at intermediate English proficiency level (B1/B2) of the CEFR. Regarding the experimental design, a total of twenty trials was created. The critical items contained four sentences: two Chinese passive relative primes followed by a Chinese/English filler and, finally, the ambiguous English active main clause / passive reduced relative target. The author highlights that the use of a duplicate prime was based on the literature (see Pickering & Branigan, 1998; Thothathiri & Snedeker, 2008, as cited in Hsieh, 2016) according to which "priming effects might be reinforced with a structure occurring across multiple verbs"[57] (Hsieh, 2016, p. 11). The experiment tested three conditions: 1) prime with verb repetition (the same verb was used in the primes and a translation equivalent was used in the target); 2) prime without verb repetition (different verbs between the primes and the target); 3) No-prime condition.

The author found that, in the prime conditions (1 and 2), the English targets were read faster at the disambiguating *by*-phrase than in the *no prime* condition. Hence, cross-linguistic syntactic priming effects were found in structures that have different word order, a result that contradicts the findings reported in previous crosslinguistic syntactic priming studies in production, such as Loebell and Bock (2003) and Bernolet et al., (2007), and the comprehension study by Kidd et al. (2015) previously reported. In fact, Hartsuiker et al. (2016) had even affirmed that "there seems to be no cross-linguistic syntactic priming for

[56] Chinese and English have different word order in passive RC structures but the functional relations between constituents (grammatical mapping and thematic roles) is the same.

[57] In the present dissertation, a double prime was also utilized in the design of the self-paced reading (syntactic priming in comprehension) task, based on the same prediction from the literature. However, it was not possible to have No-prime condition because the alternative structure was not available in the source languages. Hence, this fact was a limitation in the experiment. The priming effect was measured by comparing reading times in prime and target, particularly in the critical region or the region of interest (ROI).

studies priming constructions differing in word order" (Hartsuiker et al., 2016, p. 27). Yet, aside from the disagreement regarding word order, Hsieh's (2016) findings are consistent with these and other previous syntactic priming studies in comprehension and production, in the sense that "the findings support an account under which bilingual sentence processing involves abstract (…) syntactic representations that are integrated between languages" (Hsieh, 2016, p. 657).

As a note of observation, Hsieh (2016) highlights that "this is the first study demonstrating comprehension priming between genetically and typologically unrelated languages" (p. 15). The three cross-linguistic syntactic priming studies in comprehension that had been conducted before (Weber & Indefrey, 2008, 2009, and Kidd et al. 2015) had used German and English, two Germanic languages. Thist tendency was also true for previous production studies, which focused on L1 and L2 languages such as Dutch, English, and German (e.g. Bernolet et al., 2007; Desmet & Declercq, 2006; Gries & Wulff, 2005; Loebell & Bock, 2003; Melinger & Dobel, 2005; Salamoura & Williams, 2003, Schoobaert et al., 2007).[58] However, like Hsieh (2016) demonstrated in comprehension, previous production studies had shown that syntactic priming effects hold beyond language typology. For example, syntactic priming effects have been found in very distant language combinations such as Korean-English (e.g. Kim & McDonough, 2008; Shin & Christianson, 2009) and Thai-English (McDonough & Mackey, 2008). More recently, syntactic priming has been found between a Romance language (French) and two Germanic languages (Dutch and English) in both directions (e.g. Hartsuiker et al. 2016). These findings suggest that shared syntactic representations are not constrained by linguistic typology.

[58] This fact seems to suggest that linguistic typology has been regarded as a facilitator of transfer, thus supporting Rothman et al.'s (2015) Typological Primacy Model (TPM) discussed in the previous chapter.

More recently, Felício (2018) investigated the cross-linguistic syntactic priming effects among 30 L1 Brazilian Portuguese (L1BP) speakers of L2 English. The study tested the comprehension of sentences, targeting the passive voice in a self-paced word by word reading paradigm. The experimental design comprised four conditions: 1) passive prime-target structures with translation equivalents in target sentences; condition 2) passive prime-target structures with different translations in target sentences; condition 3) active prime sentences with translation equivalents in target sentences; condition 4) active prime sentences with different translations in target sentences. Syntactic priming effects were observed only for condition 1, in which prime and target sentences shared both structure and lexicon (translation equivalent). As predicted in Weber & Indefrey (2009), the reduction of processing time at the critical region of the L1BP sentences primed a faster processing of the same region in the target L2 English sentences. The results were interpreted as providing further evidence for shared syntactic representations across languages.

Nevertheless, the priming effects found in condition 1 were argued to have been lexically driven, even though the author admitted that "shared translation and shared structures together were pertinent to provoke syntactic priming between languages" (p. 60) due to the fact that lexical repetition alone was not sufficient to trigger syntactic priming effects in condition 3, which had a different word order between prime and target sentences (active primes and passive targets). Hence, it was not clear whether the priming effects found in condition 1 were primarily triggered by lexical repetition or word order overlap.

This issue of whether syntactic priming (both within and between languages) is lexically driven or whether it is determined by structural similarities has been at the center of the debate between lexicalist and structural accounts of syntactic priming. The following section will attempt to shed light on this issue with studies investigating both within- and

between-language syntactic priming. Again, whenever for the purposes of the present dissertaton, whenever convenient, the focus will be placed on the between-language syntactic priming studies.

## 3.5 IMPLICIT LEARNING *VERSUS* RESIDUAL ACTIVATION

The literature offers a rather fervent debate surrounding the mechanisms that are responsible for the facilitation effects that have been observed in different studies dealing with within and across-language syntactic priming. The debate set off with two opposing theoretical accounts that attempted to explain the sources of syntactic priming: the residual activation account (Pickering & Branigan, 1998) and the implicit learning account (Bock & Griffin, 2000).

Advanced by Pickering and Branigan (1998), the residual activation account proposes that syntactic priming is driven by syntactic information embedded in the lexicon. Hence, it assumes a lexicalist standpoint by assigning the lexical item (the verb, in this case) shared by the prime and the target a critical role in governing the syntactic structure that is activated after the presentation of the sentence stimuli. According to Pickering and Branigan (1998), syntactic priming is mediated by "lexical entries [which] include a *lemma stratum* [authors' italics], encoding syntactic information" (p. 633). The authors go on to propose a model of the lemma stratum for the verb. They identified three types of information, which they termed "nodes" that must be represented by the verb: 1) a node related to category (e.g. word-class); 2) a node associated with feature (e.g. tense, number, aspect, etc.); and 3) a combinatorial node that allows the verb to select specific structures that it can go with. For example, some dative verbs are more commonly followed by *NP, NP* while others prefer *NP, PP* (Malchukov et al., 2007; Rappaport Hovav & Levin, 2008). The verb *give* can occur either with the double-object construction (DO) or with the prepositional object (PO) construction. If primed

with the DO construction (*John gave the cat a fish*), the speaker is more likely to activate the *NP, NP* node, whereas if primed in the PO construction (*John gave a fish to the cat*) the *NP, PP* node is activated in subsequent productions. However, the authors emphatically state that "combinatorial information is represented as a property of a verb lemma, not as a property of a particular instantiation of a verb" (Pickering & Branigan, 1998, p. 635). This is because the verb lemma *give* is activated prior to the word *gave*, which carries the nodes for category (verb), feature (past simple), and combinatorial node (*NP*,*NP* or *NP*,*PP*).

Similarly, if the prime and target sentences contain different verb lemmas but share the same properties in terms of combinatorial nodes (e.g. NP, PP), the model predicts that syntactic priming will occur as a result of the combinatorial nodes being the same. For instance, the lemmas *give* and *send* are likely to prime each other because they share the same combinatorial node, even though the features (tense, number, aspect, etc.) are not specified. However, Pickering & Branigan (1998) highlight that when a word is produced, all of the nodes associated with it activated at the lemma level. Hence, "when the speaker produces *The man gives the dog a bone,* the word *gives* involves activation of the lemma *give,* the feature nodes for third person, singular, present tense, and so on, and the combinatorial node *NP, NP"* (p. 636). That said, prime between sentences with two different verbs is predicted to be weaker than prime between sentences which share the same verb because the former scenario will only allow for the residual activation of combinatorial nodes, whereas the latter scenario elicits the residual activation of all three types of nodes at the lemma stratum, thus, resulting in a lexical boost effect. As a result, "these nodes and links remain active for several seconds, which leads to the repeated use of this same construction over multiple sentences" (Jackson & Ruf, 2016, p. 3).

To test their predictions, Pickering & Branigan (1998) conducted five experiments with native English speakers by way of a written completion syntactic priming task. In each experiment, the researchers provided the participants with two pairs of sentence fragment primes that contained a subject noun phrase, a dative verb and a postverbal noun phrase that could be either a potential theme or a potential beneficiary (e.g. *The racing driver showed the torn overall…*/ *The racing driver gave the helpful mechanic…*) and a sentence fragment target containing just a subject noun phrase and a dative verb that could be followed by a DO or a PO. In Experiment 1 the prime fragment pairs contained different verbs but in the same tense (*gave, showed*) and the target fragment contained the same verb and tense that were used in one of the prime fragment pairs. In Experiment 2, the prime fragment pairs contained two different verbs in the same tense (*offered, mailed*); the same verb tense was repeated in the target fragment, but with a different verb (showed). The researchers found that syntactic priming occurred regardless of verb repetition between prime and target sentences. However, they also found that when the verb was repeated, the priming effect was enhanced.

In Experiment 3, they used the same verb across prime and target fragments (*show*), but the tense was manipulated so that the first prime fragment pair had the past simple (*showed*) and the second pair had the present simple (*shows*); the target fragment repeated the tense from the first prime fragment pair (*showed*). In Experiment 4, the researchers repeated the procedure from Experiment 3 using the same verb across prime fragment pairs and target fragment, except the second prime fragment pair used the past continuous tense (*was showing*). Finally, in Experiment 5, the researchers used the same verb (*show*) and the same tense (present simple) across prime fragment pairs and target fragment. They only manipulated the verb conjugation so that the first prime fragment pair used the third person singular (*shows*) and the second prime fragment pair used the third person plural (*show*); the

target fragment repeated the verb conjugation from the first prime fragment (*shows*). The researchers found that the manipulation of verb tense, aspect, and number between primes and targets did not affect syntactic priming, i.e., syntactic priming occurred independently of whether those aspects stayed the same or not. These results were interpreted as "evidence about the representation of syntactic information within the lemma stratum" (Pickering & Branigan, 1998, p. 633).

Pickering and Branigan's (1998) model was supported by a cross-language syntactic priming study developed by Hartsuiker et al. (2004). With the *shared-separate syntax* dichotomy as the background research question, the authors adapted Branigan, Pickering, and Cleland's (2000) scripted interaction task (also known as *confederate scripting*) into a *dialogue game* to investigate whether syntactic priming occurred during conversation among L1 Spanish - L2 English bilinguals. The game consisted in having a *confederate* and *a naïve participant* interact with each other using cards with prime sentences (for the confederate) and target pictures (for the naïve participant). The target pictures had a verb at the bottom and were created with the aim of eliciting passive structures. The experiment was organized so that the prime sentences in the confederate's cards were immediately followed by the picture descripions in the naïve participant's cards. The confederate read his cards aloud in Spanish[59] for the naïve participant, who would then describe his/her picture in English.

Hartsuiker and colleagues (2004) found that Spanish-English bilinguals produced more English passive sentences after a Spanish passive sentence than after a Spanish active sentence. Based on these results, the researchers proposed that Pickering and Branigan's (1998) model of the residual activation account "can be extended to bilingual lexical-syntactic

[59] The confederate pretended to describe pictures to the naïve participant because the "goal" of the experiment was to investigate bilingual communication based on picture description. The confederate and the naïve participant's desks were divided by a screen to keep them from seeing each other's cards.

representations, so that lemmas for English and Spanish verbs are connected to the same category node and to the same combinatorial nodes" (Hartsuiker et al., 2004, p. 412). That is to say that translation equivalents and their nodes (lemmas, categories, combinatorial nodes) are represented at the conceptual level in the bilingual brain, so that *golpear* and *hit* share one semantic node, *perseguir* and *chase* share another semantic node, and so on and so forth. At the end of the day, "if a bilingual speaking English activates the English verb lemma *hit* via the conceptual node 'HIT (X, Y),' the Spanish verb lemma *golpear* is also activated" (Hartsuiker et al., 2004, p. 413). In the authors' perspective, this model would explain the facility with which bilinguals can switch between their two languages in a conversation, as well as the inclination that even proficient bilinguals have for borrowing structures from their L1 when using their L2.

The residual activation account has been supported by a number of other syntactic priming studies that investigated the interaction between lexical items and related syntactic structures, i.e., the effect of the lexical boost between prime and target sentences within and across languages (see Cleland & Pickering, 2003; Melinger & Dobel, 2005; Salamoura & Williams, 2006, 2007; Segaert et al., 2013; Segaert, Cladder-Micus, Weber, & Hagoort, 2014, Traxler & Tooley, 2007, 2008; Traxler, Tooley, & Pickering, 2014). For example, Melinger and Dobel (2005) found, through within-language picture description tasks, that a single prime verb could prompt a particular syntactic structure. German and Dutch native speakers tested in Experiment 1 and Experiment 2, respectively, reused the primed dative structure more frequently after being primed with non-alternating dative verbs that allowed either the PO or the DO construction. Salamoura and Williams (2006) replicated Melinger and Dobel's experiments, but cross-linguistically, in a sentence completion task with Dutch-English bilinguals who were primed with non-alternating Dutch verbs that could take either

the PO or the DO. Finally, in another picture description task with Dutch primes and English targets, Kootstra and Doedens (2016) found that "the priming effect changed as a function of Dutch (non-target-language) verb bias, to the extent that the priming effect even appeared to flip in target verbs with a relatively high DO bias" (p. 723).

Nevertheless, an inherent characteristic of the residual activation account, as observed in Pickering and Branigan's (1998) model, is that the activation of the combinatorial nodes and the links that sustain them are short-lived, i.e., they are sustained by "temporary activation of information in [short-term] memory" (Bock & Griffin, 2000, p. 178), and undergo a gradual decay (hence, the name "residual activation"), albeit its proponent has argued that the activation "does not disappear immediately" (Pickering & Branigan, 1998, p. 636) as the speaker can take advantage of the residual information to produce subsequent sentences that have the same structure.

In fact, as mentioned elsewhere, early in the study of syntactic priming, the idea was that it was due to "effects of activation processes [that interfered] in language production" (Bock, 1986), causing speech errors or slips of the tongue. But, over the years, the literature has demonstrated that activation processes *per se* cannot account for the persistent effects that have been found in other syntactic priming studies such as Bock & Griffin's (2000) who reported effects spanning across 10 intervening sentences, or Kaschak, Kutta and Schatschneider (2011) who found cumulative priming effects that persisted over the course of a week. More strikingly, syntactic priming effects have been found in picture description tasks with people with severe impairments in explicit memory (patients with anterograde amnesia[60]) even when there were as many as ten filler sentences between prime target pictures (Ferreira, Bock, Wilson, & Cohen, 2008). Such effects have been explained within the

[60] "Individuals with anterograde amnesia have severe deficits in their ability to encode new information and thus are very poor at recalling recent events" (Leonard, 2011, p. 4).

framework of the implicit learning account under the assertion that syntactic priming is a reflection of the procedural learning of abstract syntactic rules from recurring sentence structures (Bock, Dell, Chang, & Onishi, 2007; Chang, Dell, & Bock, 2006; Chang, Dell, Bock, & Griffin, 2000; Jaeger & Snider, 2007; Kaschak et al., 2011). According to the model's proponents, it is due to this implicit learning that the reuse of those same structures occurs in future utterances.

Syntactic priming effects persist even in the presence of intervening materials between prime and target. This finding was first brought to light by Bock and Griffin (2000) who conducted two experiments to test the residual activation account against the implicit learning theory. In the first experiment, the authors had a group of 76 participants performing a picture elicitation task with transitives (actives and passives) and dative structures (DO and PO). After listening to and repeating the prime structures, participants were asked to type their descriptions of the target pictures which were displayed on a computer monitor. There were zero to two filler sentences (intransitives or predicative-adjective structures) between each prime sentence and target picture.

In the second experiment the sample size was increased to 179 participants and the material from the experiment was maintained, though with adjustments to conform to the increase of the sample size. The procedure was the same as in the first experiment but this time the number of fillers was increased to as many as 10 between each prime sentence and target picture. The authors found consistent priming effects that had a similar magnitude in both experiments, i.e., whether there were two or ten intervening materials did not interfere in the magnitude of syntactic priming.[61] This finding led them to conclude that "although

[61] It is noteworthy though that in both experiments the dative structures yielded stronger priming effects than the transitives. Bock and Griffin (2000) reported that "priming for datives was evident at all lags, whereas priming for transitives in some cases approached zero" (p. 188).

memory may have short-term consequences for some components of this kind of priming, the persisting effects are more compatible with a learning account than a transient memory account" (Bock & Griffin, 2000, p. 177).

To date, the most influential model of the implicit learning account is the error-based implicit learning model developed by Chang, Dell, Bock, and Griffin (2000) and then refined by Chang, Dell, and Bock (2006). The model was designed to explain long-lasting syntactic priming effects that are independent of the lexicon. The authors assumed a connectionist perspective[62] to the learning of syntactic structures based on the premise that the creation of syntactic structures within the human production system reflects adjustments to external input. In other words, the production system engages in a trial-and-error interaction with the environment, and then adapts itself in future interactions to efficiently prevent innacurate inputs and select alternative ones. Based on this human skill, the authors proposed a computational model of syntactic priming as a way to explain implicit learning, in direct opposition to the residual activation account.

Chang et al. (2000) set off by recalling previous works that had demonstrated that syntactic priming was syntactic in nature. The authors propose the example of Bock and Loebell (1990, Experiments 1 and 2) with the following finding:

> Prepositional locatives (e.g., "The wealthy woman drove the Mercedes to the church") are as effective as prepositional datives ('The wealthy woman gave the Mercedes to the church') at priming prepositional datives […], and intransitive locatives (e.g., "The 747 was landing by the control tower") are as effective as passives ("The 747 was alerted by the control tower") at priming passives. (Chang et al., 2000, p. 218)

[62] Also known as parallel distributed processing (PDP), connectionism endorses the view that human cognition consists of a large array of interconnected processing units (neurons) which work simultaneously in a network fashion (hence, the term 'parallel') (Ping & Xiaowei, 2012).

Moreover, Bock and Loebell (1990, Experiment 3) also found that syntactic priming occurred only when the same structure was maintained between prime and target. Put that, Chang et al. (2000) conclude that syntactic priming is governed by a "surface syntactic configuragion" (p. 219) which is processed at the unconscious level during the performance of a task by an individual. This processing is, in accord with Seger (1994), incidental, and entails the assimilation of complex and abstract syntactic connections that lead to implicit learning.

Chang et al. (2006) state that the computational model they proposed imitates the human neural system's behavior in the implicit learning of abstract syntax. This is understood as the ability to incorporate previous inputs (e.g. words) to generate predictions about subsequent inputs in a sequence of sentence patterns during a production task. If the predictions are incorrect, then the system adjusts itself and makes the necessary connections between the inputs received, hence, achieving learning. The authors took hold of a simple recurrent network (SRN) system (Elman, 1990) – whose learning algorithm was insufficient to allow it to use a symbolic language like humans do[63] – and, in order to adapt it to a sentence production syntactic priming, they equipped it with the dual-pathway architecture[64] (Chang, 2002; Chang et al., 2006).

[63] For example, the SRN could learn word sequences based on equivalence relations like *A rose is a rose* and make the correct prediction that the word *tulip* follows the fragment *A tulip is a…* But when presented with a novel sentence containing made up words like *A blicket is a…* the SRN was unable to predict that the next word would be *blicket*. Instead it would activate the words that had been used in that position such as *rose* or *tulip.* Such use of symbolic language is a normal part of everyday communication among humans (Chang, 2002).

[64] The dual-path model was developed by Chang (2002) as a response to critiques of connectionist models of language on the inability of these models (such as the SRN) to use symbolic language like humans do. The model was designed for sentence production and its architecture has one pathway for mapping message meaning to words and another pathway for sequencing words into syntactically accurate structures. In this way, it fills the existing gap of the SRN, granting it the ability to use a symbolic language that matches human language. According to Chang (2002) "analysis of the model's hidden units demonstrated that the model learned different types of information in each pathway, and that the model's compositional behavior arose from the combination of these two pathways" (p. 609).

Chang et al. (2006) trained the SRN to recognize a message and decompose it into a sequence of words, one at a time, echoing the sequence of sentences used in syntactic priming tasks. Three unit layers from the dual-pathway architecture allowed the model to map words into meaning and to sequence words to form syntactically correct sentences: the *input* unit, which receives the comprehended word and transmits to the *hidden* unit which represents the present state of the network; the *hidden* unit "copies" the *input* information and forwards it to the context, which represents a sort of database of the network, simulating a human mental lexicon; the context records the information and sends it back to the *hidden* unit as confirmed *input*, which is then released in the form of *output* unit. The whole process happens at an implicit level and, thus, is purely syntactic, since the model cannot recognize word meanings.

From the syntactic priming experiment conducted, Chang and colleagues (2006) noted that, contrary to Pickering and Branigan's (1998) claims that syntactic priming is triggered at the lemma level and a link to combinatorial nodes (e.g. *NP,NP; NP,PP*), the error-based implicit learning model "does not exhibit increased structural priming when there is lexical or morphological overlap" (Chang et al., 2006, p. 256). Chang et al. (2006) admit to the existence of the lexical boost effect for syntactic priming[65], but attribute it to the workings of the short-term memory, which decays rapidly and, hence, is not powerful enough to explain the long-lasting syntactic priming effects found in the experiment. Moreover, because the residual activation account is lexically bound, it is at odds with the model's mechanisms which allow it to generalize sentences "in a humanlike manner" (p. 237). The following passage illustrates this assertion:

> The sequencing system has only limited contact with the meaning system. Specifically, it does not connect directly to the concepts bound to the roles, but only to

[65] However, Chang et al. (2006) point out that "lexical enhancement occurs for verbs and nouns, but not function morphemes, because the latter are not particularly effective retrieval cues" (p. 256).

> the roles. Therefore, when it learns to sequence, say, "*dog*" in "The dog carries the flower," the sequencing system really only learns how to order the role that is linked to the dog concept. It does not sequence "*dog*" directly. Later, when the model is asked to produce "The cat carries the rose," the cat concept is linked via fast-changing weights to the same role. Consequently, what the mode learns about how to sequence this role transfers fully to cat. (Chang et al., 2006, p. 237)

Chang et al.'s (2006) error-based implicit learning model helps to explain the findings in Ferreira et al.'s (2008), in which patients with anterograde amnesia, and hence cannot rely on explicit memory, were able to match their controls counterparts in a picture elicitation task with as many as ten intervening sentences between prime sentences and target pictures. This is because these patients' implicit memory (which corresponds to the sequencing system in Chang et al.'s model) which is responsible for sequencing words into syntactically correct utterances is intact. However, contrary to the controls, these amnesic patients were not as good at recognizing the prime sentences when asked to. This is because sentence recognition taps into the explicit memory (which corresponds to the meaning system in Chang et al.'s model), which is responsible for mapping words into meanings.

Hence, in the error-based implicit learning model, syntactic encoding[66] precedes lexical retrieval. If this truly reflects the way language processing occurs in humans, then syntactic priming does not depend on lexical repetition and the residual activation account cannot explain the underlying mechanisms behind syntactic priming in Ferreira et al.'s (2008) study with patients with anterograde amnesia.

[66] According to Indefrey et al. (2001), "syntactic encoding is highly automatized [and] operates largely outside of conscious awareness" (p. 5933).

To conclude, while "all studies on syntactic priming across languages provide evidence for shared syntactic representations between languages" (De Jesus & Mota, 2017, p. 133), the debate remains over what motivates it. As it became apparent in the studies described in this chapter, two theoretical accounts have been disputing the floor. One states that syntactic priming is triggered by residual activation of linguistic information contained in the lexicon. The other maintains that syntactic priming is a result of the implicit learning of recently processed abstract syntactic representations that persist in time for subsequent reuse. The syntactic priming studies conducted in the present dissertation may help to illuminate the debate. They are reported in Chapters VI and VII in relation to L3 English learners at intermediate levels of proficiency. For the moment, the floor will be given to the discussion concerning learners at initial stages of L3 acquisition, whose processing strategies are still essentially guided by explicit comparisons between the grammars of the sentences at hand in each of their languages. The discussion will be developed in the light of the most important models of L3 morphosyntactic transfer developed in the last decade.

# CHAPTER IV

# L3 MODELS OF MORPHOSYNTACTIC TRANSFER

Although the present dissertation is primarily focused on cross-linguistic influence at the level of syntax from a psycholinguistic perspective, the field has not yet embraced L3 acquisition from a syntactic standpoint. The majority of psycholinguistic studies relating to L3 are concerned with the lexicon (García-Mayo, 2012). Likewise, because L3 acquisition research has largely stemmed from SLA, Leung (2007a), stresses the need for L3 acquisition to be treated as a separate concept from that of the L2 so that "the study of multilingualism offers test cases of less studied natural languages […] to explore" (p. 108)". The present chapter introduces three influential L3 models of morphosyntactic transfer that have been proposed in the last decade: 1) the L2 Status Factor (Hammarberg, 2001; Bardel & Falk, 2007, 2012; Falk & Bardel, 2011); 2) the Cumulative Enhancement Model (CEM) (Flynn et al., 2004; Berkes & Flynn, 2012); and 3) the Typological Primacy Model (TPM) (Rothman et al., 2015). They are all concerned with past puberty learners at initial stages of L3 acquisition and whose L1 and L2 have been consolidated. This chapter provides the theoretical basis for the study developed in the present dissertation focusing on the modality of writing among beginner L3 English proficiency level Cape Verdean-Portuguese bilinguals.

## 4.1 WHY THIRD LANGUAGE ACQUISITION?

Learning a third language is not the same thing as learning a second language. This notion is at the basis of the emergence of the TLA field and, hence, constitutes the backbone of L3 acquisition research (Cenoz, 2001; Cenoz, 2008; Cenoz, Hufeisen, & Jessner, 2001; Herdina & Jessner, 2002). Recent brain imaging findings in bilingual research have suggested that "bilinguals at all ages demonstrate better executive control than monolinguals matched in age and background factors" (Bialystok, Craik, & Luk, 2012, p. 2). Language control is a

crucial feature unique to the bilingual language system (Abutalebi, 2008), a factor that makes bilinguals more skilled learners of additional languages. According to Cenoz (2008) when learning a third language (or additional languages) learners take advantage of the bilingual experience to develop learning strategies and maximize their metalinguistic awareness.

In effect, works by Jessner (2006, 2009) emphasize that the multilingual mind is a dynamic system where multiple pieces of information interact to create "the enhanced metalinguistic awareness found in L3 learners" (García-Mayo, 2012, p. 134). What is more, these learners possess "a larger linguistic repertoire" (Cenoz, 2008, pp. 221-222) which they can make use of to compensate insufficiencies in the target language or to code-switch /code-mix to better get the message across. Therefore, "acquiring a second language changes the cumulative grammatical knowledge in the mind/brain, and so acquisition of an L3 does not proceed from a clean L1 slate" (Slabakova, 2016, p. 4). For these and other reasons, "it is now definitively clear that there are methodological, cognitive, linguistic, and epistemological reasons why L3 acquisition must be considered independently" (Rothman et al., 2015, p. 1).

Over the last decade, three important models have been proposed concerning initial stages of L3/Ln language acquisition: the L2 Status Factor (Hammarberg, 2001; Bardel & Falk, 2007, 2012; Falk & Bardel, 2011), the Cumulative Enhancement Model (CEM) (Flynn et al., 2004; Berkes & Flynn, 2012) and the Typological Primacy Model (TPM) (Rothman et al., 2015). Common among these models is the fact that they are all concerned with the transfer of morphosyntactic information among adult (past puberty) learners at the initial stages of L3 acquisition, after the learning of the L1 and the L2 have been consolidated to a greater or lesser extent. However, the models differ essentially in their understandings of the role of the L1 and of the L2 in L3 acquisition. The following sections will discuss each of these models.

## 4.2 THE L2 STATUS FACTOR

The L2 Status Factor assumes that transfer to the L3 occurs primarily from the L2. Bardel and Falk (2007), the proponents of this model, draw from Hammarberg's (2001) work to suggest that "in L3 acquisition, the L2 acts like a filter, making the L1 inaccessible" (Bardel & Falk, 2007, p. 480). Based on Ullman's DP model[67], Bardel and Falk (2007) invoke a "higher degree of cognitive similarity between the L2 and the L3 than between the L1 and the L3" (p. 459) to sustain their claim that the L2 is more accessible for syntactic transfer than the L1. In other words, a language learned after the L2 is faced by the learner as a similar cognitive undertaking as that of the L2. De Angelis (2007) has termed this phenomenon as "association of foreignness" said that it is explained as "the cognitive association that learners establish between non-native languages, which are assigned the common status of 'foreign languages'" (p. 29). In short, the L2 Status Factor's argument is that, since late L3 learners (past puberty)[68] rely more on the declarative memory "they would default to suppressing the L1 and rely more heavily on the L2" (Rothman et al., 2015, p. 2). This means that, from the perspective of the L2 Status Factor, after puberty age the L3 grammar can only be learned in a conscious manner, at least at the initial stages of learning.

According to Rothman et al. (2015), the L2 Status Factor is best supported by the data in Bardel and Falk (2007) and Falk and Bardel (2015). In these studies the authors used grammaticality judgement tasks to analyze the placement of negation in target (L3) Swedish

[67] As a note of reminder, the DP model posits that the grammar of the L2 (as well as the grammars of all late-acquired languages) is stored and processed in the declarative memory (explicit), whereas that of the L1 is stored and processed in the procedural memory (implicit).

[68] Paradis (2009) suggests an "optimal period" ranging from 2 to 5 years of age. After this period, language learning is subserved by the declarative memory. However, the recent literature on bilingualism is inconsistent regarding a cut-off age for early acquisition. For example, in Jasinska and Petitto (2013) the cut-off is 3 to 5 years old. In Klein, Mok, Chen, and Watkins it is 8 to 13 years old.

and Dutch– which are languages governed by the Verb-second rule[69] (V2) – among two different groups of learners. One group had a V2 L1 and a non-V2 L2 (English) and the other group has a non-V2 L1 and V2 L2 (either Dutch or German). The data showed that the second group that had non-V2 L1 and V2 L2 (either Dutch or German) performed better than the first group that had V2 L1/non-V2 L2 (English) in the production of post-verbal negation. An example of the L2 English group erroneous pre-verbal placement of the negation looked like *Jag inte går till universitetet,* (English: 'I don't walk to the university'), when the correct (post-verbal) placement should be *Jag går inte till universitetet*. The authors conclude that "only a privileged role for the L2 is corroborated by the data" (Rothman et al., 2015, p. 2).

Conversely, previous studies had suggested that "L2 syntactic transfer had no impact on L3 acquisition" (Bouvy 2000; Dentler 2000; Håkansson, Pienemann, & Sayehli, 2002, as cited in Angelovska & Hahn, 2012, p. 26). Dentler (2000) conducted a study of L3 German main clauses produced by L1 Swedish speakers of English as L2. The author found that participants "did not use the 'verb-second position' rule correctly even though the same word order rule also exists in Swedish (which is not the case for English)" (Dentler, 2000, as cited in Angelovska & Hahn, 2012, p. 26). Håkansson et al. (2002, as cited in Angelovska & Hahn, 2012) conducted a similar study and the results were replicated, leading the authors to the same appraisal. Based on these studies, Angelovska and Hahn (2012) conclude that the claim that the L2 is the default or only source for the L3 syntactic transfer needs to be revised. The next model presents a, seemingly, more integrating perspective concerning the roles of the previously learned languages in L3 acquisition.

[69] The placement of negation has to do with the raising of the finite verb to the second place in the main clause (the V2 rule). The V2 rule is a property of all Germanic languages, except English (Bardel & Falk, 2007).

## 4.3 THE CUMULATIVE ENHANCEMENT MODEL

The Cumulative Enhancement Model (CEM) proposed by Flynn et (2004), has a more integrating view than the L2 Status Factor concerning the roles of the L1 and of the L2 in the acquisition of an L3/Ln. The CEM describes language acquisition as "a collective process throughout the lifespan whereby experience with the acquisition of any prior language can facilitate subsequent language acquisition" (Rothman et al., 2015, p. 3). In other words, in a multilingual context, transfer can occur from any linguistic knowledge that has been previously acquired, regardless of the order in which each language was acquired. Hence, as the model's name itself suggests, language learning is cumulative, and its proponents maintain that, at the initial stages of L3 acquisition, either the L1 or the L2 can be a source of morphosyntactic transfer into the L3. Nevertheless, Flynn et al. (2004) argue against a non-facilitative transfer, i.e., they believe that transfer is restricted to situations in which the source language structures have a "facilitative" effect on the learning of the target language structures. Otherwise, it is "effectively blocked" (Rothman et al., 2015, p. 3).

The formulation of the CEM was motivated by the results of a study in which the authors (Flynn et al., 2004) were interested in investigating the acquisition of English CP structure. The study was guided by two central questions: 1) does the learning of subsequent languages derive primarily from the learner's L1? ; 2) is language learning cumulative, i.e., does it incorporate the features acquired in any of the previously learned languages? The authors compared several results involving different groups of learners: children acquiring English as L1, adults with L1 Spanish or L1 Japanese learning English as L2, and children and adults with L1 Kazakh and L2 Russian learning English as L3. The languages studied differ in their CP structures. English, Spanish, and Russian are head-initial and right-branching languages whereas Kazakh and Japanese are head-final and left branching

languages. The reported findings conclude that the L1 Kazakh and L2 Russian learners of English as L3 learn the English CP structure more effortlessly than, for example, L1 Japanese learners whose source language does not have a similar CP structure and who, unlike, the L1 Kazakh/L2 Russian/L3 English and L1 Spanish groups, had never had any experience with the CP structure found in English. This result was interpreted as evidence in favor of the theory that any prior linguistic knowledge can have a facilitative effect on L3 learning, regardless of whether it is the L1 or the L2.

Nonetheless, Bardel and Falk (2012), the proponents of the L2 Status Factor, questioned this interpretation arguing that it was complicated by the fact that learners were at the initial stages of L3 acquisition, so their knowledge of the L3 was insufficient to allow them to successfully make comparisons on the basis of similarities in relation to their source languages. Furthermore, the results of the study showed that transfer occurred only from the L2 (and not from the L1) for L3 learners, a fact that supports the L2 Status Factor's view that the L2 is the most probable candidate for transfer into the L3. Bardel and Falk (2012) report a passage in Flynn et al. (2004) in which the authors admit this possibility:

> The adult results we report here are left confounded with respect to the role of an immediately prior learned language. Could it be that the last learned language determines the next language learned in some sense? Such an explanation is compatible with the results reported here as well. Subsequent testing demands that we consider the acquisition of an L3 by a speaker in which the CP properties, for example, match in the L1 and the L3 but not the L2. (Flynn et al. 2004: 13-14, as cited in Bardel & Falk, 2012, p. 64)

The CEM's argument against a non-facilitative transfer, again, the idea that transfer can only occur when the source language structures facilitate the learning of the target

language structures, was also a subject of controversy. Rothman et al. (2015) present two arguments against the non-facilitative view. The first argument is in agreement with Bardel and Falk's (2012) that the learner should have an adequate amount of experience with the L3 "on a property by property basis" in order to decide what is facilitative and what is not in the source languages. This is clearly not the case, since the model is designed for initial stages of L3 acquisition. The second argument is related to the simultaneous activation of L1 and L2 for L3 development. According to Rothman et al. (2015), the two source languages would need to be activated at all times so that the learner could make the distinctions between what is facilitative and what is not. In either case, there would be a strong "cognitive cost that creates a burden on finite resources" (Rothman et al. 2015, p. 3). Therefore, Rothman et al. (2015) advanced an alternative model of L3/Ln transfer which he called the Typological Primacy Model (TPM) which is discussed in the following section.

## 4.4 THE TYPOLOGICAL PRIMACY MODEL

The TPM shares the CEM's views that learning is cumulative in the multilingual context and that, in this sense, either the L1 or the L2 can be transferred to the L3 at the initial stages of acquisition. However, what determines which of the two languages will be transferred, is not just mere facilitation but, ultimately, the perception of typological similarities between the languages involved at a general level (example study below). Hence, the model is grounded on the proposition that CLI is ultimately determined by "factors related to underlying structural similarity between the languages at play, as opposed to mere facilitation" (Rothman, 2015, p. 5).

Unlike the CEM, the TPM admits that non-facilitative transfer can also occur. In fact, Rothman et al. (2015), the proponents of TPM, do not understand the CEM's denial of non-facilitative transfer and state that "clear motivations for why the CEM rejects non-facilitative

transfer as a possibility remain elusive" since this rejection "is not supported by much of the available evidence" (p. 3). What is more, the TPM posits that one of the two language systems (L1 or L2) is transferred *completely* [our emphasis] at the initial stages of L3 development provided that structural similarities are identified at an underlying level of linguistic knowledge. That said, Rothman et al. (2015) conclude that "the possibility of non-facilitative transfer is taken not only to be possible, like the L2 Status Factor (albeit for different reasons), but rather predictable" (p. 4).

Rothman et al. (2015) report a study which, in their perspective, supports the TPM view that what ultimately determines the selection of the language (L1 or L2) for transfer is the perception of typological similarities between the languages involved at a general level. The study investigated the L3 acquisition of Brazilian Portuguese by comparing two groups of learners: an L1 English with high proficiency in L2 Spanish, and an L1 Spanish with high proficiency in L2 English. The study was concerned with word order restrictions for transitive verbs and two types of intransitive verbs (unergatives and unnacusatives) in declarative and interrogative sentences. Relative clause attachment preference was also investigated. Rothman et al. (2015) state that, although Spanish and Brazilian Portuguese are typologically similar, Brazilian Portuguese matches with English to a much larger extent than does Spanish in the areas investigated. They conclude that "the data unambiguously show Spanish transfer irrespective of whether it was an L1 or L2, supporting the TPM and providing evidence against the predictions of the L2 Status Factor and the CEM" (p. 4).

Rothman et al. (2015) invoke a number of other studies which have been conducted in recent years and that, in their interpretation, corroborate the TPM view that structural similarity between the L3 and one of the source languages is the most important factor for transfer in the multilingual context. Although most of those studies have used language triads

involving two Romance languages and English (e.g., Borg, 2013; Foote, 2009; Giancaspro, Alloran, & Iverson, 2015; Ionin, Montrul, & Santos, 2011; Iverson, 2009, 2010, as cited in Rothman et al., 2015, p. 4), other studies have used other language triads and have, in Rothman et al.'s (2015) opinion, equally supported the TPM (e.g., L1 Tuvan/L2 Russian/L3 English by Kulundary & Gabriele, 2012; L1 Uzbek/L2 Russian/L3 Turkish by Özçelik, 2013; L1 Polish/L2 French/L3 English by Wrembel, 2012; L1 English/L2 Spanish/L3 Arabic by Goodenkauf & Herschensohn, 2014, as cited in Rothman et al., 2015, p. 4).

To conclude, as it became patent from the conflicting arguments presented in the three models discussed in this chapter, the debate over which language (L1 or L2) has a stronger influence on L3 acquisition is far from being settled. Hence, it is imperative that further studies in TLA are developed in order to promote a better understanding of the linguistic issues involving multilingual speakers (Leung, 2007a; García-Mayo, 2012) at initial stages of L3 acquisition. I expect to contribute to the field with the studies developed in the present dissertation, particularly with Study III (Chapter VIII) which involves L3 English learners at initial stages of acquisition. The following chapter provides detailed information regarding the methodological design that characterizes each of the studies carried out in the present dissertation.

# CHAPTER V

# METHOD

This chapter presents the methodological procedures that guided the implementation of the behavioral syntactic priming tasks in comprehension and production, the translation task, and the application of the semi-structured biographical and language questionnaire. Section 5.1 introduces the general research question guiding the dissertation, taking into account the predictions laid down in the literature concerning cross-linguistic influence and the characteristics of each task selected to carry out the field studies. In section 5.2, the research design will be delineated in general terms concerning the approach and fields of inquiry that inform the dissertation. Section 5.3 provides the educational background and profiles of the all of the participants who collaborated with the investigation. Section 5.4 lists the field research instruments and the specific goals they aimed at. Finally, section 5.5 reports the pilot study that was conducted in the first semester of 2016.

## 5.1 GENERAL RESEARCH QUESTION

The main goal of the present dissertation is to contribute to the literature on the role of previously learned languages on the acquisition of a third language. More specifically, the research is guided by the following central question: **Which of the source languages (L1 CVC or L2 EP) has a stronger influence in the processing and acquisition of L3 English datives among Cape Verdean-Portuguese bilinguals?** The dative construction was selected as the object of investigation because its fixed DO form in L1CVC and PO form in L2EP, as opposed to the alternation in L3 English (which accepts both DO *and* PO) allows the design of studies that can yield consistent responses to the research questions proposed (e.g. Melinger & Dobel, 2005; Salamoura & Williams, 2006). Besides, the dative construction has been used extensively in cross-linguistic syntactic priming research.

## 5.2 OVERALL RESEARCH DESIGN

First of all, concerning ethics in research with human beings, it is important to state that the research design was initially presented to the Ethics Committee of UFSC (*Comitê de Ética em Pesquisa com Seres Humanos* – CEPSH), but was returned to the researcher based on the fact that it was not going to be conducted in Brazilian territory and did not include Brazilian participants. Therefore all of the studies reported in the present dissertation were approved by the official representatives of the local institutions based in Cape Verde, where the studies were carried out. All participants were required to sign a consent form (see APPENDIX A) in order to take part in the studies.

The present dissertation employs a mixed-method research design, defined as a procedure for collecting and analyzing data mixing both quantitative and qualitative research methods in a single study to explore a research problem (Creswell, 2003, 2012). The choice for this method is aimed at reducing potential limitations that may result from the use of a single design and to address the research question from multiple perspectives. The strategy is called Concurrent Triangulation and is characterized by two or more methods used to confirm, cross-validate, or corroborate findings within a study. Data collection is, hence, complementary and the purpose is to combine and maximize the strengths of each method, overcoming a potential weakness of using just one.

As mentioned in Chapter I, in the present dissertation the theoretical framework is informed by three fields of inquiry: 1) Sociolinguistics, concerning language attitudes and source language preference, 2) Third language acquisition, concerning the main source of transfer into L3 English at initial stages of L3 acquisition, and 3) Psycholinguistics, concerning the organization of syntactic representation among Cape Verdean-Portuguese bilinguals learning English as L3.

## 5.3 PARTICIPANTS' BACKGROUNDS

The present dissertation counted with a total of sixty-six participants divided in two groups designated as Pool 1 and Pool 2 (see Table 1 and Table 2) in accord with their English proficiency levels that would determine the experimental task they would perform. Pool 1 was composed of thirty-six participants who were selected for the syntactic priming tasks. All were young-adult (aged 20 to 26; *M*= 22.3; *SD*= 1.6) native speakers of CVC and fluent speakers of EP as the second language, which they started learning at primary school around the age of six. They were all undergraduate students attending the last semester of the 3rd or 4th year (final) of the English Course at the University of Cape Verde.[70] Before they started to attend the English Studies Course at the university, they had attended four to six years of English classes in secondary school. Moreover, they all reported keeping regular contact with English ouside school, through TV, radio, music, books and social media. Their English proficiency levels were estimated at B1/B2 of the CEFR.

In addition, in order to ensure a certain degree of homogeneity among proficiency levels, all participants from Pool 1 were selected on the basis of having obtained a passing grade in the subjects that are concerned with the teaching of the grammars of each of the languages involved in the tasks (Cape Verdean, European Portuguese, and English). For instance, all participants had attended at least one semester (60 hours workload) in the subjects of Cape Verdean Language and European Portuguese Language at the university by the time they signed up for the experiments. Concerning the subject of English, at the third year (sixth semester) the workload amounts to a minimum of 1000 hours since there are at least four English subjects per semester, each with 60 hours workload. No participant reported impairments for reading, speaking, or writing.

[70] All participants for the syntactic priming tasks are from the University of Cape Verde because, at the time the research was conducted, the formal instruction of the CVC writing system was only offered at that university.

Table 1
*Profile of participants from Pool 1 (syntactic priming experiments)*

| Participant No. | Age | Gender | Assessed English Proficiency (CEFR) | English Course year | Workload in the subject of Cape Verdean Language (hours) | Workload in the subject of European Portuguese Language (hours) |
|---|---|---|---|---|---|---|
| 1. | 21 | M | B2 | 4th | 60 | 120 |
| 2. | 24 | F | B2 | 4th | 60 | 120 |
| 3. | 22 | F | B1 | 3rd | 60 | 120 |
| 4. | 22 | M | B2 | 3rd | 60 | 120 |
| 5. | 20 | M | B1 | 3rd | 60 | 120 |
| 6. | 21 | F | B2 | 4th | 60 | 120 |
| 7. | 25 | F | B2 | 4th | 60 | 120 |
| 8. | 20 | F | B1 | 3rd | 60 | 120 |
| 9. | 21 | M | B2 | 3rd | 60 | 60 |
| 10. | 26 | F | B2 | 4th | 60 | 120 |
| 11. | 21 | F | B2 | 4th | 60 | 120 |
| 12. | 23 | M | B1 | 3rd | 60 | 120 |
| 13. | 22 | M | B2 | 4th | 60 | 120 |
| 14. | 23 | F | B1 | 3rd | 60 | 60 |
| 15. | 23 | F | B2 | 4th | 60 | 120 |
| 16. | 21 | F | B2 | 3rd | 60 | 120 |
| 17. | 23 | M | B2 | 4th | 60 | 120 |
| 18. | 24 | M | B2 | 4th | 60 | 120 |
| 19. | 20 | F | B1 | 3rd | 60 | 120 |
| 20. | 23 | F | B2 | 4th | 60 | 120 |
| 21. | 21 | M | B2 | 4th | 60 | 120 |
| 22. | 24 | F | B2 | 4th | 60 | 120 |
| 23. | 20 | F | B1 | 3rd | 60 | 120 |
| 24. | 21 | F | B2 | 3rd | 60 | 120 |
| 25. | 23 | F | B1 | 4th | 60 | 60 |
| 26. | 22 | M | B2 | 4th | 60 | 120 |
| 27. | 24 | M | B2 | 3rd | 60 | 120 |
| 28. | 22 | F | B2 | 4th | 60 | 120 |
| 29. | 23 | M | B1 | 3rd | 60 | 120 |
| 30. | 22 | M | B2 | 4th | 60 | 120 |
| 31. | 25 | F | B2 | 4th | 60 | 120 |
| 32. | 20 | M | B1 | 3rd | 60 | 120 |
| 33. | 23 | M | B2 | 4th | 60 | 60 |
| 34. | 21 | F | B2 | 3rd | 60 | 120 |
| 35. | 24 | M | B2 | 4th | 60 | 120 |
| 36. | 23 | F | B2 | 4th | 60 | 60 |
| Average | 22.3 | | | | 60 | 111.6 |
| *SD* | 1.6 | | | | 0 | 21 |

*Note:* F= Female; M=Male; SD= Standard Deviation

Pool 2 was made up of thirty young-adult participants (15 females) who had had the maximum of 72 hours workload concerning English learning at three different English schools before they signed up for the translation task and the biographical and language questionnaire. I relied on their self-reported elementary/beginner English proficiency levels (A1/A2), which was also confirmed by their English teachers who agreed to apply the translation task and the questionnaire. All participants from Pool 2 were native speakers of CVC and fluent speakers of EP which they started learning at school from the age of six.

In addition, no participant reported having lived in an English speaking country before, and all had spent the last five years living in Cape Verde. All participants from Pool 2 reported making daily use of written CVC in social networks (though without following a writing norm, like the ALUPEC[71]) and keeping daily contact with written EP at home, school, work, and social media (newspapers, television, the internet, entertainment, etc). Their ages ranged from 18 to 35 (*M*=24.2; *SD*=3.1). None reported impairments reading and writing.

The main goal of the research with participants from Pool 2 is to verify possible relationships (or discrepancies) between their reported language preference regarding L1CVC and L2EP and their actual use of dative structures in L3 English written translations from each of the source languages. In this way, it was expected to determine whether language preference or source language was a better predictor of the actual use of dative constructions in written production. Table 2 provides the profile information of participants from Pool 2:

[71] Until 2009, CVC did not even have a writing system officially adopted by the government and, the existing one, the ALUPEC (Alfabeto Unificado para a Escrita do Cabo-Verdiano "A Unified Alphabet for the Writing of Cape Verdean Creole") was neither consensual nor of obligatory use. It was proposed in 1994 but had to undergo a long trial period before its officialization in 2009. According to Baptista (2002) "[t]he ultimate purpose of the ALUPEC is to provide a system of sign-sound correspondence that ensures the principle of linguistic economy" (p. 3). The system is presented in APPENDIX D.

Table 2
*Profile of participants from Pool 2 (questionnaire and translation task)*

| Participant No. | Age Group | Gender | Estimated English Proficiency (CEFR) | Workload in English at the time of data collection (approx. hours) | Reported preference between L1CVC and L2EP to support L3 English learning |
|---|---|---|---|---|---|
| 1. | 22 | M | A1 | 60 | L2EP |
| 2. | 31 | M | A2 | 72 | L1CVC |
| 3. | 22 | M | A1 | 60 | L2EP |
| 4. | 28 | F | A1 | 60 | L1CVC |
| 5. | 25 | F | A1 | 30 | L1CVC |
| 6. | 23 | F | A2 | 60 | L2EP |
| 7. | 24 | M | A2 | 72 | L2EP |
| 8. | 26 | M | A1 | 45 | L2EP |
| 9. | 20 | F | A1 | 60 | L2EP |
| 10. | 27 | M | A2 | 60 | L2EP |
| 11. | 24 | M | A1 | 60 | L1CVC |
| 12. | 25 | F | A2 | 60 | L2EP |
| 13. | 23 | F | A2 | 72 | L1CVC |
| 14. | 22 | F | A1 | 60 | L1CVC |
| 15. | 21 | F | A2 | 30 | L1CVC |
| 16. | 33 | M | A1 | 60 | L2EP |
| 17. | 29 | F | A2 | 60 | L2EP |
| 18. | 24 | M | A1 | 45 | L2EP |
| 19. | 25 | F | A1 | 60 | L1CVC |
| 20. | 22 | F | A1 | 60 | L1CVC |
| 21. | 20 | M | A1 | 60 | L1CVC |
| 22. | 25 | F | A2 | 60 | L1CVC |
| 23. | 24 | M | A2 | 60 | L1CVC |
| 24. | 23 | M | A2 | 60 | L1CVC |
| 25. | 23 | F | A1 | 60 | L2EP |
| 26. | 21 | M | A1 | 60 | L2EP |
| 27. | 26 | M | A1 | 45 | L2EP |
| 28. | 19 | M | A1 | 60 | L2EP |
| 29. | 24 | F | A2 | 60 | L1CVC |
| 30. | 25 | F | A1 | 60 | L2EP |
| Average | 22.3 | | | 57.7 | |
| *SD* | 1.6 | | | 9.7 | |

*Note:* F= Female; M=Male; SD= Standard Deviation

## 5.4 FIELD RESEARCH INSTRUMENTS

The research design included four instruments, each of which aimed at accomplishing a specific purpose: 1) the picture description task (PDT) to investigate the occurrence of

cross-linguistic syntactic priming in oral production; 2) the self-paced reading task (SPRT) to test the occurrence of cross-linguistic syntactic priming in comprehension; 3) the translation task to find out which source language is more likely to be used to support L3 English writing; and 4) the biographical and language questionnaire to inquire respondents on their attitudes towards the L1CVC and L2EP and their preference between the two source languages to support L3 English learning. The characteristics of each instrument and the procedures that accompanied its implementation are described in detail in the pilot study reported in the following section. Amendmends made to each instrument and procedures after the pilot are described in the "MATERIALS AND PROCEDURE" section of the respective of the three studies that compose the actual field research.[72]

## 5.5 THE PILOT STUDY

The pilot study was carried out between March and June 2016 as a way to test the effectiveness of the research design and instruments and to develop the Research Project to be presented to the Qualification Committee. With the exception of the biographical and language questionnaire which was not tested due to time limitations, all other research instruments were tested in the pilot study. The following research questions were designed from the general research question (Which of the source languages (L1 CVC or L2 EP) seems to exert a stronger cross-linguistic influence in the processing of L3 English among Cape Verdean-Portuguese bilinguals?) presented in section 5.1 above:

[72] Following the results of pilot study, the instruments and procedures were subjected to adjustments for the implementation of the actual field research. The instruments were distributed among the three studies that composed the experimental design. For instance, instrument 1 will be described in Chapter VI dedicated to the study of syntactic priming in oral production. Instrument 2 will be described in Chapter VII in the study of syntactic priming in comprehension. Instruments 3 and 4 will be part of the same study on cross-linguistic influence in written production. In this latter study the data obtained from each instrument will be combined to draw correlations between language attitudes and DO/PO use in L3 translations.

RQ1: Does syntactic priming occur between L1 CVC and L3 English for the DO construction and between L2 EP and L3 English for the PO construction in comprehension and production? If so, what is the strength of the effect in each condition and what does that tell us about the shared-separate syntax dichotomy?

RQ2: Which of the dative constructions (DO or PO) is more frequently used in L3 English written translations from L1 and from L2 among learners at initial stages of L3 English learning?

RQ3: Which of the source languages do they claim to prefer as the support language for learning L3 English? What attitudes do Cape Verdean learners demonstrate in relation to the use of the L1 CVC and of the L2 EP as evidenced in their answers to the biographical and language questionnaire?

The above listed research questions generated the following research hypotheses that were investigated in the three studies that comprise the experimental design of the pilot study:

Hypothesis 1: Syntactic priming will occur between L1 CVC and L3 English for the DO construction as well as between L2 EP and L3 English for the PO construction in comprehension and production. Yet priming effects will be stronger between L2 EP and L3 English than between L1 CVC and L3 English.

This hypothesis is based on the implicit nature of the syntactic priming tasks. Considering that both L1CVC and L2 EP are early-acquired languages, one can assume that the L2 EP has been sufficiently proceduralized among the participants who took part in the experiments. However, given the fact that the L1 CVC is the mother tongue, or as Dabène (1994) puts it, “the language of the heart” that links directly to the relational (affective) universe of the speaker, it is expected that participants are more biased towards its DO structure. Therefore, following the prediction of the inverse preference effect (Pickering &

Ferreira, 2008), L2 EP is expected to produce stronger priming effects than L1 CVC in L3 English in both comprehension and production tasks.

Hypothesis 2: The PO will prevail over its DO alternative in L3 English written translations among learners at initial stages of L3 acquisition.

This hypothesis is based on the fact that, contrary to syntactic priming tasks, translation is an explicit task, in which participants can make conscious judgements about the grammaticality of the sentences at hand. Since the PO is the structure prompted by the L2 EP which learners have been using to develop their writing skills ever since they first attended school and considering that the translation task was administered as a school-related task, it is expected that the EP is more likely to be activated in this context. Moreover, the L2 Status Factor's (Bardel & Falk, 2007) predicts that the L2 is the main candidate for transfer into the L3 for learners at the initial stages of L3 acquisition, as is the case of these participants.

Hypothesis 3: The biographical and language questionnaire[73] will reveal positive attitudes towards EP and negative attitudes towards CVC by Cape Verdean learners. The EP will be selected as the ideal support language for L3 English learning.

This hypothesis is based on the history of marginalization that the CVC has been through (Brito-Semedo, 2006; Furtado, 2010; Pereira, 2006) as well as on its present informal status which contrasts with the official status of the EP. Once more, the fact that the EP is the dominant language in the Cape Verdean educational context is expected to make the PO (induced by the EP) the preferred structure for transfer into the L3. Finally, the hypothesis is consistent with the prediction of the L2 Status Factor, again considering the explicit nature of the questionnaire and the fact that the learners are at the initial stages of L3 acquisition.

[73] Unfortunately, due to time constraints, it was not possible to apply the biographical and language in the pilot study, so the hypothesis raised here could not be tested. The hypothesis was tested in the field research and the results are reported in Chapter VIII, Study III.

### 5.5.1 Participants and setting

The pilot study counted with the collaboration of a total of fourteen participants who volunteered to perform the syntactic priming and translation tasks. All were young-adult (aged between 17 and 35) English students. They were divided into two pools of six and eight participants to make up Pool 1 and Pool 2 respectively, according to the adequacy of their English proficiency levels to each task. The six participants from Pool 1 had similar characteristics as the above mentioned participants for the actual field research. At the time of the data collection, they were all attending the last semester of the third year of the English Studies Course at the University of Cape Verde.

On the other hand, the eight participants from Pool 2 had their proficiency levels estimated at beginner to elementary (A1 to A2), like the ones described in Table 2, section 5.3 above, concerning the actual field research. These participants were recruited from private English schools in the city of Praia, the capital of Cape Verde. The estimates on English proficiency levels in each group were based on the course year they were attending at the time of the data collection and on personal oral conversations that I had with them in English.

### 5.5.2 Tasks and Procedures

Prior to describing the procedures that were used in each experimental task, it is important to report that the self-paced reading and the picture description tasks were run with the same software, *PsychoPy* (Peirce, 2007). *PsychoPy* was created by Jonathan Peirce and colleagues, with funding from the University of Nottingham. It is designed for the presentation of stimuli in text format, sounds, images or videos. It allows the recording of the reading time in milliseconds (ms) and with high precision and can be run on different operating systems like Windows and Linux. It has been used in psychophysical research, cognitive neuroscience and experimental psychology (Peirce, 2014, p. 1). Besides having free

license, *PsychoPy* has an online group (open source) that allows users to help improve the features of the program. This study used the version, 1.81.01, launched in October 2014 (the latest version at the time the experiments were carried out).

**5.5.2.1 The Self-Paced Reading Task**

The Self-Paced Reading Task (SPRT) tested two conditions in two language combinations: 1) CVC-English (DO condition); and 2) EP-English (PO condition). The SPRT pilot experiment counted with the collaborations of 6 participants who took part in the experiment as volunteers. On average, it took approximately 30 minutes for participants to complete the task in each condition, depending on the participants' reading speed. In order to avoid participant guessing, tiredness and other undesired factors, each part was realized in a different day (with a week break) according to participants' availability.

Each participant was seated comfortably in front of the computer which was positioned about 50 centimeters from his/her eyes and leveled to his/her height. The stimulus consisted of sentences[74] presented on the screen in a self-paced word-by-word reading paradigm (see Figure 2 below). The words were presented at the center of the screen in a white Arial font, size 30 on a grey background of an ASUS 16-inch widescreen monitor. The display of words was triggered by the participant's button presses. The next button press resulted in the previous word being replaced by the next word in the sentence. This was done in order to prevent the participant from visualizing when the sentence would end and make predictions about its structure.

[74] All sentences in the three languages involved were subject to grammaticality acceptability ratings by native speakers. The ratings were done using a Likert Scale from 5 (highly acceptable) to 1 (completely unacceptable). Only those sentences which were rated as "highly acceptable" or "acceptable" were used in the syntactic priming tasks (the same procedure also holds for the PDT).

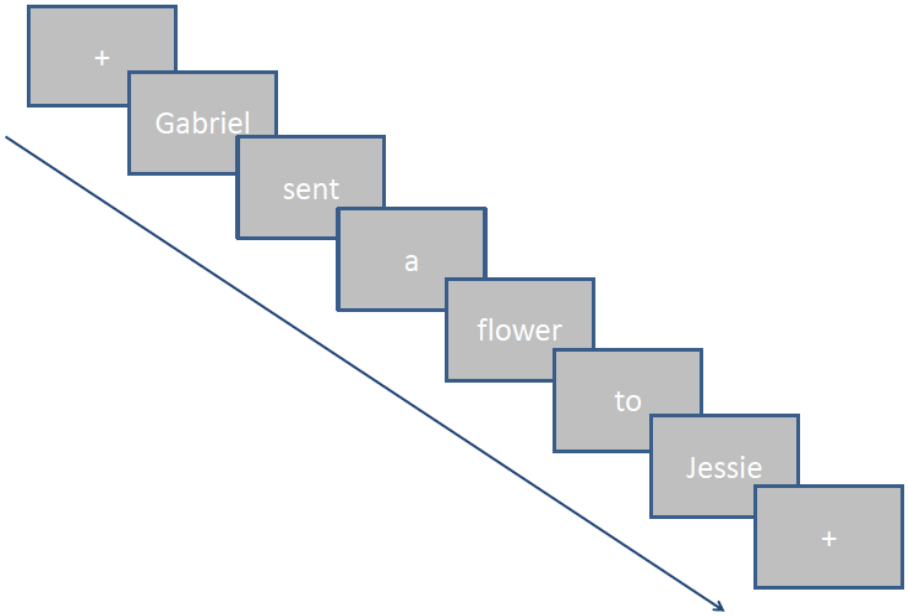



*Figure 2.* The display of an English target sentence on a self-paced word-by-word reading paradigm

The time spent on each word was determined by participants' button presses (the spacebar) and was registered by the software *PsychoPy*. Of particular importance was the time spent on the reading of the critical word, i.e., the first post-verbal object (the indirect object in DO construction; the direct object in the PO construction). The critical word signals the moment on parsing when the syntactic structure of the sentence becomes apparent (see Weber & Indefrey, 2009). This is a determining factor for the comparison of the time spent on the reading of the primed sentences in each language combination.

Each condition (DO and PO) had a list of its own with a total of 20 prime-target pairs[75]. The prime-target pair was surrounded by 3 to 5 fillers (no filler was placed between the pair), forming a set of 5 to 7 sentences. Each sentence is mediated by the display of a fixation cross ("+") signaling the end of a sentence and the beginning of another. The

[75] The dative verbs that generated the target sentences were selected from lists used in previous syntactic priming studies that had used dative constructions such as Arai et al. (2007)'s Appendix A, Loebell and Bock's (2003) Appendix B, and Pickering and Branigan's (1998) APPENDIX. These verbs have been shown to support DO and PO constructions to a similar extent. The prime dative verbs used in the L1 and in the L2 were translation equivalents of the English target dative verbs, but they were never used to build prime-target pairs.

participant was allowed to pause for processing purposes before pressing the spacebar again for the next sentence. After the last sentence in the set, a comprehension question (e.g. Did Gabriel send a letter to Jessie?) appeared, for which the participant answered “YES” or “NO” by pressing one of two “ctrl” buttons on either side of the spacebar and marked respectively green and red colors for the effect. The comprehension question was inserted to make sure participants paid attention to the task. A high number of incorrect answers would indicate participants’ lack of attention and could result in the data being discarded.

Below is an example of a sentence set in the EP-English language combination (PO condition). The third sentence (*italics*) is the prime sentence. The fourth sentence (**bold**) is the target sentence. The sentences surrounding prime and target are fillers, which constitute semantically unrelated events containing intransitives, predicative-adjective structures, reflexives, locatives, or expletive constructions:

1-O Carlos bebe muito!
2-Sandra is a beautiful woman.
3-O *João deu um livro à Maria.*
4-**Gabriel sent a flower to Jessie.**
5-O Pedro canta muito bem.
6-Berta likes white chololate.
7-There is a mouse in the kitchen.

After giving his/her answer ("YES" or "NO"), the participant pressed the spacebar again to view a fixation cross (“+”), indicating the end of the set for a pause. The participant triggered the next set by pressing the spacebar and the same procedure was repeated until all the sentences in every set had been read.

After the last sentence of the last set was read a “THANK YOU” note appeared on the screen to close the experiment. The implementation of the experiments was preceded by a trial phase to allow participants to familiarize with the task procedures for as long as necessary.

#### 5.5.2.2 The Picture Description Task

The Picture Description Task (PDT) was adapted from Loebell and Bock (2003). As with the SPRT, this task tested two conditions: 1) CVC-English (DO condition); and 2) EP-English (PO condition). The PDT experiment counted with the collaboration of the same 6 participants who realized the SPRT tasks, again as volunteers. Again, in order to avoid participant guessing, tiredness and other undesired factors, each part was implemented in different days (with a week in between) according to participants' availability. Each participant was seated comfortably in front of a computer which was positioned about 50 centimeters from his/her eyes and leveled to his/her height. The stimuli were presented in self-paced manner in the same monitor used for the SPRT. However, in this task the participant's button presses elicited the display of full sentences.

In each condition there was a list with 20 prime sentence-target picture pairs per set. In addition to the priming materials, there were sixty filler sentences and forty filler pictures. In each set, the target picture was immediately preceded by the prime sentence, which in its turn was preceded by two or three filler sentences in the prime and target languages and two filler pictures. The filler and target pictures were colored line-drawings on white backgrounds adapted from publicdomainvectors.org which offers copyright-free vector images for the public domain (see Figure 3 for an example of a target picture and Figure 4 for an example of a filler picture). The target picture contained three entities corresponding to the thematic roles of agent, patient, and theme, illustrating a dative event which the participant could describe using either a DO or a PO construction. Yet the dative event illustrated was always different from the one read in the prime sentence.

Participants were instructed to describe the target and filler pictures orally in English. All pictures were labeled with keywords (NPs and verbs) to restrict the descriptions so that

undesired forms were not produced for the target pictures. Care was taken so that the labeling would not influence the structuring of the sentences during the description of the target pictures. In each set, the prime sentence was always in the prime language and the filler sentences involved English and the prime language. The filler pictures elicited semantically unrelated events that could never be described using the target structures (datives).

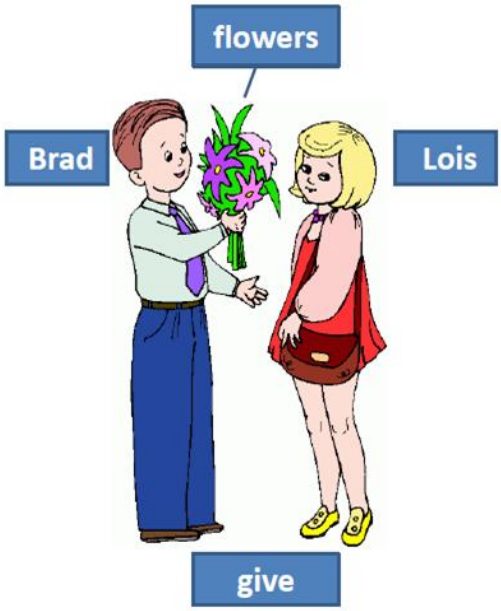



*Figure 3.* Example of a target picture labeled with cues to elicit a dative construction


*Figure 4.* Example of a filler picture labeled with cues to elicit an intransitive construction

The experiment used the guise of a memory task in order to prevent participants from paying attention to language. The filler pictures were used for this purpose, so after the presentation of the last picture in each set, a recognition question popped up asking "Have you seen this picture before?"; the picture was displayed underneath the question to elicit a "YES" or "NO" answer from the participant, who then pressed the "YES" or "NO" button specified on the keyboard. The question referred back to one of the filler pictures presented earlier or to the target picture preceding it.

After giving his/her answer ("YES" or "NO"), the participant pressed the spacebar again to view a fixation cross ("+") in the center of the screen, indicating the end of the set for a pause. The participant triggered the next set by pressing the spacebar and the same procedure was repeated until all of the items in each set had been covered. The experiment closed with a "THANK YOU" note on the screen. A trial phase preceded the implementation of the experiments to allow participants to familiarize themselves with the task procedures for as long as they deemed necessary. The completion of the task too, on average, 20 minutes.

#### 5.5.2.3 The Translation task

The translation task was used in the pilot to assess participants' use of the targeted structures (datives) in the two language combinations in writing. A total of eight participants volunteered to perform the task. Their proficiency levels were estimated between beginner and elementary level (A1-A2). The task consisted in the translation from L1 to L3 or from L2 to L3 of a text in the form of dialogue containing around 300 words. Each text included six instances of the target dative structures covert by the other sentences in the dialogue. The two texts had the exact same content expressed in translation equivalents. Hence, each participant would only translate one of the texts. They were given 40 minutes to complete the task. Since the research was only concerned with exploring the use of the syntactic structure, to prevent vocabulary issues as a potential factor, all participants were allowed to use a dictionary to consult unknown words. The task was completed at an average of 25 minutes per participant.

For the analysis, the sentences were examined in terms of the extent to which the dative structure prompted by the source language in the original text (DO from L1CVC or PO from L2EP) was reused in the participants' written translations. The results would provide preliminary information about the preference between L1CVC and L2EP as source languages to support writing in the L3 English among participants at initial stages of L3 acquisition.

### 5.5.3 Discussion of results

The L1-L3 SPRT tested the hypothesis that the L1 primes would elicit a decrease in reading times for L3 targets for DO constructions, particularly at the critical region (word 3 and word 4). The L2-L3 SPRT tested the same hypothesis regarding the PO construction, i.e., that the target L3 would be read faster, following the L2 primes in PO. The pilot experiments, however, did not confirm these hypotheses as illustrated in Figure 5 and Figure 6 below. For purposes of illustration, Table 3 and Table 4 provide an example of one pair (of a total of twenty pairs) of prime-target sentences that were read. Table 3 shows an example corresponding to the words in Figure 5, and Table 4 to the words in Figure 6:

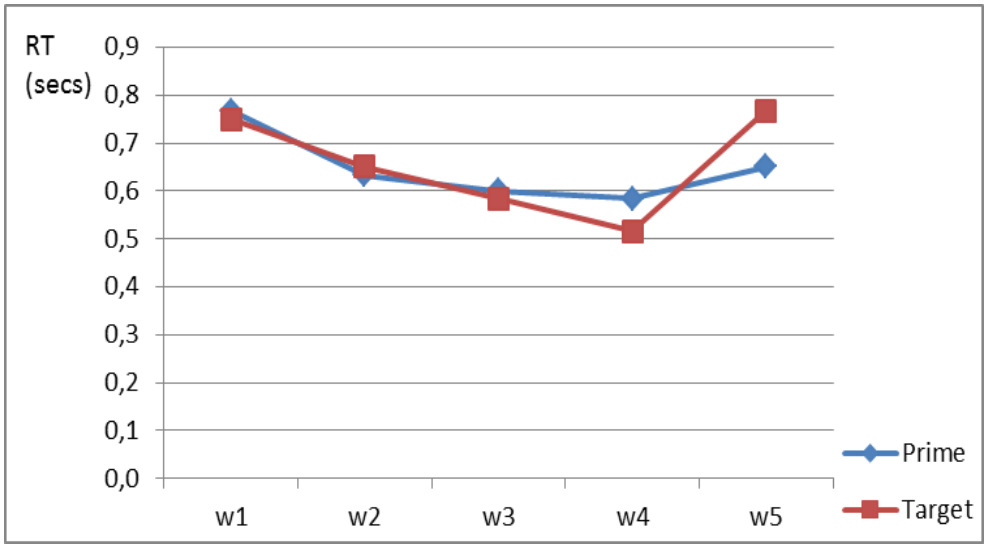



*Figure 5.* Condition 1: L1 (CVC) - L3 (English)

Table 3
*Double-Object Dative Structure with Example Sentences for Condition 1*

| | Word 1 (w1) | Word 2 (w2) | Word 3 (w3) | Word 4 (w4) | Word 5 (w5) |
|---|---|---|---|---|---|
| CVC (prime) | Carla | bêndi | Lúcia | un | bluza. |
| English (target) | Thomas | bought | Jessie | a | rose. |

Figure 5 presents the mean reading times (of a total of 20 prime-target pairs) for each prime and target word read by the six participants who carried out the task in the CVC-English condition. No difference in reading time was observed for the first three words of the target sentences read after the primes. There is a tendency for words to be read faster from Word 1 (w1) to Word 4 (w4) for both primes and targets, but it is inverted at Word 5 (w5). The only target word that is read faster is Word 4 (w4), but the difference for the prime seems insignificant[76]. Target Word 5 (w5) is read even slower than its prime counterpart. No difference is observed for the reading of the critical word (w3) for prime and target. Together, results signal an absence of priming effects.

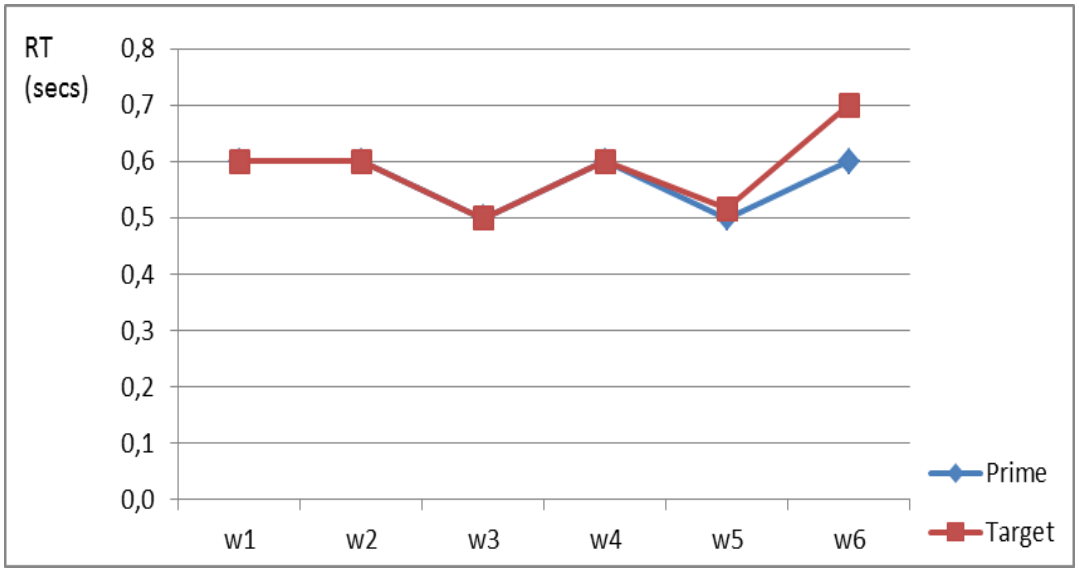



*Figure 6.* Condition 2: L2 (EP) - L3 (English)

Table 4
*Prepositional Object Dative Structure with Example Sentences for Condition 2*

| | Word 1 (w1) | Word 2 (w2) | Word 3 (w3 | Word 4 (w4) | Word 5 (w5) | Word 6 (w6) |
|---|---|---|---|---|---|---|
| EP (prime) | Paula | deu | um | colar | à | Joana. |
| Eng. (target) | Sandra | made | a | cake | for | Anna. |

[76] A statistical test (t-test) using the R statistical software package would provide a better idea of the significance of the difference in reading times between primes and targets. But due to the small sample size (only six participants) it was not performed because the results would not be reliable.

Figure 6 presents the mean reading times (of a total of 20 prime-target pairs) for each prime and target word read by the six participants who carried out the task in the EP-English condition. No difference in reading time was found for the first five words of the target sentences after the primes. In fact, no target word is read faster than its prime counterpart. However, a decrease in the reading time of the critical word (w3) is observed to the same extent for both prime and target. Yet, it is followed by an increase in the reading time of the next word. Target Word 6 (word 6) is read even slower than its prime. As with the CVC-English condition, these results do not show syntactic priming effects.

There can be several reasons why the situations described in Figure 5 and Figure 6 happened, first of which, related to the reduced number of participants (six). But it might also be the case that the amount of stimuli is small (only one prime is used for each target) or the manner in which the stimuli are presented may not be adequate to find priming effects. Moreover, the literature on priming in comprehension associates priming effects to a lexical boost. According to Ledoux et al. (2007) "priming effects (…) that have been reported [in comprehension] have depended on the repetition of verbs across sentences (p. 135)." In this study's experiments, verb repetition was avoided to ensure that any priming effects found were due primarily to the abstract structure of sentences (syntax).

The picture description task tested the hypothesis that L1 primes would elicit significantly more DO constructions than PO constructions in participants' picture descriptions in L3. Likewise, it was also hypothesized that L2 primes would be followed by more PO constructions than DO constructions. The first hypothesis was not confirmed by the pilot as the numbers of DO and PO were almost equivalent (with a slight bias towards PO) following L1 primes. The second hypothesis, however, was confirmed as the number of PO

constructions was greater than that of the DO following L2 primes. The two cases are illustrated in Figure 7 and in Figure 8 below:

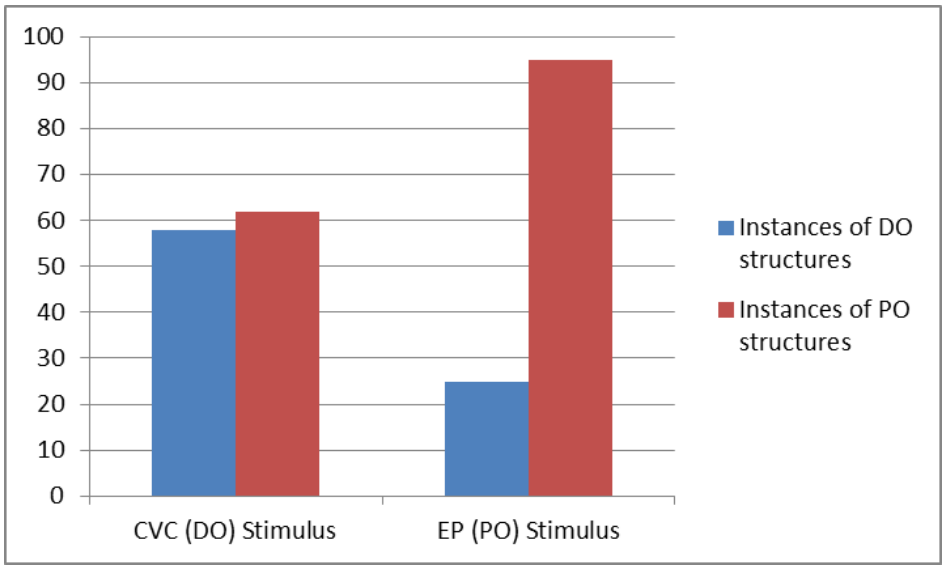



*Figure 7.* Instances of DO and PO structures produced after CVC and EP stimuli

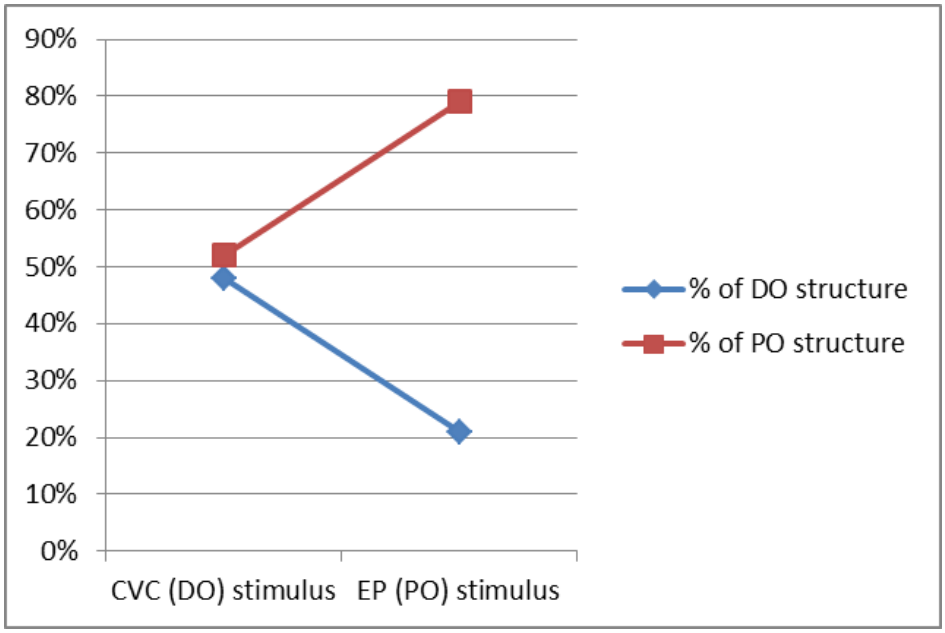



*Figure 8.* Percentages of DO and PO structures produced after CVC and EP stimuli

Figure 7 shows a slight tendency for participants to produce PO structures in English after CVC (DO) stimulus. The difference is small[77], however, with 62 occurrences of PO structures against 58 structures in DO when describing dative pictures in English. On the other hand, when the stimulus is in EP (PO) the difference is greatly enlarged, with 95 occurrences in PO against 25 in DO. Figure 8 shows these numbers in percentages.

If in the EP-English condition the six participants who performed the task seemed to have a preference for the PO structure to describe dative situations in English, in the CVC-English condition this preference was not so obvious, albeit there was a slight tendency towards the PO structure over the DO structure. As the experiment was not preceded by a baseline phase (see McDonough & Trofimovich, 2009, p. 101) due to time constraints, it was unclear whether these participants already had these preferences before performing the task or whether their choice of structures were prompted by the stimuli alone.

The issue of preference is vital to determine whether a priming effect actually takes place because the *inverse-preference effect* (Pickering & Ferreira, 2008) suggests that the effects of syntactic priming are more apparent in the structures that are less favored by the speakers. For instance, if the PO is the preferred structure among the participants who carried out the PDT, then the DO prime produced an effect because there was almost the same number of occurrences of PO and DO structures following the DO primes. On the other hand, when the prime was in PO the same thing cannot be said because participants would be already biased to producing the PO structure, which in turn would have been facilitated by the absence of a DO prime and reinforced by the presence of the PO prime.

[77] A statistical test using the mixed logit models in the R software package would provide an appropriate figure of the significance of the difference between the DO and PO responses after the primes. Again, due to the small sample size (only six participants) would not yield reliable results, so it was not performed.

The translation task explored cross-linguistic syntactic influence in writing. It tested the hypothesis that the PO (available in the L2EP) would be used more frequently in the L3 English written translation than its DO alternative (prompted by the L1CVC). Four participants completed the task, all of which had English proficiency levels estimated between A1 and A2 of CEFR. Table 5 shows some examples of the translations from L1 into L3:

Table 5
*Translation from L1 into L3*

| Participant Number /Estimated English proficiency level | Example of L1 sentence /phrase | Participants' translations into L3 (Participant No./Proficiency level) |
|---|---|---|
| P1/A2<br>P2/A1<br>P3/A1<br>P4/A2 | 1) Pedro oferesi Joana un jóia. | "Pedro offer Joana a jewel." (P2/A1; P3/A1)<br>"Pedro offers Joana a jewel." (P4/A2)<br>"Pedro offered Joana a jewel." (P1/A2) |
| | 2) Joana mostra Júlia anel. | "Joana show Julia ring." (P2/A1)<br>"Joana showed Julia ring." (P4/A2; P3/A1)<br>"Joana showed Julia that ring." (P1/A2) |

Table 5 shows that the participants consistently used the same dative structure (DO) prompted by the L1CVC in their L3 English written translation. This fact contradicts the prediction laid down in hypothesis 2 that the PO would be prevail in L3 English written translations among learners at initial stages of L3 acquisition.

Nevertheless, let us look at the second text which was to be translated from L2EP to L3 English. The remaining four participants (of the group of eight participants) completed this task. All had English proficiency levels estimated between beginner and elementary levels (A1 and A2, respectively). Table 6 provides some examples of the sentences translated from L2EP into L3 English:

Table 6
*Translation from L2 into L3*

| Participant Number /Estimated English proficiency level | Example of L2 sentence /phrase | Participants' translations into L3 (Participant No./Proficiency level) |
|---|---|---|
| P5/A1<br>P6/A2<br>P7/A1<br>P8/A1 | 1) O Pedro ofereceu uma jóia à Joana. | "The Pedro ofereced a jewel for Joana." (P8/A1)<br>"The Pedro offered a jewelry to Joana." (P7/A1)<br>"Pedro oferred a jewel to Joana." (P5/A1)<br>"Pedro gived a precious stone to Joana." (P6/A2) |
| | 2) A Joana mostrou o anel para a Júlia. | "The Joana shoued the ring for the Julia." (P8/A1)<br>"The Joana showed the ring to the Julia." (P7/A1)<br>"Joana showed the ring Julia." (P5/A1; P6/A2) |

The second translation, from L2 to L3, confirmed the tendency observed in the previous task, that the structure prompted by the source language is reused in the target language. While the reuse of the PO from the L2EP in the L3English written translation is in line with hypothesis 2, the fact that the DO was also transferred in the previous task leads to the rejection of the hypothesis.

### 5.5.4 Limitations and improvements for field research

The central reasons motivating the realization of the pilot study were, firstly, to test the effectiveness of the tasks and procedures in order to correct possible mistakes in the instruments and, secondly to find preliminary indicators of which of their source languages Cape Verdean-Portuguese bilinguals rely the most on to process dative structures into L3 (English). The pilot did not confirm the hypotheses laid down for the syntactic priming tasks. On the one hand, the SPRT experiments showed no priming effect in either language combination. If this result is maintained in the field research it would suggest an absence of

interaction between the linguistic representations in the mind at the level of syntax, offering support to the separate syntax account and denying the shared-syntax account.

On the other hand, the PDT showed more productions of the PO structures compared to DO structures, even when the stimulus was in DO. This tendency contradicts the data in McDonough and Trofimovich (2009) presented in the review of literature showing the prevalence of DOs (L1 CVC) over POs (L2 EP) even when the stimulus are in POs. Conversely, it gives support to the L2 Status Factor and the prediction that, in the multilingual context, the L2 is the most probable candidate for transfer into the L3.

I expected, however, that these tendencies would be inverted in the field research, after the adjustments in the design of the tasks. The pilot experience revealed some issues to be tackled in the design of the tasks for the field research. In the SPRT, for both conditions, there was only one prime per target and there was no verb repetition. Syntactic priming literature shows that effects in comprehension depend either on lexical repetition or translation equivalent (e.g. Ledoux et al. 2007; Weber & Indefrey) or on the reinforcement of the prime stimulus (Pickering & Branigan, 1998; Thothatiri & Snedeker, 2008; Hsieh, 2016). Hence, it was not clear what might have caused the absence of priming effects, particularly for the SPRT. The field research follows the latter procedure, i.e., the target sentence will be preceded by two prime sentences (PP-T). Also, the words presented on the monitor screen for an unlimited time, allowing participants to reflect on the language as they controlled the pace at which the words appeared. It was decided that, for the field research, each word would remain on the screen for a maximum of 3 seconds and then disappear, in order to stimulate faster reading pace.

As for the PDT, it was also not clear whether the participants already had their preference for the PO structure or whether their productions of PO were influenced by the L2

PO structure. The fact that the PDT was not preceded by a baseline phase made it difficult to interpret the results in relation to the presence or absence of syntactic priming effects. This was an important correction that would be introduced in the research design for the field experiments before carrying out the syntactic priming tasks. Since the baseline phase elicits participants' productions freely, i.e., without submitting them to any primes it would be possible to compare their productions prior to and after the development of the tasks and make inferences, particularly for the PDT.

With regard to the translation task, they provided the data on explicit processing that were contrasted with the data on implicit processing prompted by the syntactic priming tasks. A crucial amendment that will be included in the actual field research is the introduction of the data obtained through the biographical and language questionnaire, regarding participants' language preference between the L1CVC and L2EP to combine with the translation task as a way of determining the most probable source of cross-linguistic influence for dative structures, i.e., if it resides in the dative structure of the language prompted by the original text (DO from the L1 or PO from the L2) or if it is constrained by the source language bias expressed in the answer to the questionnaire, irrespective of the structure in the original text.

Overall, the experience of the pilot was very useful to help understand how to approach participants during the field research for an effective implementation of the syntactic priming and translation task. Most importantly, despite the issues pointed out, above with respect to the syntactic priming tasks, no participant was able to detect what was actually being tested. This is an extremely positive aspect because it means that the memory masks were effective in each condition. Hence, the implicit nature of the tasks was preserved. The following chapters will report the results of the studies conducted in the actual field research, for which the constraints identified in the pilot study were amended.

# CHAPTER VI

# STUDY I: INVESTIGATING CROSS-LINGUISTIC SYNTACTIC PRIMING IN ORAL PRODUCTION

In this chapter I report the results of Study I on cross-linguistic syntactic priming in the oral production modality. The participants who took part in this study belong to Pool 1, described in Chapter V, section 5.3. The aim of the present study is to find out whether syntactic priming occurs between L1 CVC and L3 English for the DO construction as well as between L2 and L3 English for the PO construction, the strength of the effects in each condition, and the implications for residual activation versus implicit learning accounts and for the discussion on whether bilinguals keep separate or shared syntactic representations.

The chapter opens with section 6.1 with the reformulation of the general research question introduced in Chapter V, section 5.1 into specific research questions and hypotheses relating to the context of the syntactic priming experiment conducted for the purposes of Study I. Section 6.2 describes the preparation of the participants and setting for the implementation of this specific syntactic priming task. Then, in section 6.3 and subsections, the materials created for the implementation of the baseline (unprimed) phase and picture description task are presented, followed by a detailed description of the procedure that guided the experiments with the aim of generating adequate quantitative data to respond to the research question. Next, section 6.4 presents the statistical tests that were selected for the analysis of the data within and between conditions. The chapter closes with section 6.5 which provides an in-depth discussion of the results in the light of the relevant literature on cross-linguistic syntactic priming in production presented and discussed in the theoretical background of this dissertation.

## 6.1 RESEARCH QUESTIONS AND HYPOTHESES

The present dissertation revolves around the central research question pertaining to the role of previously learned languages in the processing and acquisition of L3 English datives. To this end, it is important to understand the nature of the bilingual syntactic representation that has been investigated by means of the syntactic priming paradigm that taps into implicit mental processing mechanisms to reveal facilitation effects in the production of a given sentence structure after the speaker has been exposed to the similar structure. Study I aims to investigate these issues by raising the following specific research questions:

RQ1: In which condition (DO/CVC-prime or PO/EP-prime) are significant syntactic priming effects more likely to occur?

RQ2: Will the structure bias of the target verbs presented with the pictures significantly modulate priming effects in each condition?

RQ3: What do the results of the picture description task suggest about the linguistic representations in each language pairing tested? What do they suggest about the implicit learning account vs. residual activation account?

In the light of the relevant literature on cross-linguistic influence and syntactic priming, as well as the current sociolinguistic context in which the experiments are carried out, the following hypotheses were advanced in response to the research questions:

H1: Significant syntactic priming effects will occur in the PO/EP-prime condition, but not in the DO/CVC-prime condition.

This hypothesis is based on the fact that the L1 CVC is the dominant language when it comes to oral production in daily language use. Since the PDT is an oral-based task, participants are expected to be more biased towards the DO structure prompted by the L1 CVC. Following the prediction of the inverse preference effect (Pickering & Ferreira, 2008)

as well as of the surprisal-sensitive persistence (Jaeger & Snider, 2007), it is expected that the structure that is less preferred by the speaker is the one that is susceptible to yield stronger priming effects, in the case the PO structure.

H2: The structure bias of the prime and target verbs[78] will not significantly modulate syntactic priming effects.

Given the considerable level of intuitiveness that verb structure bias entails and, taking into account the intermediate English proficiency level of the participants (B1/B2), participants are not expected to use the target verbs in a manner that consistently approaches the pattern exhibited among native speakers of English as described in the literature (see Bock, 1989; Bock & Griffin, 2000; Kutta et al., 2017).

H3: The results of the picture description task will provide support for the shared syntax account and in favor of implicit learning account.

The occurrence of syntactic priming effects between two languages is interpreted as evidence for shared syntax (Loebell & Bock, 2003; Schoonbaert et al., 2007; Bernolet et al., 2007; Hartsuiker et al., 2016). Regarding the implicit learning-residual activation account, since the experiment was designed so that prime sentences and target pictures never shared the same lexical items (in the form of translation equivalents), the pictured event was never related to that of the prime sentence. Also, for the reason stated in H2 above, target verb structure bias is not expected to constrain priming effects. Hence, any priming effects found would be more consistent with the implicit learning account that advocates for a structural source of priming across languages (Bernolet & Hartsuiker, 2010; Loebell & Bock, 2003).

[78] A lot of studies have focused on the effects of prime verb bias to modulate syntactic priming, but "less research has been done on the interaction between structural priming and verb bias of the verb in the TARGET [authors' emphasis] sentence" (Kootstra & Doedens, 2016, p. 713). Therefore, the present study will focus on investigating the influence of target verb bias in syntactic priming effects.

## 6.2 PARTICIPANTS AND SETTING

Study I counted with the participation of thirty-six (36) young adult (aged 20 to 26; *M*=22.3; *SD*=1.6) Cape Verdean-Portuguese bilingual students (20 females), attending the last semester of the third or fourth year (last) of the undergraduate English Studies Course at the University of Cape Verde. Prior to enrolling in the English Studies Course at the university, they had attended four to six years of English classes in secondary school. In addition, they all reported keeping regular out-of-school contact with English through traditional and social media and books. Their English proficiency levels were estimated at B1/B2 of the CEFR (for more on participants' backgrounds please revisit section 5.3 above about participants from Pool 1) based on the researcher's oral conversations with each participant, before, during and after the experiments.

## 6.3 MATERIALS AND PROCEDURE

The present PDT study was carried out using version 1.81.01 of *PsychoPy* launched in October 2014 (the latest version at the time the experiments were carried out) (Peirce, 2007). The experiments consisted in the testing of two conditions (DO/CVC-prime and PO/EP-prime) implemented separately with the minimum of a week between them. In each condition there was a list with 22 prime sentence-target picture pairs, sixty filler sentences (30 in each of the two languages involved in each condition) and sixty filler pictures. All of the sentences in the three languages involved were subject to grammaticality acceptability ratings by native speakers. The ratings were done using a Likert Scale from 5 ("highly acceptable") to 1 ("completely unacceptable"). Only those sentences which were rated as "highly acceptable" or "acceptable" were used in the experiment. The dative verbs that generated the prime sentences were translation equivalents of verbs selected from lists used in previous syntactic priming studies in production that had used dative constructions such as Loebell and Bock's

(2003) Appendix B, and Pickering and Branigan's (1998) APPENDIX. The filler and target pictures were colored line-drawings on white backgrounds adapted from publicdomainvectors.org, which offers copyright-free vector images for the public domain.

The prime sentences depicted a dative event in DO or in PO, depending on the condition. The filler sentences described semantically unrelated events containing intransitives, predicative-adjective structures, reflexives, locatives, or expletive constructions. Each target picture contained three entities that corresponded to the thematic roles of agent, patient, and theme to illustrate a dative event which could be described using either a DO or a PO construction. Yet the dative event illustrated was never the same as the one read in the prime sentence. Likewise, the filler pictures depicted events that could never be described with dative structures (e.g. a man running or a couple dancing). The study was preceded by a baseline phase[79] to determine participants' bias towards the DO or PO structure prior to the implementation of the primed experiments.

### 6.3.1 The Baseline Phase

The PDT experiments were preceded by a baseline phase to elicit participants' productions freely, i.e., without submitting them to any primes. In this way, it would be possible to compare their productions prior to and after the development of the tasks in order to arrive to reliable conclusions regarding the effect of the stimuli that were presented to them. The baseline materials consisted in the presentation of twenty-two target pictures which elicited either the DO or the PO construction and sixty filler pictures that elicited alternative structures (locatives, predicative objects, intransitives, etc). Each target picture was separated by two, three, or four filler pictures.

[79] The results obtained in the baseline also informed the self-paced reading task reported in Chapter VII, Study II.

All pictures were labeled with keywords (NPs and verbs) to ensure that undesired forms were not produced for the target pictures The labeling was done placing the words in a circular fashion around the picture (above, below, and on the lateral parts), so that it would not influence the participant's structuring of the sentences during the description of the target pictures (see Figure 3 and Figure 4 above for an example of a target picture and of a filler picture, respectively).

It is also important to mention that the task was designed taking into account the issue of whether the choice between DO and PO construction in the baseline phase would be influenced by the syntactic preference of the target verbs placed underneath the pictured events, in order to compare with the primed conditions to find out if the strength of the primes were modulated by the alternation bias of the target verbs. In this sense, the verbs were carefully selected, considering their different structural preference (Bernolet & Hartsuiker, 2010; Jaeger & Snider, 2007; Malchukov et al., 2007; Rappaport Hovav & Levin, 2008) to create balance in the experiment (see APPENDIX C1).

### 6.3.2 The Primed Conditions

The picture description task (PDT) was adapted from Loebell and Bock (2003)[80]. The task tested two conditions: 1) DO/CVC-prime condition (L1 CVC – L3 English pairing); and 2) PO/EP-prime condition (L2 EP – L3English pairing). The PDT experiment counted with the collaboration of 36 students who volunteered to take part in the task. Each condition was implemented in different days (with a week in between) at the participants' convenience in order to avoid participant tiredness, guessing and other undesired factors.

[80] As in Loebell & Bock (2003), the study reported here was not concerned with measuring the reaction times (ms) of the participants at the onset of the stimuli. Rather, the goal was to determine the frequency with which each dative structure would be used after the prime, and then compare with the baseline to verify the occurrence (or not) of priming effects. Therefore, the chronometric off-line measurements registered by the software were not informative in this experiment.

The experiments were conducted in a classroom provided by the English Coordination, offering optimal conditions for their implementation. Each participant sat comfortably in front of a computer which was positioned about 50 centimeters from his/her eyes and leveled on a desk to his/her height. The presentation of the stimuli was done on an ASUS 16-inch widescreen monitor, using white Arial font, size 30 on a grey background. The items consisted in full sentences and pictures triggered by participants' button presses in a self-paced manner.

In each set, the prime sentence was immediately followed by the target picture, and the pair was preceded by two to four filler sentences and two filler pictures. Participants were instructed to describe the target and filler pictures orally in English. All pictures were labeled with keywords (NPs and verbs) to restrict the descriptions so that undesired forms were not produced for the target pictures. Care was taken so that the labeling would not prompt the structuring of the sentences during the description of the target pictures (see Figure 3 above). Figure 9 shows an example of a trial in one of the conditions (PO/EP-prime):

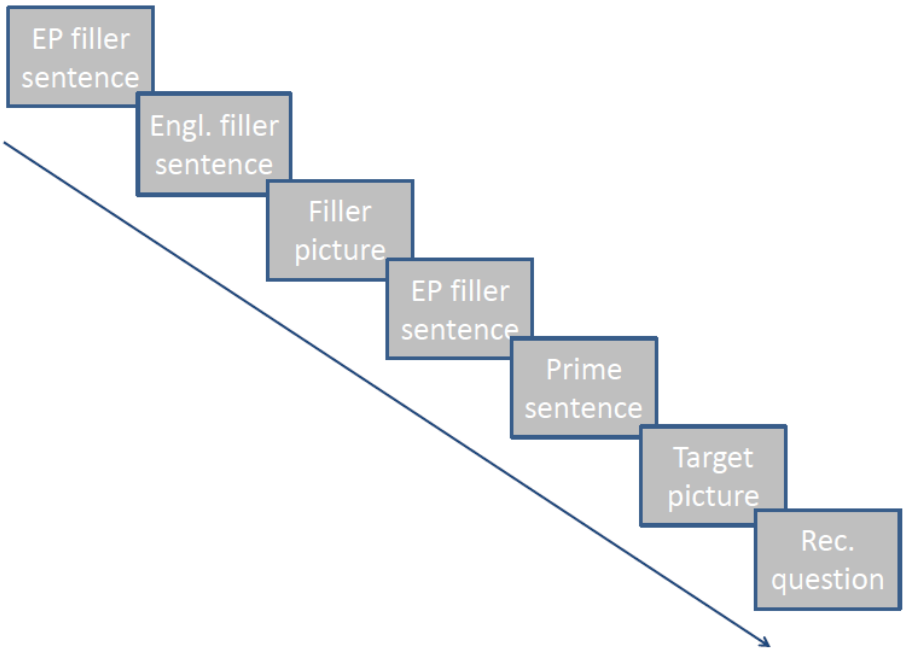



*Figure 9.* Example of a trial sequencing in the PO/EP-prime condition
*Note:* Engl.= English; Rec.=Recognition

The experiment was masked as a memory task in order to deviate participants' attention from language. The filler pictures were important in this respect, so that, after the presentation of the target picture in each set, a recognition question appeared asking "Have you seen this picture before?"; the picture was displayed underneath the question to elicit a "YES" or "NO" answer from the participant, who then pressed the "YES" or "NO" button specified on the keyboard. The question referred back to one of the filler pictures presented earlier or to the target picture preceding it.

After giving his/her answer ("YES" or "NO"), the participant pressed the spacebar again and a fixation cross ("+") appeared in the center of the screen to signal the end of the set. The next set was triggered by pressing the spacebar and the same procedure was repeated until all of the items in each set had been covered. The experiment was closed with a "THANK YOU" note on the screen. The experiments were preceded by a trial phase to allow participants to become familiar with the task procedures for as long as they considered necessary. Participants took, on average, 30 minutes to complete the task in each condition.

Following the procedure in Loebell and Bock (2003), the conditions were counterbalanced[81] in each session, so that approximately half of the participants started with the DO/CVC prime and the remaining participants with the PO/EP prime in session 1. In session 2, the process was inverted so that the participants who had completed the DO/CVC prime condition would now complete the PO/EP condition, and vice-versa. The following section will explain the procedure adopted for the realization of the statistical analysis of the data.

[81] There were counterbalancing errors which resulted from some participants' unavailability to meet with the researcher on the assigned dates. This created some confusion with the dates of each session. Consequently, the counterbalancing was not done adequately with exactly two halves of the participants performing alternate conditions in each session. The majority of the participants (20) performed the DO/CVC-prime condition first.

## 6.4 DATA ANALYSIS

Given the characteristics of the data which contains a binary categorical dependent variable (DO and PO) that is binomially distributed[82], and given "the inadequacy of ANOVA over categorical outcomes" (Jaeger, 2008), I follow the recommendation in Jaeger (2008) for the use of mixed logit models for categorical data analysis (CDA) using the statistics software package R. Mixed logit models have been recurrently employed in a number of recent syntactic priming studies involving production (e.g. Bernolet & Hartsuiker, 2010; Hartsuiker, et al., 2016; Jaeger & Snider, 2013; Kaschak et al., 2011; Kootstra, Van Hell, & Dijkstra, 2010; Kutta et al., 2017; Segaert et al., 2014). The use of the models entails a logit-transformation of the categorical answers (e.g. in the present study, PO and DO are coded as 0 and 1, respectively) to fit the logit link function selected in an R package.

That said, the data in this study were analyzed using Generalized Linear Mixed Model fit by maximum likelihood (Laplace Approximation) in the sjPlot package, calculated with the function sjp.glmer (Ludecke, 2017) in R package (version 2.4.0 available at: https://CRAN.R-project.org/package=sjPlot). The analysis was carried out from multiple perspectives: 1) Context 1, using BASELINE and PO/EP-prime as fixed factors; 2) Context 2, using DO/CVC--prime and BASELINE as fixed factors; and 3) using PO/EP-prime and DO/CVC-prime as fixed factors.

On a first moment, the analysis was done without target verbs as fixed factors. Then, a separate analysis was done with target verbs as fixed factors to find out if target verb structure bias influenced the significance of the syntactic priming effects found (the analysis will be

[82] This means that, of the two possible answers, only one answer can be given in each trial (either DO or PO), which renders them mutually exclusive. Mixed logit models target the participants responses directly, without the need to resort to the mean response in each condition.

presented only for the condition in which syntactic priming occurs). Participants were always used as random factors. These analyses are explained in detail in the following section.

## 6.5 RESULTS AND DISCUSSION

The baseline yielded a total of 792 answers in dative structures. Of these, 95 were in DO and an astonishing 697 were in PO. This number leaves no shadow of doubt regarding the participants' bias towards the PO structure in the absence of a prime sentence to influence their choices, given the fact that the verbs presented to them were balanced as to their DO and PO preferences. With the exception of *return* which is strongly biased towards the PO and *show* which is more fond of the DO, all other target verbs presented with the pictures seem to support the DO and PO structures to a relatively similar degree (see Malchukov et al., 2007; Rappaport Hovav & Levin, 2008). After the introduction of the DO/CVC-prime condition, the figures change drastically, with 381 DOs against 411 POs. The PO/EP-prime condition renders very similar results as the baseline, with 133 DOs against 659 POs. These figures are displayed in Table 7, showing the variation of the percentage of DO responses in each experimental condition.

Table 7
*Raw numbers of DO and PO answers and percentage variation of DO responses in each condition of the PDT experiment.*

| Condition | DO answers | PO answers | % variation of DO |
|---|---|---|---|
| Baseline | 65 | 697 | 8.2 |
| DO-CVC prime | 381 | 411 | 48.1 |
| PO-EP prime | 133 | 659 | 16.7 |

The variation of the percentage of the DO in response to the prime conditions, particulaly the escalating increase from 8% in the baseline to 48.1% in the DO/CVC-prime condition, is demonstrative of the impact that the DO structure (prompted by the L1 CVC) had on participants' choices of the dative structure to describe the pictured event presented to

them. Nonetheless, it is also noticeable that the bias for the PO contruction remained even in the DO/CVC-prime condition. The unexpected increase of the DO in the PO/EP-prime condition might be related to the failure to implement an adequate counterbalancing of the 36 participants, so that the first eighteen participants would start with the DO/CVC-prime and the remaining eighteen with the PO/EP-prime in session 1, and then switch in session 2. However, given the small difference in the increase of the percentage (8 to 16), I assume, for the moment, that it was only incidental. The significance level of this increase will be determined in the analysis of the fixed effects with the generalized linear-mixed model fit by maximum likelihood (Laplace Approximation) in R.

A close look at Figure 10 will help to better illustrate what happens in the three experimental conditions. The X- axis displays the baseline condition (labeled as NP= No Prime) in the center, the DO/CVC-prime condition (labeled as CV) on the left, and the PO/EP-prime condition on the right (labeled as EP). The Y-axis shows the proportion of DO (coded as 1) and PO (coded as 0) responses for each condition:

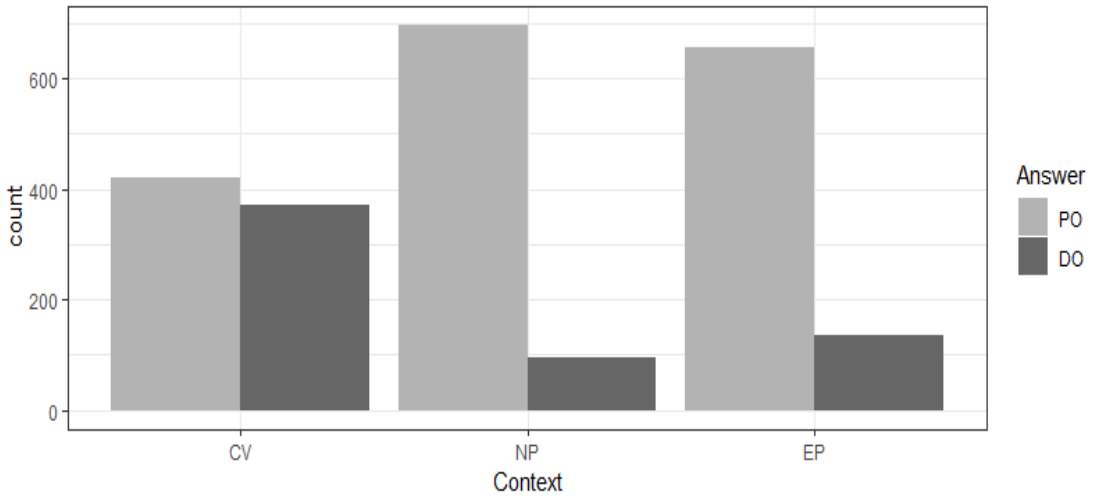



*Figure 10.* Comparison of DO and PO responses against the baseline
*Note:* CV= DO/CVC-prime condition; NP= No Prime/BASELINE; EP= PO/EP-prime condition

In order to answer research question 1 (RQ1) which asked "In which condition (DO/CVC-prime or PO/EP-prime) are significant syntactic priming effects more likely to occur?" it is necessary to determine the statistical significance of the above presented figures in the DO/CVC and in the PO/EP conditions against the baseline. This analysis was done using mixed logit models. As explained in section 6.4 above, I used the generalized linear-mixed model fit by maximum likelihood (Laplace Approximation) to carry out the analysis of the categorical data from multiple perspectives.

Table 8 provides a summary of the analysis with BASELINE, PO/EP-prime, and DO/CVC-prime as fixed effects, in three different combinations (contexts), always using participants as random factors. This analysis did not include target verbs as fixed factors in order to prevent interference from verbs bias in the significance of the effects. A separate analysis will be presented afterwards, using target verbs as fixed factors for comparison purposes:

Table 8
*Summary of fixed effects without verbs*

| Description | Predictor | Coefficient | Standard Error (SE) | *z-value* | *p-value* |
|---|---|---|---|---|---|
| Context 1: Effects of BASELINE and PO/EP-prime | Intercept<br>BASELINE<br>PO/EP-prime | -0.1678<br>-2.2481<br>-1.7933 | 0.2076<br>0.1465<br>0.1343 | -0.808<br>-15.342<br>-13.356 | =.419<br><.001<br><.001 |
| Context 2: Effects of DO/CVC-prime and BASELINE | Intercept<br>DO/CVC-prime<br>BASELINE | -2.4159<br>2.2481<br>0.4548 | 0.2278<br>0.1465<br>0.1533 | -10.604<br>15.342<br>2.967 | <.001<br><.001<br>=.01 |
| Context 3: Effects of DO/CVC-prime and PO/EP-prime | Intercept<br>DO/CVC-prime<br>PO/EP-prime | -1.5150<br>1.5897<br>0.5465 | 0.2021<br>0.1036<br>0.1013 | -7.497<br>15.342<br>5.395 | <.001<br><.001<br><.01 |

*Note:* Negative coefficients show a bias towards the PO in the intercept between conditions. Negative values in the z-value column indicate PO responses in the condition. Positive values refer to the DO.

The high levels of statistical significance (or simply, significance levels, represented as *p*) of the PO responses (<.001) in the BASELINE and in PO/EP-prime in Table 8: *Context 1* confirm the picture anticipated in Table 7 and in Figure 10: participants are strongly biased towards the PO structure. Consequently, the intercept value is statistically insignificant (*p* =.419). In other words, the PO/EP-prime condition does not produce any priming effects.

In the opposite direction, the DO/CVC-prime produces a strong effect in relation to the BASELINE (*p*=.001) as shown in *Context 2*. Likewise, when the DO/CVC-prime and PO/EP-prime are used as fixed factors (Context 3), the DO/CVC-prime has a stronger significance level (*p*=.001) than the PO/EP-prime (*p*=.01) for answers in DO. This shows that the DO/CVC-prime condition triggered more DO answers than did the PO/EP-prime condition. Furthermore, even when the primes were in PO, the DO answers reached an unexpected significant level (*p* <01). I attribute this to a failure in counterbalancing the experimental sessions during the implementation of the tasks, which had more participants start with the DO relative to the PO. Finally, the high significance level of the intercept (*p*=.001) between the DO/CVC-prime and the BASELINE, denotes that the introduction of the DO/CVC-prime results in a highly significant priming effect.

Nevertheless, the above reported results contradict hypothesis 1 (H1), which predicted that significant syntactic priming effects would occur in the PO/EP-prime condition, but not in the DO/CVC-prime condition. The results showed the exact opposite pattern, with significant syntactic priming effects for DO/CVC only. H1 was raised under the argument that the L1CVC is the dominant language in oral production concerning daily language use. Since the PDT is an oral-based task, it was expected that participants would be more inclined to using the DO structure facilitated by the L1CVC. Hence, according to the predictions laid down in the literature regarding the inverse preference effect (Pickering & Ferreira, 2008) and

the surprisal-sensitive persistence (Jaeger & Snider, 2007), the less preferred structure would yield stronger priming effects. In this case, the PO structure should lead to stronger priming effects, according to H1. Surprisingly, however, the baseline conspicuously upsets this expectation by showing that the less preferred structure among the Cape Verdean-Portuguese bilingual participants tested is, in fact, the DO.

There are two possible explanations for this occurrence, both of which are connected with the Cape Verdean sociolinguistic and educational context described in Chapter II. Firstly, despite being the mother tongue in Cape Verde, the L1CVC has an underprivileged linguistic status in comparison to the L2EP regarding to usage in formal contexts. As mentioned before, L1CVC is traditionally an oral language, used primarily in informal everyday interactions, whereas EP is the language of obligatory use in formal contexts such as public ceremonies, media, business, and international affairs. This situation, associated to the fact that L2EP is the language of formal instruction (which means that Cape Verdeans learn to read and to write through the standard L2EP writing system) may have led the participants in the present study to rely more on its PO structure to the detriment of the DO structure prompted by the L1CVC when describing the events in the dative pictures presented to them. The second explanation pertains to the fact that the stimulus sentences and target verbs were presented in written form. This situation might have influenced the activation of the L2EP which, for being the language of instruction in Cape Verdean schools, is most commonly associated with writing. In future studies it would be interesting if the stimuli were presented orally, so that participants would listen to them instead of read them.

In any case, the fact was that L1CVC is the less preferred structure and, as so, it is the language that yields stronger syntactic priming effects, corroborating the predictions of the inverse preference effect (Pickering & Ferreira, 2008) and the surprisal-sensitive persistence

(Jaeger & Snider, 2007). This finding, however, raises pedagogical implications for EFL teaching in the Cape Verdean educational context, concerning the role of previously learned languages in the learning of a third language, particularly the role of the L1. Even though L2EP seems to be the main candidate for transfer into L3 English – which supports the prediction of the L2 Status Factor proposed by Bardel and Falk (2007) discussed in Chapter IV –, the L1 CVC seems to play an important role to mediate processing strategies in the L3 English at the implicit level – at least as far the dative structures are concerned –, as suggested by the results of the present study involving syntactic priming experiments in production. These implications will be discussed in more detail in Chapter IX.

I will now move on to research question 2 (RQ2), which asked: "Will the structure bias of the target verbs presented with the pictures significantly modulate priming effects in each condition?" To answer this question, a separate data analysis was necessary, again using the linear-mixed model fit by maximum likelihood (Laplace Approximation) with the difference that, this time, the target verbs were used as fixed factors. Once more, participants were included as random factors. Table 9 provides a summary of the analysis.

Table 9
*Summary of fixed effects with target verbs in the DO/CVC-prime condition*

| Description | Predictor | Coefficient | Standard Error (SE) | *z*-value | *p*-value |
|---|---|---|---|---|---|
| Context 4: Effects of target verbs as fixed factors | Intercept | -3.38109 | 0.30565 | -11.247 | =.212 |
| | Bring | 0.08536 | 0.23765 | 0.357 | = .719442 |
| | Build | 0.19593 | 0.26289 | 0.745 | =.456101 |
| | Give | 2.09786 | 0.21104 | 9.941 | <.001 |
| | Make | -0.86767 | 0.26162 | -3.317 | <.001 |
| | Offer | 0.08537 | 0.23766 | 0.359 | = .719443 |
| | Pass | -0.43307 | 0.35789 | -1.210 | =.226249 |
| | Read | -0.23964 | 0.34848 | -0.688 | =.491648 |
| | Return | -2.98389 | 0.47830 | -6.239 | <.001 |
| | Sell | -0.33480 | 0.35296 | -0.949 | =.342860 |
| | Show | 1.46401 | 0.30592 | 4.786 | <.001 |

*Note:* Negative coefficients show a bias towards the PO in the intercept between conditions. Negative values in the z-value column indicate PO responses in the condition. Positive values refer to the DO.

A first look at the *p*-value column shows an increase of the significance level of the *Intercept* (from *p*=.001 to *p*=.212) relative to what was shown in Table 8, *Context 2* in the analysis without verbs as fixed factors. What this means is that the target verb bias did not determine the syntactic priming effects observed in Condition 1, as they did not significantly influence participants' choices between the PO and the DO. Therefore, the structure bias of the target verbs cannot explain the results in the DO/CVC-prime condition. In this sense, the prediction of hypothesis 2 (H2) that "The structure bias of the target verbs will not significantly modulate priming effects" is confirmed.

Despite their powerlessness to influence the overall results, when considered in isolation it is interesting to note that some verbs *did* yield statistically significant effects (*p*= .001) in terms of the extent to which they were associated to one of the dative structures at hand. For instance, verbs like *give* and *show* were predominantly used with the DO structure, while verbs like *return* and *make* were assigned to the PO structure. This fact is illustrated in Figure 11 below, referring to the predicted probabilities for answer:

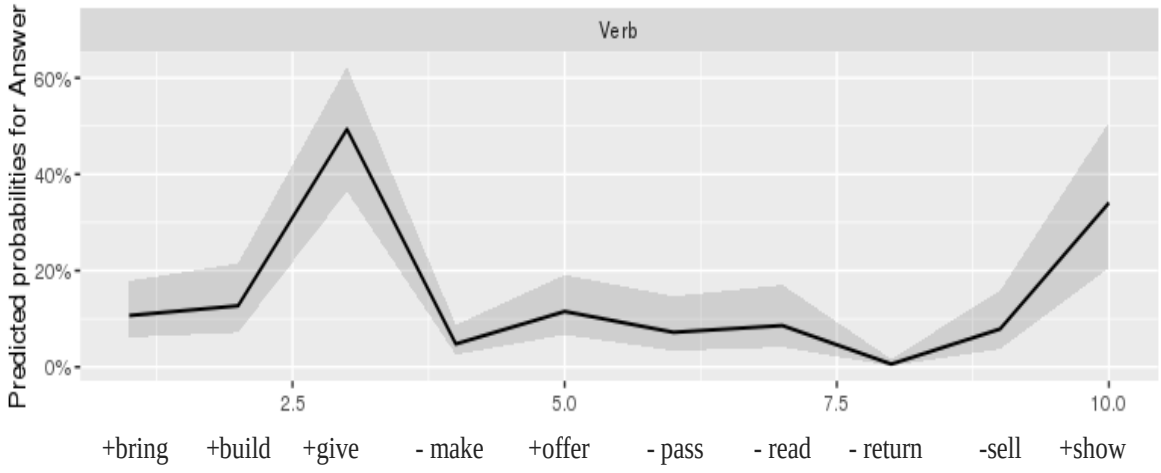



*Figure 11.* Predicted probabilities for answer in the DO/CVC-prime condition
*Note:* the plus signal (+) indicates DO bias. The minus signal (-) indicates PO bias

The events in Figure 11 suggest that, in opposition to the argument used to sustain H2 above, at their intermediate English proficiency level, the participants of the present study have *in fact* developed a fair degree of intuitiveness that allows them to use some dative verbs that have a structure bias towards one or another dative structure in a pattern that resembles that of the native speakers, assigning certain verbs to their respective structure bias that are predicted in the relevant literature (Bernolet & Hartsuiker, 2010; Bock, 1989; Bock & Griffin, 2000; Kutta et al, 2017; Malchukov et al, 2007; Rappaport Hovav & Levin, 2008). Verbs like *pass, return, and sell,* which are more frequent with the PO construction, are used accordingly (Rappaport Hovav & Levin, 2008). However this use is not consistent, considering that verbs like *bring* and *build* which occur more often with the DO construction were preferentially used with the PO construction. Therefore, it is possible to say that, despite a certain degree of intuitiveness in relation to a standard use of dative verbs, participants are still at their interlanguage (see Selinker, 1972; Tarone, 2010) level concerning the issue of dative verbs. In other words, they are still in the process of acquiring what McDonough and Trofimovich (2009) call the "developmentally advanced structure" (p. 109) associated to each dative verb in the target language.

I will now undertake the interpretation of the data in response to research question 3 (RQ3): "What do the results of the picture description task suggest about the linguistic representations of each language pairing tested? What do they suggest about the implicit learning account vs. residual activation account?" Regarding the first question, the results of the picture description task revealed the existence of cross-linguistic syntactic priming in the DO/CVC-prime condition, but not in the PO/EP-prime condition. Priming effects were statistically significant only from L1 CVC to L3 English with respect to double-objects. POs from L2 EP did not prime the production of POs in L3 English. This has been explained by

the fact that the participants had a PO structure preference prior to engaging in the experiments, as demonstrated in the baseline, but then consistently switched their responses to the DO after being exposed to the DO/CVC-prime condition.

The results are partially in line with the prediction of the inverse preference effect (Pickering & Ferreira, 2008) as well as of the surprisal-sensitive persistence (Jaeger & Snider, 2007) which advocate for a *stronger* syntactic priming effect from the less preferred structure. The term "stronger" entails that effects are *also* found for the structure of greater preference. Thus, the occurrence of syntactic priming effects between languages that share a similar structure, irrespective of the magnitude of the effect, is at the heart of the shared-syntax account. In this sense, with respect to the DO/CVC-prime condition, the results are in line with the existing cross-linguistic syntactic priming studies supporting the shared-syntax account and the idea that "common structures from a bilingual's known languages may have a common psycholinguistic substrate, so that structurally similar forms are created in procedurally similar ways" (Loebell & Bock, 2003, p. 796).

On the other hand, since there was no syntactic priming effect at all from the preferred structure (the PO), the results of the PO/EP-prime condition seems to violate the prediction laid down in the shared-syntax account. This does not mean, however, that the results of the PO/EP-prime condition support the separate-syntax account suggested in modular (yet interacting) language processing models such as Ullman's (2001) DP model and De Bot's (1992) Bilingual Production Model discussed previously in the review of literature. The findings in the current cross-linguistic syntactic priming literature converge in the view that there is, by and large, more evidence for shared-syntax than against it (McDonough & Trofimovich, 2009), and some researchers go even further as to state that "all studies on syntactic priming across languages provide evidence for shared syntactic representations

between languages" (p. 133). That said, one possible reason for the absence of syntactic priming effects in the PO/EP-prime condition might be related to methodological anomalies in counterbalancing that might have hindered the occurrence of priming effects for this particular condition.

In relation to the implicit learning vs. residual activation account, the results of the present study are more consistent with the former. This is because the design of the experiment did not include prime-target pairs with the same lexical items, particularly verbs. As in Loebell and Bock (2003), care was taken in the design of the experiment so that the pictured events would be "unlikely to elicit the same content words as the priming sentences" (p. 797). In this way, there was no possibility of the pictures being described in a semantically or narratively equivalent form as the prime sentence.

In addition to that, the design of the experiment took into account the issue of verb structure bias and their likelihood to influence the choice between the DO and PO construction in the different phases of the experiment (BASELINE; DO/CVC-prime; PO/EP-prime). The target verbs placed underneath the pictured events were carefully selected considering their different structural preferences indicated in the relevant literature. The analysis carried out through the Generalized Linear Mixed Model fit by maximum likelihood (Laplace Approximation) has shown in Table 9: *Context 4* that the target verb structure bias did not reach a sufficient level of statistical significance to interfere in the syntactic priming effects found in the present study. If anything, the effects might be related to the non-alternating dative prime verbs from the L1CVC, which only allow the DO. Non-alternating prime verbs have been shown to trigger strong syntactic priming effects within languages (e.g. Melinger & Dobel) as well as across languages (e.g. Salamoura & Williams).

That said, the occurrence of syntactic priming effects in the DO/CVC-prime condition in the present production study cannot be explained in terms of the lexicalist residual activation account. Rather, the implicit learning account (Chang et al., 2006) seems to offer a better rationale for the findings in the sense that the only feature shared by the prime sentence and the pictured event was related to the structure (word-order), which has been regarded as an essential aspect to determine cross-linguistic syntactic priming (see Bernolet et al, 2007; Loebell & Bock, 2003). The effect of the non-alternating prime verb in this process is explained by the implicit learning account in the sense that "the model keeps track of the different verb–structure combinations it encounters and bases its structural predictions on error-based learning" (Bernolet & Hartsuiker, 2010, p. 460). In other words, the implicit learning account posits that when the parser encounters an unexpected verb-structure combination it is forced to reanalyze its initial prediction, leading to an "error-based learning" which, by its turn, triggers stronger priming effects than if the verb-structure combination was already expected. In the context of the present study, the DO structure from the L1CVC constitutes the unexpected structure, as shown in the unprimed (baseline) condition.

In sum, the results of the present study show that although source language preference seems to be a predictor of the structure bias in the unprimed condition, it does not determine the choice of the structure to be produced in the primed condition. The syntactic priming paradigm has the power to switch an initial structure bias. Hence, the syntactic priming effects show a significant role of the L1CVC in the processing of L3 English dative constructions. The results of the PO/EP-prime condition, however, were not conclusive regarding a facilitatory effect of the L2 EP into L3 English with respect to the PO construction. The following chapter reports the results of the comprehension study which employed a self-paced word by word reading paradigm.

# CHAPTER VII

# STUDY II: INVESTIGATING CROSS-LINGUISTIC SYNTACTIC PRIMING IN COMPREHENSION

The present chapter reports the findings of Study II on cross-linguistic syntactic priming in the modality of comprehension. The study was conducted with the same participants that performed Study I, described in the previous chapter concerning the production modality. The aim of the present study is to find out whether syntactic priming occurs, in the comprehension modality, between L1 CVC and L3 English for the DO construction, and between L2 and L3 English for the PO construction. If so, the strength of the effects in each condition and the implications for the residual activation versus implicit learning accounts, as well as for the dichotomy of shared or separate syntax in bilinguals are investigated.

The opening section (7.1) dissects the general research question guiding the dissertation (see Chapter V, section 5.1) into specific research questions, followed by the hypotheses to be tested experimentally in the self-paced reading task (SPRT). Section 7.2 describes the participants' backgrounds and the setting for the implementation of the present study. In section 7.3 and subsections, the materials and procedure that guided the experiments are described in detail. After that, section 7.4 and subsections describe the data pre-processing procedure and then introduce the statistical test used for carrying out the data analysis in each condition. Finally, section 7.5 discusses the findings of Study II concerning the role of L1 CVC and of L2 EP as previously learned languages in the processing of L3 English in the Cape Verdean context, the implications for the shared vs. separate syntax and the residual vs. implicit learning accounts, and the contributions for the existing theoretical background on cross-linguistic syntactic priming in the modality of comprehension.

## 7.1 RESEARCH QUESTIONS AND HYPOTHESES

Studies using the syntactic priming paradigm in the modality of comprehension to investigate the role of previously learned languages in the processing of a target language have been extremely scarce. Study II attempts to fill in this gap in the syntactic priming literature by introducing three languages in two conditions that involve the dative alternation (DO and PO) to investigate whether syntactic priming occurs for the language pairings tested and, if so, the strength and the implications for the existing theories in the field. In order to achieve these ends, the following research questions were posed, attending to the general research question presented in Chapter V, section 5.1:

RQ1: Which condition (DO/CVC-prime or PO/EP-prime) is more likely to generate significant syntactic priming effects reflected in the decrease of reading times in the target language?

RQ2: Will syntactic priming effects be boosted by the use of a double prime sentence (PP-T) in each condition?

RQ3: Will syntactic priming effects be modulated by the structure bias of the target verbs?

RQ4: What do the results of the self-paced reading task suggest about the shared-syntax vs. separate syntax account and about the residual activation vs. implicit learning account?

To attempt to answer the research questions, the following hypotheses were proposed, attending to the relevant literature on cross-linguistic syntactic priming in comprehension:

H1: Significant syntactic priming effects are more likely to occur in the DO/CVC-prime condition than in the PO/EP-prime condition.

According to the prediction of the inverse preference effect (Pickering & Ferreira, 2008) as well as of the surprisal-sensitive persistence (Jaeger & Snider, 2007), the less preferred structure is expected to generate stronger priming effects. Since participants are expected to have greater preference for the PO structure prompted by the L2 EP for being the dominant language with respect to reading in daily language use, the DO structure prompted by the L1 CVC is expected to generate stronger priming effects.

H2: The use of double prime sentences will boost the syntactic priming effects in each condition.

The doubling of the prime sentence was introduced in the field research as an adjustment to the design of the SPRT experiment carried out in the pilot study which produced no priming effect. Syntactic priming effects in comprehension have been either associated to lexical repetition (in the case of cross-linguistic priming experiments, on translation equivalents) (e.g. Ledoux et al. 2007; Weber & Indefrey, 2009) or to word order overlap (e.g. Kidd et al., 2015). In the latter case, the doubling of the prime stimulus has been shown to boost the effects (Pickering & Branigan, 1998; Thothatiri & Snedeker, 2008). H2 is based on this prediction. It is expected that priming effects happen independently of lexical repetition and that the use of the double primes modulate the priming effects in each condition.

H3: The syntactic priming effects will not be modulated by the structure bias of the target verbs.

An accurate prediction of the verb structure bias entails a high level of intuitiveness regarding the use the dative verbs in context. Given participants' intermediate English proficiency levels (B1/B2) as well as the automaticity of responses that the self-paced reading task requires at the onset of the stimulus on the monitor screen, it is expected that participants

perceptions of target verb bias will not consistently resemble the pattern exhibited among native speakers of English (see Bock, 1989; Bock & Griffin, 2000; Kutta et al., 2017).

H4: The results of the self-paced reading task will provide support for the shared syntax account and for the implicit learning account.

In the case of the occurrence of syntactic priming effects in either of the between-language conditions tested, such effects can only provide support for the shared-syntax account as shown in the cross-linguistic syntatcic priming literature (Felício, 2018; Hsieh, 2016; Kidd et al., 2015; Weber & Indefrey, 2009). In the case of absence of syntactic priming effects, it may be due to methodological limitations (failure of the experimental design or of the statistical test to detect priming effects) or to other factors that might have escaped the control of the researcher. Lack of evidence of priming effects, however, will not be attributed to the separate-syntax account, since evidence in favor of the shared-syntax account is now sufficiently robust to settle the issue (De Jesus & Mota, 2017; McDonough & Trofimovich, 2009).

Regarding the implicit learning vs. residual activation dichotomy, it is worth reminding that the design of the experiment did not include translation equivalents between prime and target sentences. Therefore, any priming effects detected will be explained by way of the implicit learning account in favor of a structural source of priming between the paired languages (Bernolet & Hartsuiker, 2010; Loebell & Bock, 2003).

## 7.2 PARTICIPANTS AND SETTING

Study II counted with the participation of the same Cape Verdean-Portuguese bilingual students from Study I and was carried out in the same setting.

## 7.3 MATERIALS AND PROCEDURE

The experiments that make up Study II were designed and implemented with version 1.81.01 of *PsychoPy* launched in October 2014 (the latest version at the time the experiments were carried out) (Peirce, 2007). The conditions tested were the DO/CVC-prime and the PO/EP-prime. There was a minimum of one-week interval between them. Each condition had a list with 24 prime-target sentence pairs, 90 filler sentences (45 in each of the two languages language in each condition) and six double primes.

It is important to restate that all sentences in the three languages involved were submitted to grammaticality acceptability judgements by native speakers. They were rated with a Likert Scale ranging from 5 ("highly acceptable") to 1 ("completely unacceptable"). The experiment counted only with those sentences rated as "highly acceptable" or "acceptable". The dative verbs that were used to create the target sentences were selected from lists used in previous syntactic priming studies which had used dative constructions such as Arai et al. (2007)'s Appendix A, Loebell and Bock's (2003) Appendix B, and Pickering and Branigan's (1998) APPENDIX. These verbs have been shown to support DO and PO constructions to a similar degree. The prime dative verbs used in the L1CVC and in the L2EP were translation equivalents of the English target dative verbs, but they were never used to build prime-target pairs. The filler sentences portrayed semantically unrelated events by means of alternative constructions such as intransitives, reflexives, locatives, or expletives.

### 7.3.1 The baseline

It was not possible to have a No-prime condition as done in previous cross-linguistic syntactic priming studies (e.g. Felício, 2018; Hsieh, 2016; Kidd et al. 2015; Weber & Indefrey, 2009) because the alternative dative structure is not available in the source languages. While this fact may be regarded as a limitation in the experiment in comparison to

the previous studies, it can also be interpreted as a strength, since the non-alternating dative verb from the prime has been shown to increase the likelihood of the reuse of its syntactic structure with the alternating target verb (Melinger & Dobel, 2005). It is also worth mentioning that, no previous crosslinguistic syntactic priming studies had used dative structures in the comprehension modality. Instead, structures such as intransitives (actives vs. passives) (e.g. Felício, 2018; Weber & Indefrey, 2009) or relative clause attachments (e.g. Kidd et al., 2015; Hsieh, 2016) have been privileged. The results of these studies have been confounding with regards to whether the priming effects observed were facilitated by lexical repetition or by abstract syntactic representations.

Likewise, the results of the very few monolingual studies in comprehension have also been inconclusive with respect to the source of priming effects (see Arai et al., 2007; cf. Thothathiri & Snedeker, 2008). According to Hsieh (2016), "while priming results of some structures (e.g., reduced relatives) suggest that comprehension priming might be determined by lexical repetition, results for other kinds of sentences (e.g., those containing dative or prepositional structures) are mixed" (p. 6). Hence, the present study may help to shed a light to the current debate regarding the source of cross-linguistic syntactic priming effects in the modality of comprehension, at least as far as the dative structures are concerned.

In order to have a point of reference regarding participants' structure bias in the target language, the study took advantage of the information obtained in the baseline phase carried out by means of a picture elicitation task that allowed participants to engage in free production of dative structures in English prior to submitting them to the prime stimuli. This information is crucial for the interpretation of the results of the experiments concerning the significance of the priming effects in accord with the prediction of the inverse preference effect (Pickering & Ferreira, 2008).

### 7.3.2 The Primed Conditions

The design of the self-paced reading task (SPRT) was based to a certain extent on Weber and Indefrey (2009). The task tested two conditions: 1) DO/CVC-prime condition (L1 CVC – L3 English); and 2) PO/EP-prime condition (L2 EP - L3English). Condition 1 counted with the collaboration of all 36 participants. Condition 2 counted with 34, since two participants did not complete the task due to tiredness. Each condition was implemented in different days (with a week in between) at the participants' convenience in order to minimize tiredness and avoid guessing and other undesired factors. The experiments were counterbalanced in each session, so that session 1 had half of the participants performing condition 1 and the other half performing condition 2. In session 2 the procedure was inverted.

The experiments were carried in a classroom provided by the English Coordination for the effect. The room was quiet and tidy, offering optimal conditions for the implementation of the experiment. Each participant sat on a comfortable chair in front of a computer placed about 50 centimeters from his/her eyes and leveled on a desk to his/her height. The stimuli consisted of sentences presented on a word-by-word self-paced reading paradigm at the center of the screen of an ASUS 16-inch widescreen monitor, with white Arial font, size 30 on a grey background. In the self-paced reading paradigm, words on the screen are activated by the participant's button presses (the spacebar), causing them to appear and disappear from the screen. This is done in order to prevent participants from vizualizing the full sentence and predict its structure. However, in order to correct a caveat identified in the pilot, each word would remain on the screen for a maximum of 3 seconds. This was done to speed the rate at which each word could be vizualized and, in this way, prevent participants from having time to reflect on the language and make guessings on what was actually being investigated.

The reading time of each word was recorded by the software *PsychoPy*. The time spent on each word depended on how fast the participant pressed the button, but it could never exceed 3 seconds. The reading time of the critical word, i.e., the first post-verbal object (the indirect object in DO construction; the direct object in the PO construction) was of particular importance because it signals the moment on parsing when the syntactic structure of the sentence becomes apparent (see Weber & Indefrey, 2009). This is a determining factor for the comparison of the time spent on the reading of the ROI of the prime and target sentences in each language pairing.

Each condition (DO and PO) had its own list made up of a total of 24 prime-target pairs. A double prime-sentence preceded six prime-target pairs, starting at the second pair and proceeding after every four pairs down the list. The prime-target sentence region was, thus, formed by the double prime-sentence, and the prime-target sentence (PP-T). The region was surrounded by three to five fillers, forming a set of six to eight sentences at every line on the list, creating a pseudo-random effect. A fixation cross ("+") was displayed between each sentence to signal the end of a sentence and the beginning of another. At this point, the participant could pause for processing purposes before pressing the spacebar again for the next sentence.

The experiment used the guise of a memory task in order to prevent participants from paying attention to language. Participants were told that the goal of the experiment was to test how accurately they could remember the sentences they read in both languages. The comprehension questions were used for this purpose. Hence, after the last sentence in the set, a comprehension question (e.g. Did Kathy offer Philip a pencil?) appeared, after which the participant had to press the "YES" or "NO" button branded with green and red colors on the "ctrl" keys on each side of the spacebar. In reality, the comprehension question was included

as a way of ensuring that participants were paying attention to the task at hand and were processing the stimuli. A high number of incorrect answers would be regarded as an indicator of participants' distraction during the task and, hence, force the researcher to throw away the data.

After answering the comprehension question ("YES" or "NO"), the participant pressed the spacebar again and the fixation cross ("+") appeared to indicate the end of the set. The next set would start with a new pressing of the spacebar and the same procedure was repeated until all the sentences in every set had been read. The experiment ended with the display of a "THANK YOU" note on the screen. A trial phase preceded the whole experiment so that participants could become familiar with the task procedure for as long as necessary.

## 7.4 DATA ANALYSIS

Prior to analyzing the syntactic priming data, *per se*, it was necessary to verify the accuracy rate of participants' responses to the twenty-four comprehension questions posed in the course of the experiment as a way to check whether participants were attending to and processing the stimuli. Equally important was to check the data for impossible reading time values (below 150 ms) and outliers in order to clean the data for the analysis. The following section will explain this process.

### 7.4.1 Data pre-processing

In order to separate the amount of data to be removed from those that would be included in the final analysis, the data obtained from each participant in each experimental condition were checked for accuracy on comprehension questions and for reading times. Regarding accuracy on comprehension questions, the number of correct answers given by each participant was caculated from the total of twenty-four questions in each prime condition. Then, the means and standard deviations were calculated. The values obtained

would determine the criterion for removing the data. The PO/EP-prime condition had a slightly higher accuracy rate than the DO/CVC-prime condition (DO/CVC-prime: *M*=21.2, *SD*= 1; PO/EP-prime: *M*=21.4, *SD*= 1). The criterion for removing the data was then set as follows: all participants who scored two standard deviations away from the mean number of correct answers will be removed. This criterion did not lead to the exclusion of any participant.

With respect to reading times, the data was first checked for the existence of impossible reading times and all values below 150 ms were removed. After that, the means and standard deviations of each word of every sentence within the prime-target region (PP-T) were calculated for each condition. Finally, the values outside of the range of the standard deviation mean obtained in each condition (DO/CVC-prime: Mean±0.18SD; PO/EP-prime: Mean±0.22SD) were treated as outliers and discarded. The percentage of missing data for reading times was 4.1% in the DO/CVC-prime condition and 9.8% in the PO/EP-prime condition. These figures are considered normal (Ratcliff, 1993). Therefore, no participant was excluded as a result of the reading times screening procedure and the data of the 36 participants of the DO/CVC-prime condition and 34 of the PO/EP-prime condition was submitted to statistical analyses.

### 7.4.2 Analysis of the SPRT data

As done in Study I, I opted for the mixed logit models (instead of ANOVA) using the statistics software package R to analyze the syntactic priming data of Study II. Again, I followed the recommendations in Jaeger (2008) which points to a number of advantages of the mixed logit models over other statistical tests. For example, mixed logit models dispense with the need for homogeneity of variances due to their greater power to detect true effects. It is also better equipped to cope with missing values, compensating for potential discrepancies

they may originate in the analysis. This is very important, considering that the screening procedure of the SPRT led to missing data in the order of 4 to 10%.

Another advantage of the mixed logit models is that they allow the insertion of isolated variables (within the condition) as predictors to verify the strength of each of these variables in the results of the condition as a whole. This feature permits the testing of the effect of random factors (e.g. participants) in the analysis to compare the results of the analysis with and without the random factors. This is important to verify the impact of the random factors on the effects of the fixed factors and, in this way, decide whether the inclusion of the random factors in the analysis is necessary or not. Other statistical models (e.g. ANOVA) lack this mechanism and, therefore, a potential random factor is obligatory in the analysis which, according to Jaeger (2008) may lead to spurious effects.

However, among the very few comprehension studies which have been developed in the cross-linguistic syntactic priming literature, to the best of our knowledge, to date, only one (e.g. Kidd et al., 2015) has employed the mixed logit models to analyze the data. Most comprehension studies have privileged the use of alternative models, such as ANOVAs (e.g. Hsieh, 2016; Weber & Indefrey, 2009) or paired-samples t-tests (e.g. Felício, 2018). The present study is, hence, only the second cross-linguistic syntactic priming study to use the mixed logit models with comprehension data. This decision is based on the advantages that mixed logit models present in comparison to alternative models, namely in terms of power to detect priming effects, as mentioned before.

I used the Linear Mixed Model fit by REML t-tests which use Satterthwaite approximations to degrees of freedom calculated with the *lmerMod* package (Ludecke, 2017) in R (version 2.4.0 available at: https://CRAN.R-project.org/package=sjPlot). In each condition, when necessary, the analysis was based on: 1) *Condition* and *ROI* (e.g. "Word 3"

and “Word 4”) as fixed factors; and 2) with and without the double primes (“PP-T”, “P-T”); and 3) with target verbs as fixed factors. The presentation of results of (2) and (3) will depend on priming effects being found in (1) for each condition. *Participant* was always used as a random factor. The following section will illustrate these points.

## 7.5 RESULTS AND DISCUSSION

Before presenting the results, it is important to remind that, due to the absence of the dative alternation in the source languages in each condition (the L1 CVC only allows the DO while the EP only allows the PO), it was not possible to have a No-prime condition based on reading time. Therefore, the same baseline used in Study I (the baseline that was based on a picture elicitation task and that had shown that participants had a structure bias for the PO construction in the target language) was also taken as the reference point for Study II.

Moreover, since the two experimental conditions were implemented separately as a way to prevent interference from competing structures in the results, the priming effects will also be analyzed separately, on a within-condition basis. After that, the syntactic priming effects (if any) found in each condition will be compared as a way to answer research question 1 (RQ1). The results will then be interpreted in terms of how they inform the shared vs. separate syntax account – based on whether processing time from prime to target decreases significantly or not in each of the conditions, showing the extent of the interaction between the two linguistic representations – and the residual activation vs. implicit learning accounts – regarding the possible source of the syntactic priming effects found (if any).

I will now tackle RQ1 which asked, “Which condition (DO/CVC-prime or PO/EP-prime) is more likely to generate significant syntactic priming effects reflected in the decrease of reading times of the target language?” I will start by presenting the results of Condition 1: DO/CVC-prime. Figure 12 shows the mean reading times for the L1CVC-L3 English pairing:

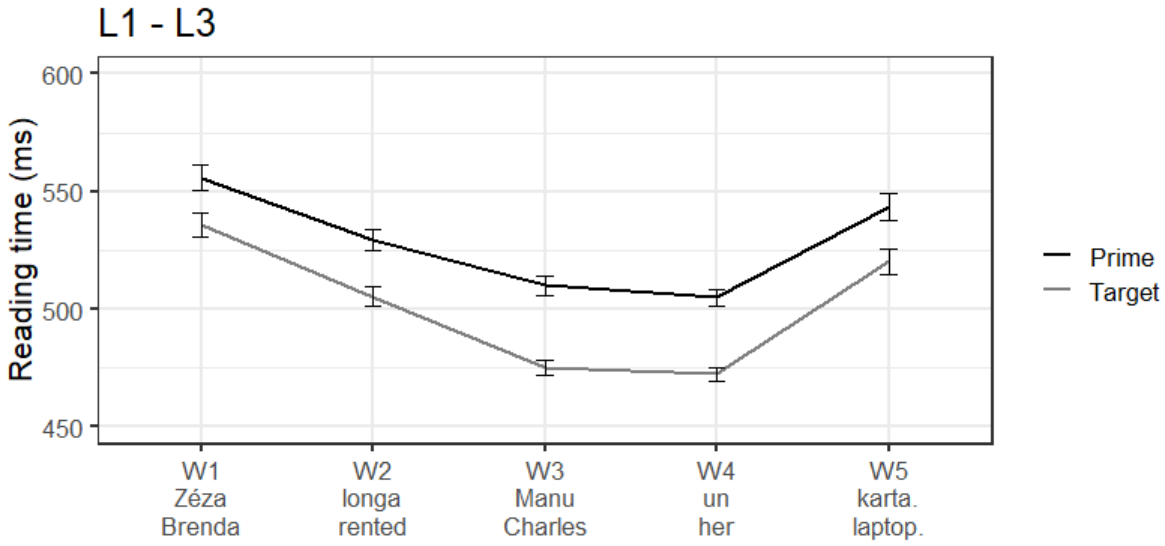



*Figure 12.* Mean reading times for Condition 1 (DO/CVC-prime).
Error bars denote standard errors around the mean.

The means presented in Figure 12 show a steady decrease in reading times from prime to target across the whole sentence. Unsurprisingly, words 3 and 4, which belong to the critical region or region of interest (ROI), are processed faster from prime (word 3: *M*= 510 ms, *SD*=0.1; word 4: *M*= 505 ms, *SD*=0.1) to target (word 3: *M*=475 ms, *SD*=0.1; word 4: *M*= 472 ms, *SD*=0.1), denoting apparent priming effects (to be confirmed with the statistiscal tests). This accentuated decrease of reading times is explained by the fact that this is the region where the disambiguation of the target structure occurs. The first postverbal NP (word 3) in the target sentence is read faster by influence of the expectation generated by the reading of the prime sentence which had prompted the full structure. Word 4 seems to benefit from the acceleration of the reading time occurred in word 3. The pattern observed in the ROI is, hence, compatible with the findings of previous cross-linguistic syntactic priming studies in the comprehension modality (e.g. Weber & Indefrey, 2009; Kidd et al., 2015; Hsieh, 2016), despite the fact that none had used dative structures.

On the other hand, it is also possible to observe a reduction in reading time from prime to target outside the ROI, namely in words 1, 2, and 5, which is rather unusual. This can be

explained, however, by the fact that every prime-target pair was designed to match not only in terms of structure, but also in terms of word length (every prime and target word had the exact same number of syllables) and word class, i.e., for every word in the prime sentence, there is a directly related word in the target sentence. Therefore, the pattern observed in Figure 12 seem to support Kidd et al.'s (2015) finding that "crosslinguistic priming has been shown to be strongest in instances of word order overlap" (p. 1066).

It is also possible that the reduced reading times registered outside the ROI were subserved by specific features attributed to dative structures. Since the literature has provided mixed results regarding the source of priming effects in comprehension (Arai et al., 2007; Kidd et al., 2015; Thothathiri & Snedeker, 2008) and considering the inexistence of syntactic priming studies in the comprehension modality involving dative structures, little is known about the extent to which these structures differ from others in influencing priming effects. Hence, the possibility that dative structures modulate priming effects outside the ROI should not be dismissed. Further research should take this aspect into consideration.

The longer reading time in word 5 can be eventually explained by the anticipation of the end of the sentence triggered by the disambiguation of the structure that occurs at the ROI, leading to a deceleration at the final word. This pause, followed by the display of the fixation cross to signal the end of a set and the beginning of a new one, might eventually have caused a delayed reaction at the onset of word 1. This pattern with longer reading times for the first and last words has been recurrent in previous cross-linguistic syntactic priming studies in comprehension which have used the self-paced word-by-word reading paradigm in within and between-language conditions (e.g. Felício, 2018; Weber & Indefrey, 2008, 2009).

The mean reading times presented above were then subimitted to statistical analyses using the Linear Mixed Model fit by REML t-tests through Satterthwaite approximations to

degrees of freedom, calculated with the *lmerMod* package in R. As mentioned before, the analysis included *Condition* and *ROI* ("Word 3" and "Word 4") as fixed factors. *Participant* was used as a random factor. Table 10 provides a summary of fixed effects with the interaction between *Condition* and *ROI* (words 3 and 4):

Table 10
*Summary of fixed effects in Condition 1: DO/CVC-prime, with Condition and ROI*

| Description | Predictor | Coefficient | Standard Error (SE) | Degrees of Freedom (DF) | *t* (36) | *p*-value |
|---|---|---|---|---|---|---|
| Interaction between *Condition* and *ROI* | Intercept | 0.35886 | 0.11793 | 37.00000 | 3.043 | =.01 |
| | Condition | -0.20513 | 0.01594 | 8243.00000 | -12.869 | <.001 |
| | Word 3 | -0.39257 | 0.02525 | 8243.00000 | -15.549 | <.001 |
| | Word 4 | -0.44665 | 0.02512 | 8243.00000 | -17.783 | <.001 |

Table 10 shows that the apparent syntactic effects denoted by the reduction of reading times from prime to target in Figure 12 are in fact highly significant. This is demonstrated by the significance level of the intercept ($p$=.01). As a matter of fact, the condition as a whole accused significant priming effects ($p$ <.001) caused by the processing facilitation at the ROI (words 3 and 4) from prime to target. In the absence of lexical repetition between primes and targets, the syntactic priming effect observed can be attributed either to the overlap in terms of word order or to some sort of facilitation effect promoted by the use of the dative structure. It is worth recalling that the conflicting results of syntactic priming studies in comprehension with monolinguals and bilinguals have been associated to the use of different sentence structures (e.g. Arai et al., 2007; Hsieh, 2016; Kidd et al., 2015; Thothathiri & Snedeker; 2008). Yet, since dative constructions have not been used in cross-linguistic studies (in comprehension), their potential influence on syntactic priming effects remains unclear.

In order to scrutinize the specific weight that each word had on the high significance level of the condition, it is necessary to single out their significance values. In this case, the

words within the ROI are the most important indicators. The significance levels of word 3 and of word 4 are very high (both with $p$ <.001) and, although word 4 was read slightly faster than word 3, the difference between their $p$-values is not statistically significant. This means that they had approximately the same weight on the significance level of the condition, which speaks to their strong contribution for the significant syntactic priming effects registered in the intercept ($p$ =.01). Overall, despite having used a different sentence structure (datives), the results of condition 1 are in line with Kidd et al.'s (2015) findings with relative clauses assigning a vital role to word order to determine syntactic priming effects in comprehension.

Still concerning RQ1, I will proceed with the analysis of Condition 2: PO/EP-prime. Figure 13 presents the mean reading times of all words read in prime and target sentences:

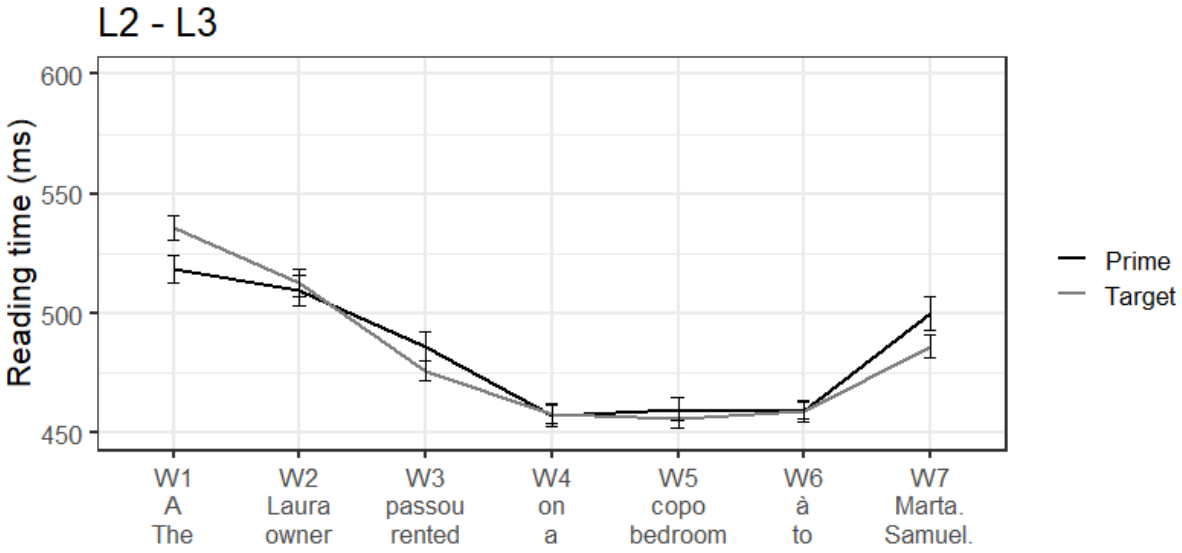



*Figure 13.* Mean reading times for Condition 2 (PO/EP-prime).
*Note:* Error bars denote standard errors around the mean

The pattern exhibited in Figure 13 for Condition 2 above is somewhat reminiscent of the one seen in Figure 12 for the DO/CVC-prime condition with the longer reading times registered at the words positioned at the extremes and the shorter reading times located in the middle, particularly at the ROI. However, it is possible to observe that, differently from the previous condition, the lines representing prime and target sentences in this condition are

noticeably closer, and at some instances they coincide or even intersect. The reading times observed are, hence, concurrent, particularly at the ROI, with very similar registers from prime (word 4: *M*= 458 ms, *SD*=0.1; word 5: *M*= 460 ms, *SD*=0.1; word 6: *M*= 459 ms, *SD*=0.1) to target (word 4: *M*= 458 ms, *SD*=0.1; word 5: *M*= 456 ms, *SD*=0.1; word 6: *M*= 459 ms, *SD*=0.1), anticipating little or no interaction between the two linguistic representations concerning the PO dative structure tested in condition 2 and, hence, an apparent absence of syntactic priming effects. This is to be confirmed through the significance levels provided by the statistical tests.

As done with condition 1, the mean reading times found in condition 2 were submitted to statistical analyses using the Linear Mixed Model fit by REML t-tests through Satterthwaite approximations to degrees of freedom, calculated with the *lmerMod* package in R. Again, the analysis was done using *Condition* and *ROI* ("Word 3", "Word 4", and "Word 5") as fixed factors. As always, *Participant* was used as a random factor. Table 11 provides a summary of fixed effects with the interaction between *Condition* and *ROI*:

Table 11
*Summary of fixed effects in Condition 2: PO/EP-prime, with Condition and ROI*

| Description | Predictor | Coefficient | Standard Error (SE) | Degrees of Freedom | *t* (36) | *p*-value |
|---|---|---|---|---|---|---|
| Interaction between Condition and ROI | Intercept | 2.787e-01 | 1.171e-01 | 3.400e+01 | 2.380 | =.05 |
| | Condition | 4.177e-03 | 1.176e-02 | 1.080e+04 | 0.355 | >.05 |
| | Word 4 | -3.995e-01 | 2.201e-02 | 1.080e+04 | -18.154 | <.05 |
| | Word 5 | -4.035e-01 | 2.198e-02 | 1.080e+04 | -18.358 | <.05 |
| | Word 6 | -4.211e-01 | 2.194e-02 | 1.080e+04 | -19.194 | <.05 |

The absence of syntactic priming effects denoted in Figure 13 is confirmed. Table 11 shows that the intercept value between *Condition* and *ROI* is not significant, though by a marginal level (*p*=.05). Despite the high significance levels of the words in isolation, particularly at the *ROI* (*p* <.05), they were not sufficient to create a significant priming effect

within the condition ($p$ =.05). Hence, it is possible to say that the condition itself did not favor an interaction between the two linguistic representations (EP and English) concerning the PO structure at the implicit level. If we rule out word order, a major factor that, according to the literature, helps to explain the absence of syntactic priming effects in comprehension is the fact that there was no lexical repetition between prime and target sentences (see Arai et al., 2007; Cleland & Pickering, 2003; Felício, 2018; Ledoux, Tooley & Traxler, 2010).

However, in accord with the predictions of the inverse preference effect (Pickering & Ferreira, 2008) and the surprisal-sensitive persistence (Jaeger & Snider, 2007), another factor could also be at play here, which is the issue of participant structure bias. As demonstrated in the baseline, participants already had a strong preference for the PO structure instantiated in the L2EP and, as so, syntactic priming effects involving this particular structure were already expected to be weak or not significant due to established routines in using the PO from the L2EP, particularly in its written form. This is attested by the fact that the mean reading times in the PO/EP-prime condition overall faster than the ones observed in the DO/CVC-prime condition, particularly for the prime sentences. However, since priming effects are determined by the difference between reading times from prime to target, such effects are stronger in the DO/CVC-prime condition, probably due to poor reading routines in the L1CVC, which in turn can be explained its status of less preferred language.

Ultimately, the results obtained through the statistical analysis of the two conditions confirm the prediction of hypothesis 1 (H1) that significant syntactic priming effects are more likely to occur in the DO/CVC-prime condition than in the PO/EP-prime condition.

Next, I shall turn to the analysis of research question 2 (RQ2): "Will syntactic priming effects be boosted by the use of a double prime sentence (PP-T) in each condition?" Since there were no syntactic priming effects in condition 2 (PO/EP-prime), a comparison of the

results of the reading times of the double primes with those of the primes was made only for condition 1 (DO/CVC-prime).

Based on the results of previous syntactic priming studies in comprehension in which the use of double prime stimulus has been shown to boost the effects (Pickering & Branigan, 1998; Thothatiri & Snedeker, 2008), I expected that the answer to the question would be "Yes". As usual, I will start by looking at condition 1, DO/CVC-prime. Once more, the statistical analysis was done with the Linear Mixed Model fit by REML t-tests through Satterthwaite approximations to degrees of freedom, calculated with the *lmerMod* package in R. Since the significance levels of the intercept between the fixed factors (*Condition* and *Variable*) have already been presented in Table 10 showing significant priming effects, only the graphic (boxplots) will be presented now, with the significance levels of the double primes attached. Figure 14 parallels the reading times *without* the double primes (labeled as "No extra prime") against the reading times *with* the double primes (labeled as "Extra prime"):

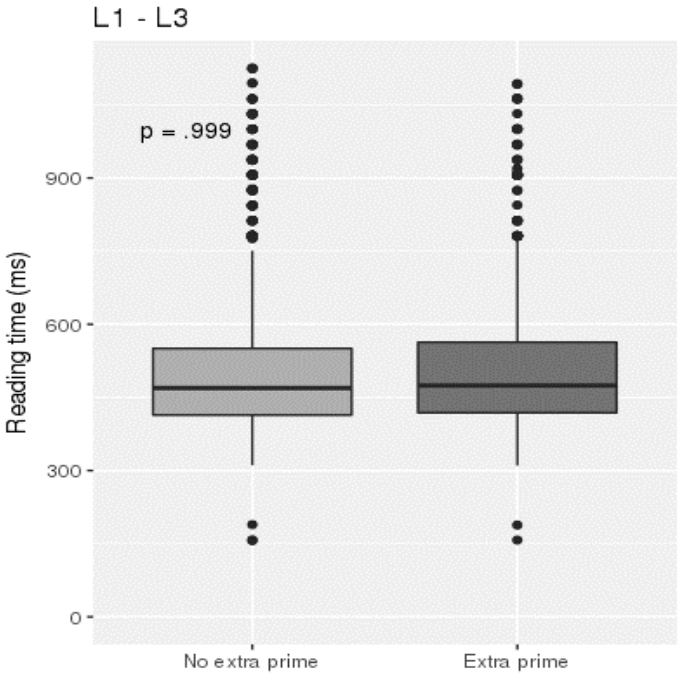



*Figure 14.* Comparison of mean reading times with and without double primes in Condition 1 (DO/CVC-prime)

The boxplots in Figure 14 show no significant difference of reading time means in the DO/CVC-prime condition when the double primes are present as compared to when they are not ($p$>.05). This means that the double primes did not contribute to accelerating reading times from prime to target sentences. Hence, the use of the double primes did not have a statistically significant influence on the syntactic priming effects reported in Table 10. This finding contradicts hypothesis 2 (H2) that predicted a positive effect of the double primes on the syntactic priming effects found in condition 1.

On the other hand, the exclusion of double primes as a potential factor reinforces the possibility of word order overlap being the major factor behind the syntactic priming effects observed. Word order overlap is not a trivial issue as it has been suggested as the main factor supporting the syntactic priming effects in Kidd el al.'s (2015) comprehension study, whereas the lack of it has been presented as the best explanation for the absence of syntactic priming effects in Loebell & Bock's (2003) production study. Hence, the fact that word order overlap is the only feature shared by the two languages in the present comprehension study is worth particular attention.

I now move on to research question 3 (RQ3) which asked, "Will syntactic priming effects be modulated by the structure bias of the target verbs?" As with the previous research questions, the statistical analysis was done with the Linear Mixed Model fit by REML t-tests through Satterthwaite approximations to degrees of freedom, calculated with the *lmerMod* package in R. Again, for purposes of parsimony and straightforwardness, since priming effects were not registered for Condition 2 PO/EP-prime, the statistical analysis of the verbs as predictor variables are presented only for Condition 1 DO/CVC-prime. Table 12 below shows the summary of fixed effects in this condition, with target verbs as predictor variables.

Table 12
*Summary of fixed effects in Condition 1: DO/CVC-prime with target verbs as fixed factors*

| Description | Predictor | Coefficient | Standard Error (SE) | Degrees of Freedom (DF) | *t* (36) | *p*-value |
|---|---|---|---|---|---|---|
| Target verbs as fixed factors | Intercept | 2.748e-02 | 1.309e-01 | 5.121e+01 | 0.210 | =.835 |
| | granted | 5.865e-02 | 6.247e-02 | 4.093e+03 | 0.939 | =.348 |
| | handed | -6.452e-02 | 6.242e-02 | 4.093e+03 | -1.034 | =.301 |
| | lent | 1.653e-01 | 7.903e-02 | 4.093e+03 | 2.092 | =.037 |
| | offered | -4.573e-03 | 6.254e-02 | 4.093e+03 | -0.073 | =.942 |
| | promised | -3.589e-03 | 6.249e-02 | 4.093e+03 | -0.057 | =.954 |
| | rented | -2.033e-03 | 6.235e-02 | 4.093e+03 | -0.033 | =.974 |
| | sent | -1.213e-02 | 7.894e-02 | 4.093e+03 | -0.154 | =.877 |
| | sold | 1.895e-01 | 7.941e-02 | 4.093e+03 | 2.386 | = .018 |

Table 12 shows that most target verbs did not function as good predictors to facilitate processing time in the DO/CVC-prime condition. Only two target verbs were significant in isolation, but their combined strength was not sufficient to create syntactic priming effects in the condition as a whole, as attested by the significance level of the intercept ($p$=.835). In other words, the syntactic priming effects observed in the DO/CVC-prime condition were not determined by the interaction among target verbs. This finding rules out target verb structure bias as the predictor of the syntactic priming effects found in this condition. Hence, hypothesis 3 (H3) is confirmed.

That being said, sufficient material has now been gathered to answer research question 4 (RQ4), "What do the results of the self-paced reading task suggest about the shared-syntax vs. separate-syntax account and about the residual activation vs. implicit learning account?" First of all, it is important to point out that, with respect to condition 1 (DO/CVC-prime), the results of the present study are in line with previous cross-linguistic syntactic priming studies in comprehension which had found syntactic priming effects between languages that share a similar word order (e.g. Kidd et al., 2015; Felício, 2018; Weber & Indefrey, 2009). The

syntactic priming effects observed in the DO/CVC-prime condition add to the findings in support of the shared-syntax account which advocates that, when two languages spoken by a bilingual have a similar structure, at least some syntactic information is shared (McDonough & Trofimovich, 2009; Weber & Indefrey, 2009). Only in this way can structures that have been recently activated in one language become more readily accessible in the other language so that they can be activated more effortlessly. This entails that the two languages are engaged at the same time to avoid redundancy and facilitate code-switching, something which would be cognitively more costly if syntactic information was stored separately.

On the other hand, the absence of syntactic priming in condition 2 (PO/EP-prime), in the presence of similar word order, might be explained by the structure bias of the participants who demonstrated their preference for the PO to the detriment of the DO in the baseline. The literature has shown that syntactic priming effects are more likely to occur between structures that are less favored by the participants (Bernolet & Hartsuiker, 2010; Jaeger & Snider, 2007; Pickering & Ferreira, 2008). In the case of the present study, the less favored structure is the DO. Hence, the findings are consistent with the prediction found in the literature.

Likewise, syntactic priming effects in the PO/EP-prime condition might have been further hindered by the absence of lexical repetition between prime and target sentences. In fact, lexical repetition has been considered an essential ingredient for obtaining syntactic priming effects in comprehension studies (e.g. Arai et al., 2007; Weber & Indefrey, 2009). However, since one of the goals of the study was to allow the results to arbitrate between the residual activation and the implicit learning accounts, it was necessary to design lexically-independent conditions. This is because the language pairings in this study have the same word order. Having the two features (word order *and* lexical repetition) would make it more difficult to determine the source of any syntactic priming effects eventually encountered.

Regarding the residual activation vs. implicit learning accounts, having ruled out other factors that could explain the syntactic priming effects found in condition 1 (DO/CVC-prime), and before the failure of the double primes and of the target verbs to modulate the priming effects observed, word order is left as, potentially, the main factor supporting the interaction between the two linguistic systems. In this respect, the priming effects found in the present comprehension study are aligned with Kidd et al.'s (2015) findings suggesting that cross-linguistic syntactic priming "appears to be particularly dependent on word order overlap between functionally equivalent structures between languages" (p. 1066). Hence, hypothesis 4 (H4) is confirmed.

In conclusion, the results of the present study replicate previous cross-linguistic syntactic priming findings in the modality of comprehension that support the shared-syntax account. However, the previous studies for which the syntactic priming effects were lexically driven and, thus, supporting the residual activation account (e.g. Felício, 2018; Weber & Indefrey, 2009), the syntactic priming effects observed in the present study (in the L1DO/CVC-prime condition) are more consistent with the implicit learning account, since word order overlap was the only aspect shared between the paired languages and the idea that syntactic priming is triggered by procedural learning of abstract syntactic rules from recurring sentence structures (Bock, Dell, Chang, & Onishi, 2007; Chang, Dell, & Bock, 2006; Chang, Dell, Bock, & Griffin, 2000; Kaschak et al., 2011). This study confirms that, at the implicit level, processing strategies in the target language are not independent of the structure instantiated in the source language. The next chapter will focus on the investigation of cross-linguistic influence at the explicit level among late L3 English learners at initial stages of L3 acquisition.

# CHAPTER VIII

# STUDY III: INVESTIGATING CROSS-LINGUISTIC INFLUENCE IN WRITTEN PRODUCTION

The present chapter reports the findings of Study III on cross-linguistic influence in written production. The study was conducted with the participants from Pool 2, described in Chapter V, section 5.3. Study III uses off-line tools to collect data on the modality of writing to add to those of oral production and reading comprehension generated from the syntactic priming studies. The aim of the present study is to find out if at initial stages of L3 acquisition (A1/A2 of CEFR) in which explicit cognitive processes are more likely to be engaged, the participants' written translations of dative structures in L3 English is supported by the dative structure from each source language or is determined by the structure supplied by their preferred language (expressed in the questionnaire).

To achieve this goal, the study employs a mixed-method research design, using qualitative and quantitative research techniques. The data was obtained through a biographical and language questionaire (see APPENDIX B) and through the translation task (see APPENDIX C3). The questionnaire was semi-structured to generate qualitative information about participants' attitudes towards the source languages and quantitative information about their preference for one of the source languages to assist L3 learning. The translation task consisted in the translation into L3 English of covert dative structures provided in each source text. The quantitative information about language preference supplied by the questionnaire was then statistically compared against the data from participants' actual use of dative structures in the translation task. In this way it would be possible to find out if the use of dative constructions in L3 English among the participants is governed by preset language preference or by the stimulus language.

The chapter opens with section 8.1 in the general research question guiding the dissertation (see Chapter V, section 5.1) is decomposed into the specific research questions and hypotheses that orient the present study. After that, section 8.2 describes the participants' backgrounds concerning the languages involved in the study. In section 8.3 and subsections, the study's instruments and procedure are described. Next, section 8.4 and subsections describe the techniques for the analysis of the qualitative data generated by the biographical and language questionnaire and then presents the statistical test used for analyzing the quantitative data obtained through the translation task. Lastly, section 8.5 and subsections analyze the attitudes and opinions expressed by the participants in the questionnaire about their preference between L1CVC and L2EP to support L3 English learning against their actual use of the DO or PO structures, prompted respectively by the L1CVC and L2EP, in their L3English written translations.

## 8.1 RESEARCH QUESTIONS AND HYPOTHESES

Study III targets the issue of acquisition addressed in the central research question of the present dissertation (see Chapter V, section 5.1). That said, the specific research questions tackled in this study are grouped according to the characteristics of the research instruments used to generate qualitative and quantitative data. Hence, the biographical and language questionnaire, which is chiefly concerned with qualitative data (although it also generates quantitative data), is guided by the following research questions:

RQ1: Which of the source languages (L1CVC or L2EP) will participants elect as preferable to support their EFL learning?

RQ2: What attitudes (positive and negative) will participants' responses reveal in relation to the use of the L1CVC and of the L2EP?

The translation task is only concerned with the quantitative data and is oriented by the following twofold research questions:

RQ3: Is the use of the dative structure (DO or PO) in the L3 English written translations better explained by the source language used in the text (L1CVC/L2EP) or by preset source language preference?

RQ4: In case the source language used in the text is a better predictor of the dative structure used in the translation, what role do the dative verbs play in this process?

The following hypotheses were proposed in response to the research questions:

H1: The L2EP will be elected as the preferred language to support EFL learning.

This hypothesis is based on the fact that the L2EP is the dominant language with respect to writing in the Cape Verdean educational context. Cape Verdeans are taught to read and write through the standard L2EP writing system. Hence, it is expected that the L2EP will be the preferred language to support L3 learning among participants.

H2: Participants will reveal positive attitudes towards the L2EP and negative attitudes towards the L1CVC.

This hypothesis is based on the historical background of the downgrading of the L1CVC (Brito-Semedo, 2006; Furtado, 2010; Pereira, 2006) as well as on its present status of informality which is in contrast with the exaltation of the L2EP which is granted the status of official language. It is also based on the suggestion by Dabène (1994, cited in Lopes, 2011) that, when two (or more) languages coexist in a society on unequal basis, there is the tendency for speakers to assume a positive attitude towards the language of greater representativeness which, in its turn, may entail attitudes of resistance to valuing the minor language.

H3: The source language will be a better predictor than language preference for the dative structure used in the L3 English written translations.

This hypothesis is grounded on the fact that participants are at initial stages of L3 English acquisition and on the predictions of the Typological Primacy Model (TPM) (Rothman et al., 2015). On the one hand, participants' low proficiency is expected to constrain their autonomous use of the target language, hence, blocking their prior structure bias, and making them more susceptible to align to the source text. The TPM advocates that, at initial stages of L3 learning, either the L1 or the L2 can be a potential source of transfer, but that what ultimately determines the source language to be transferred is the perception of "underlying structural similarity between the languages at play" (Rothman, 2015, p. 5). Since the dative structure prompted by either source language finds a match in the target language, it is expected that the structural similarity induces the reuse of the dative structure from the stimulus language.

H4: If the source language used in the text is a better predictor of the dative structure used in the written translation, the dative verbs from each source language will have played a decisive role in the process.

This hypothesis is based on the non-alternating feature of the dative verbs from each source language and, again, on the fact that participants are at initial stages of L3 English acquisition. The dative verbs from each source language in the text only select for one dative structure. Since each participant saw only one source text, and given their limited knowledge of the target language, the dative structure used in the translated text is more likely to reflect the structure selected by the verb from the source text they saw.

## 8.2 PARTICIPANTS AND SETTING

Thirty young-adult participants (15 females) volunteered to answer the biographical and language questionnaire and complete the translation task. All were native speakers of CVC and fluent speakers of L2EP which they started learning at school ever since they were

six years old. Regarding proficiency in L3 English, all reported being at elementary/beginner levels (A1/A2 of CEFR) and none had lived in an English-speaking country before. This information was confirmed by their English teachers who agreed to apply the translation task and biographical and language questionnaire. Data was collected in three different English schools located in the city of Praia, the capital of Cape Verde. By the time of data collection, participants had achieved a workload in English lessons ranging from 30 to 72 hours (*M*=57.7; *SD*=9.7). For more information about participants' profile see Table 2 presented in Chapter V, section 5.3.

## 8.3 MATERIALS AND PROCEDURE

Study III was conducted by means of two research instruments: the biographical and language questionnaire to inquire participants about their attitudes towards the L1CVC and L2EP and about their preference between the two source languages to support L3 English learning; and the translation task which aimed at finding out which source language is more likely to be used to support L3 English writing and whether such use is better explained by the language bias evidenced in the questionnaire or by the dative structure (DO or PO) prompted by the source language in the text.

### 8.3.1 The biographical and language questionnaire

The biographical and language questionnaire was made up of ten questions. Questions 1 through 6 were close-ended and aimed at collecting information about participants' personal profile (age, gender, nationality, length of residence in Cape Verde) and linguistic background (age of acquisition of L1CVC, L2EP, and L3 English; and perceived proficiency in L1CVC, L2EP, and L3 English). Questions 7 through 10 were semi-structured to supply qualitative and quantitative data with respect to the circumstances in which participants used written L1CVC, whether they believed that L1CVC could be helpful in L3English learning, how

many hours per day (on average) they had contact with written L1CVC and written L2EP, and which language (L1CVC or L2EP) they would prefer to use to support their understanding or writing of L3English.

It is important to emphasize that the answer given by each participant to question 10 is vital for the purposes of Study VIII, because it provides the most explicit and, hence, definitive information about source language preference to be quantified in the translation task. The open ended answers to the semi-structured questions are expected to shed light on the question raised in Chapter I which asked, "To what extent does the social status of a language determine a bilingual's preference or disregard towards it?" Due to its subjective nature, I proposed to approach it from a qualitative perspective. Details on the analysis are provided below, in section 8.4.1.

In order to avoid comprehension issues deriving from the participants' low proficiency levels, all of the questions in the biographical and language questionnaire were written in Portuguese. A summary of the relevant information obtained with respect to personal profile and language background is provided in Table 2 about the profile of participants from Pool 2 (see Chapter V, section 5.3).

### 8.3.2 The translation task

The translation task was used to evaluate the extent to which participants' use of dative structures (DO and PO) in the target language in writing mirrors the structure prompted by the source language used in the text. The task consisted in the translation, from the L1CVC and from the L2EP into L3 English, of two texts written in the form of conversations containing approximately 300 words each.

Covert in each text, there were six instances of dative structures, the DO for the text written in L1CVC, and the PO for the text written in L2EP. The content of one text was the

translation equivalent of the other, thus, the same content should appear in the target language with the only difference residing in the dative structure. In this sense, to prevent the thirty participants from translating the same content twice, half of them received the text in L1CVC, and the other half received the text in L2EP. Each participant was given about 60 minutes to complete the task. In the end, each participant would provide six answers to be converted in data points in the statistical analysis.

Since the research was focused on the use of syntactic structures, in order to avoid vocabulary issues as a result of participants' low proficiency level in the target language, all participants were allowed to use a dictionary to consult unknown words. The translation task was completed at an average of 40 minutes per participant.

## 8.4 DATA ANALYSIS

This section describes the approach used for the analysis of the qualitative data collected through the semi-structured biographical and language questionnaire and then presents the statistical test used to perform the analysis of the quantitative data obtained partially from the questionnaire (about participant's language preference) and partially from the translation task (use of dative structures in written translations).

### 8.4.1 The approach to developing the qualitative analysis

The analysis of the biographical and language questionnaire was descriptive, following the narrative analysis approach to unveil and interpret the nuances concerning language attitudes evidenced in participants' responses to the questionnaire, as well as their bias towards one of the source languages to support writing in the L3English. The narrative analysis approach entails the identification of recurrent themes, sequence of events, or patterns that emerge in the answers given by a set of informants in an interview (or

questionnaire, as is the present case), with the purpose of creating a story that coherently reflects the social backgrounds and experiences of the larger population.

In other words, the narrative analysis aims at "reconstructing social events from the point of view of informants" (Muylaert, Sarubbi, Gallo, Neto, & Reis, 2014, p. 184).

That said, when building the narrative analysis the researcher must be extremely cautious not to obscure the informant's intended message, a situation that may happen when the reseacher attempts to encounter a formal way of dealing with the spontaneity and subtlety that may characterize the informants' discourse. While not having to use the exact same words used by the informant, the researcher must skillfully find ways to remain faithful to the implied or expressed meaning in the informant's original message. Often, this requires an acute ability to *read between the lines* when trying to retrieve implied meaning.

Nevertheless, given the straightforwardness of the semi-structured questions in the biographical and language questionnaire, the narrative analysis turned out not to be so demanding an enterprise. The answers were, in most cases, unambiguous, leading to objective interpretations.

### 8.4.2 The quantitative analysis procedure and statistical test

For the quantitative analysis, in order to tackle RQ3 and RQ4, the dative structures used in the translated texts were coded as 0 and 1, for PO and DO, respectively and labeled as *answer*. Then of DO and PO answers were measured against the instances in which the L1CVC and L2EP were administered as the source languages in the texts to verify if the structure prompted by the text matched the structure used in the *answers*. On a second moment, the *answers* were compared with the instances in which each of the source languages (L1CVC or L2EP) was reported in the questionnaire as being best fit to support written L3 English. This was done to find out if the source *language preference* expressed in the

questionnaire corresponded (or not) to the actual use of the PO and DO constructions in the translated text in the target L3 English language among these participants. Table 13 provides a sample of the coding.

Table 13
*A sample of the coding of the data from the Translation Task and from the Biographical and Language Questionnaire*

| Participant No. | Source text | Reported source language preference to support L3 Writing | Chosen structure in L3 English (PO=0; DO=1) |
|---|---|---|---|
| 1. | L2EP | L2EP | 0 |
| 2. | L2EP | L1CVC | 0 |
| 3. | L2EP | L2EP | 0 |
| 4. | L2EP | L1CVC | 1 |
| (…) | (…) | (…) | (…) |
| 28. | L1CVC | L2EP | 1 |
| 29. | L1CVC | L1CVC | 1 |
| 30. | L1CVC | L2EP | 0 |

The statistical analysis was carried out with the generalized linear-mixed model fit by maximum likelihood (Laplace Approximation), calculated with the function *glmer*, package *lme4 in* R package (Bates, Maechler, Bolker, & Walker, 2015).

## 8.5 RESULTS AND DISCUSSION

This section presents and discusses the findings in response to RQ1 and RQ2 posed within the qualitative research design, and those related to the RQ3 within the quantitative part of Study III. I reiterate the purpose of Study III which is to find out which of the source languages (the L1CVC or the L2EP) has a greater influence in the L3 English written productions of Cape Verdean-Portuguese bilinguals at initial stages of EFL learning, and whether this influence is better explained by the dative structure prompted by the source language or by the source language preference reported in the answer to the biographical and language questionnaire. I will start by presenting the results of the qualitative part.

### 8.5.1 The qualitative research findings

The analysis carried out in the present subsection will solely tackle the open-ended parts of the semi-structured questions (7 through 10) in the biographical and language questionnaire in response to research question 1 (RQ1) and research question 2 (RQ2). As mentioned elsewhere, I adopted the narrative analysis approach to qualitative data, which draws on recurrent themes, sequence of events, or patterns identified within the answers given by each participant to recreate social events from their points of view (Muylaert, Sarubbi, Gallo, Neto, & Reis, 2014) without obscuring their intended message. Again, due the directness that characterized the questions, the answers are also expected to be unanbiguous, thus, reducing the risk of misinterpretation to the minimum.

It is worth recalling that the questionnaire was designed in Portuguese to prevent possible confusion when participants answered the questions, as a result of their low proficiency level in the target language. I shall start the analysis from question 7, which asked, "Do you use the CVC in writing on a daily basis? If so, in what situations?" All participants answered "Yes" to this question. Instant text messaging through social networking tools such as Facebook Messenger, Viber, or Whatsapp stood out among the most frequently indicated situations in which written L1CVC is used. Other less frequent situations pointed out by some participants include personal notes left at home to an absent relative to praise or complain about something, notes to a workmate about a momentary absence from the workplace, secret notes to a classmate, etc.

In general, the situations in which written L1CVC is used on a daily basis, as depicted in the answers to question 7, appear to be in line with the idea of social restrictiveness referred in Chapter II under the discussion of the state of diglossia that presently typifies the use of L1CVC and L2EP in the different communication modalities, especially in writing.

Participants seem to endorse the belief that the use of written L1CVC must be confined to the intimacy of the familial environment as a rule of thumb, to deal with home issues or, if extended to social interactions, it should be saved to informal moments in which close friends are the interlocutors, such as in social networks, during breaks at the workplace, or through secretly exchanged notes in the classroom.

However, when answering question 8 ("Do you think that the CVC can be useful in the learning of English? Explain"), nineteen participants said "Yes", and gave various types of justifications, stemming from perceived linguistic similarity to affective connections with the L1CVC. Some of the most relevant answers are presented below in their original language with their respective English translations:

*Sim, porque sinto-me mais à vontade com o crioulo.* "Yes, because I feel more comfortable with CVC." (Participant 2)

*Sim, porque várias palavras que usamos existem em inglês*. "Yes, because many words we use are also found in English." (Participant 5)

*Sim, porque [o crioulo] ajuda a compreender mais rápido [o inglês]*. "Yes, because CVC helps to understand English faster." (Participant 11)

*Sim, porque é a língua que eu aprendi desde nascença*. "Yes, because it is the language I learned from birth." (Participant 19)

If the justifications given by participants 5 and 11 suggest that linguistic similitude between the source and the target languages is indispensable to facilitate learning (this idea is patent in the answer given by participant 5, despite lacking examples; in participant 11, it is implied), participants 2 and 19, suggest that their learning of a new language can be mediated by the source language with which they nourish an affective bond, irrespective of linguistic likeness that it may share with the target language. The relationship between the affective

bond with the L1CVC and the positive attitudes towards it manifested by these participants is explained by Dabène (1994, as cited in Lopes 2016) as a demonstration of the sentimental function of the language as a result of its connection with the relational universe of the speaker.

Conversely, if for some reason, such as social stigmatization of the language, the affective bond is not developed or is broken, the result may be the emergence of feelings of linguistic prejudice, downgrading of one's language, or even linguistic disloyalty (Labov, 1976, as cited in Lopes, 2016), which translate into negative attitudes towards the language even when the speaker himself/herself is not able to give a plausible justification for his/her negative attitude. This is evidenced in the following statements by two of the participants who answered "No" to question 8:

*Não, porque o crioulo é informal e sem regras linguísticas.* "No, because CVC is informal and lacks linguistic rules." (Participant 8)

*Não, porque tinha que ser inglês com português*. "No, because it had to be English with Portuguese." (Participant 18)

The long-standing misconception that a creole is not a language, but a dialect, continues to persist among ill-informed individuals, as shown in the answer given by participant 8. Unfortunately, such a statement is very frequently heard in Cape Verde, even in educational environments from the mouths of people with a considerable social responsibility. What follows from the above mentioned misconception is the idea that CVC is merely a "badly spoken Portuguese" (Irwin & Wilson, 2011, p. 36). The continued spread of such ideas only contributes to reinforce an already existing feeling of detachment from one's own language, leading to the self-prejudice and linguistic disloyalty referred by Labov (1976, as cited in Lopes, 2016). This is precisely what seems to emerge in the justification given by

participant 18, who, in the lack of a plausible reason to consider CVC as unfit to assist in the learning of English, just replaces CVC by Portuguese, which transmits a greater sense of safety given its higher social status.

With respect to question 9 ("On average, how many hours per day do you have contact with written L1CVC and written L2EP?"), several participants could not specify a number and left the question unanswered. Among those who answered (22 total), the numbers revealed a higher average for the L2EP (*M*=6.2, *SD*=1,7), which was already expectable. Yet, the L1CVC was not left far behind (*M*=4.7, *SD*=1.2). If the average hours reported here are minimally close to representing what happens in reality, then it can be said that written CVC is competing with written EP almost neck and neck, even though there are plenty of reasons to believe that this written CVC that participants referred to is by no means a standard one. This is because there are a number of limitations that hinder the dissemination of a standard written CVC, namely the lack of consensus among policymakers and scholars alike around the effectiveness of the ALUPEC (which makes its teaching and use of facultative character), the scarcity of bibliographies *in* and *about* CVC, the lack of government and institutional incentive to the production and reading of texts in CVC, and most importantly the current state of diglossia that characterizes the Cape Verdean linguistic context.

Therefore, the written CVC referred in the answer to question 9 is most likely the fluctuated kind of writing done in social networks, mentioned in their answers to question 7 ("Do you use the CVC in writing on a daily basis? If so, in what situations?") Considering their average age (*M*=24.2; *SD*=3.1), it is conceivable that these participants spend long hours using social networks, texting, chatting, and the like. Also, given the familial and friendly environments that often characterize social networks and the fact that CVC tends to be the default language in familial and friendly encounters, it is likely that participants spend the

whole time using CVC in those environments. Therefore, the average hours estimated above might well reflect what happens in reality and, if so, written CVC would be competing with written EP.

Although this competition would take place on an unequal basis, it might still be a first step towards a paradigm shift with respect to linguistic attitudes. As already discussed in the literature, language, identity and linguistic attitudes are intimately connected (Lopes, 2016). Hence, this consistent use of written CVC in social networks may begin to awaken, among Cape Verdean speakers, a certain sense of identification with and ownership of the CVC, which later may lead to a change of linguistic attitudes, from negative to positive.

The answers to question 10 ("If it is necessary to use a language to support your understanding or writing in English, which language would you prefer to use? The L1CVC or the L2EP? Explain") seem to point precisely towards this change of attitudes, since participants revealed a leveled degree of preference between the L1CVC and the L2EP, though with a slight tendency towards the latter (16 participants said they preferred the L2EP and 14 said they preferred the L1CVC). While the conscious choice between one and the other source language as better fit to assist in the learning of a target language helps to settle the question of participants' language bias, the reasons behind their choice are also worthy of attention, even if only to confirm the accuracy of the interpretation of the answers given to the previous semi-structured questions (which were deliberately designed to be intimately related to question 10 as a way to detect possible inconsistencies). Therefore, among those participants who were willing to provide an explanation, the following answers favoring each language were selected for analysis to help come to terms with the possible sources of language bias:

*Português, porque existem mais dicionários em português.* "Portuguese, because there are more dictionaries in Portuguese." (Participant 1)

*Crioulo, porque penso em crioulo.* "CVC, because I think in CVC." (Participant 2)

*Português, [porque] torna mais fácil a tradução.* "Portuguese, because it facilitates translation." (Participant 9)

*Português, porque desde os 6 anos de idade estou acostumado a [ter] explicação em português.* "Portuguese, I am used to being instructed in Portuguese ever since I was six years of age." (Participant 13)

*Português, porque é a língua oficial de Cabo Verde*. "Portuguese, because it is the official language in Cape Verde." (Participant 15)

*Português, porque não há dicionário no crioulo.* "Portuguese, because there are no dicitionaries in CVC." (Participant 17)

*Português, porque há situações em que não devemos falar o crioulo*. "Portuguese, because there are situations in which we should not speak CVC." (Participant 18)

*Crioulo, porque sinto-me mais à vontade com o crioulo*. "CVC, because I feel more comfortable with it." (Participant 19)

*Crioulo, porque é a língua materna.* "CVC, because it is the mother tongue." (Participant 20)

*Crioulo, porque ajuda a compreender mais e melhor.* "CVC because it helps to understand better." (Participant 24)

*Crioulo, porque entendo muito melhor do que o português.* "CVC, because I understand much better than portuguese." (Participant 29)

Just as evidenced in the answers to question 8, the answers to question 10 continued to point towards the affective bond as having a significant weight in the preference for the

L1CVC (e.g. participants 2, 19, and 20), whereas the societal norms and perceived linguistic breadth or status (social prestige) seem to play a stronger role in the choice of L2EP as the preferred support language for L3English learning (e.g. participants 1, 13, 15, and 18). Concerning societal norms, the answers seem to corroborate, to some extent, the observation by Dabène (1994, as cited in Lopes 2016) that languages have always been associated to social status or prestige (or the lack of it) and, thus, when two or more languages coexist in a society on unequal basis, speakers tend to assume a positive attitude towards the language of greater prestige, often as a means of personal or social promotion, while resisting to valuing the language of lower prestige.

Overall, the quantitative answers obtained through the semi-structured biographical and language questionnaire seem to confirm (though marginally) the predictions laid down in hypotheses 1 and 2 above, namely that the L2EP would be elected as the preferred language to support EFL learning (H1) and that participants would reveal positive attitudes towards the L2EP and negative attitudes towards the L1CVC (H2). Importantly though, in relation to H1, the results were not conspicuously bound towards the L2EP (out of 30 participants, 16 said they prefer L2EP), and regarding H2, the open-ended answers (particularly to questions 8 and 10) suggested that there is an emotional (affective) factor playing an important role in the relationship that participants have with the L1CVC.

Although this affective factor does not seem to supplant the greater status of the L2EP in their minds at the present time, it points towards an emerging positive attitude towards the L1CVC (if not already set in). This in turn may gradually contribute to creating a sense of identification and ownership in relation to the mother tongue and to its greater appreciation in the public spheres of the Cape Verdean society. Again, citing Martins (1994a, cited in Lopes, 2016), this entails its introduction in formal instruction as an autonomous discipline or as a

language of instruction. All things considered, the answer to RQ2 regarding the revelation of negative attitudes towards the L1CVC remains inconclusive, as participants seemed to evidence mixed feelings in relation to the mother tongue. The quantitative findings may help to shed a light into the issue.

### 8.5.2 The quantitative research findings

The analysis of the quantitative data obtained through the translation task (which includes data obtained from the quantitative part of question 10 in the questionnaire, regarding participants' language preference) tackles research question 3 (RQ) which asked: "Is the use of the dative structure (DO or PO) in the L3 English written translations better explained by the source language used in the text (L1CVC/L2EP) or by preset source language preference?" This question is twofold, which is why I will subdivide it into its two components for a better analysis.

However, I should start by defining the variables being considered in RQ3 in terms of possible interactions between them. There are three variables, one dependent (DV) and two independent (IV). The dependent variable is the *answer* (the written translation of the dative structure provided in the source text) which can be either DO or PO. One of the independent variables is *source language* (the language in the source text to be translated) which can be either L1CVC or L2EP. The other independent variable is *language preference* which can also be L1CVC or L2EP. As a note of reminder, the L1CVC always supplies the DO structure, whereas the L2EP is fixed towards the Po structure.

That said, the first question to be considered from the twofold RQ3 above is: "Is the dative structure (DO or PO) used the L3 English written translations induced by the source

language used in the text (L1CVC/L2EP)?" Figure 15 illustrates the interaction[83] between these two variables:

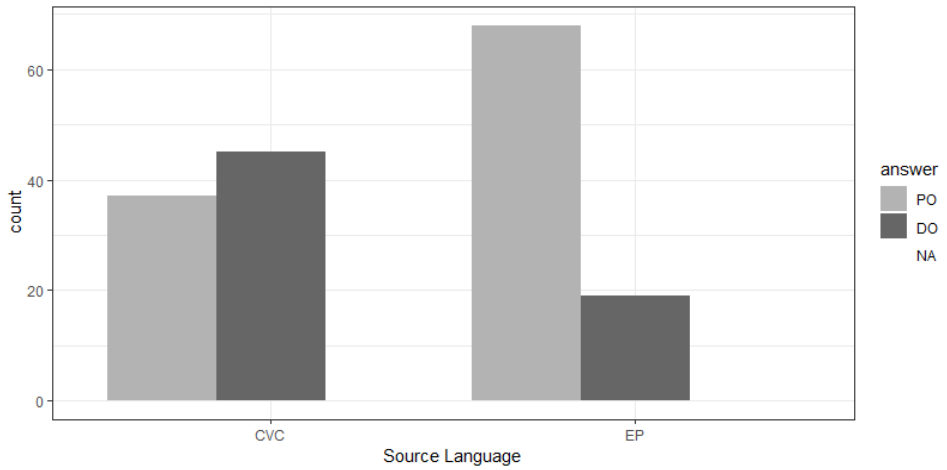



*Figure 15.* Interaction between *source language* and *answer*

Figure 15 suggests that there is a direct relationship between the source language that appears in the text and the dative structure that is selected to translate the original dative structure prompted by each source language. The DO answer prevails over the PO answer when the L1CVC is the source language. Conversely, when the L2EP is the source language, PO answers are more likely to occur than the DO alternative. This pattern shows that the stimulus language that is used to support L3 production in writing plays a significant role to determine the dative structure that is selected by the participants in their use of the target language (L3 English) concerning the dative structures.

I will now consider the second question from the twofold RQ3: "Is the dative structure (DO or PO) used in the L3 English written translations induced by preset source language preference?" The IV now is *language preference*. The DV remains as *answer*. The interaction between them is shown in Figure 16:

[83] It was not possible to calculate the significance levels of the PO and DO production in each source language for two reasons: 1) because the variables contain percentage data; 2) because *source language* is a binomial categorical variable, it does not allow a linear model to test the predominance of a binary value in a single-level variable.

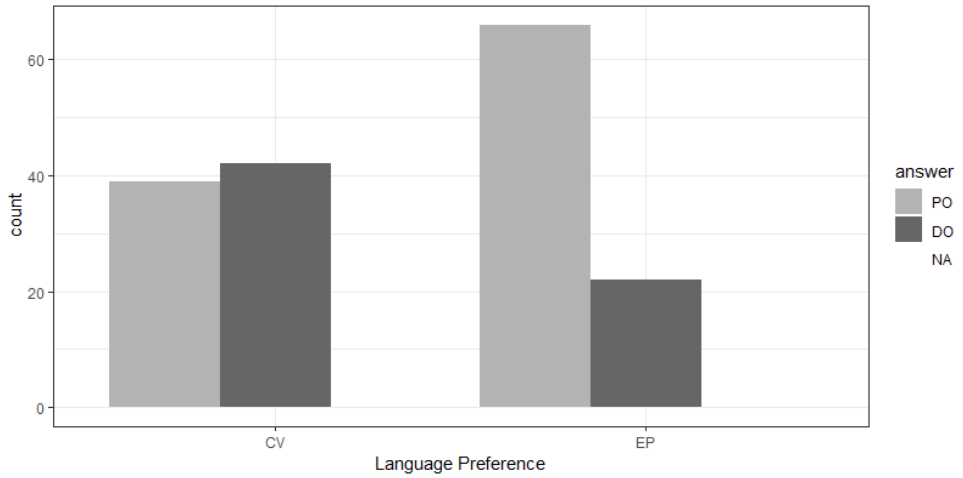



*Figure 16.* Interaction between *language preference* and *answer*

Figure 16 displays a pattern identical to the one observed in the previous situation, in Figure 15. In this case, the language that was reported as the preferred one to support L3 learning plays a significant role to determine the structure that is selected in the written production. There are more DO answers when the L1CVC is reported as the language of preference. On the other hand, there are more PO answers when the L2EP is the preferred language. Therfore, it is possible to conclude that, when analyzed separately both *source language* and *language preference* seem to be good predictors for the *answer*.

Then it was necessary to run another statistical analysis, with the two IV's interacting as predictor variables to verify if there would be any difference in their significance levels. As mentioned earlier, I used the generalized linear-mixed model fit by maximum likelihood (Laplace Approximation), calculated with the function *glmer*, package *lme4 in* R package (Bates, Maechler, Bolker, & Walker, 2015). The analysis confirmed the initial idea given by Figure 15 and Figure 16 that the two variables are, in fact, good predictors. However, the intercept value was not statistically significant ($z$=1.12, $p$=.261), denoting that there was no interaction between the predictor variables. Hence, together, they do not explain the choices made between the two dative structures in the written translations.

Nonetheless, it was possible to observe through the significance levels that *source language* was a better predictor than *language preference* (*source language*: $z$ = -3.55, $p$<.001; *language preference*: $z$ = -3.13, $p$<.002). This finding confirms hypothesis 3 (H3) and provides further support for the argument sustaining the Typological Primacy Model that "proximity in actual or perceived linguistic typology between the target L3/L*n* measured against the grammars of the L1 and L2 is the most deterministic variable to predict which of these previous systems is selected for adult multilingual syntactic transfer" (Rothman, 2010, p. 108). On the other hand, the fact that either the L1 or the L2 was transferred into the L3 contradicts the prediction of the L2 Status Factor[84] (Bardel & Falk, 2007) that posits that, because it was the language learned just prior to the L3, "the L2 acts like a filter, making the L1 inaccessible" (p. 480).

This finding, subsequently leads to the investigation of research question 4 (RQ4) which was formulated on condition that H3 was confirmed. I will recapitulate RQ4 which asked: "In case the source language used in the text is a better predictor of the dative structure used in the translation, what role do the dative verbs play in this process?" To tackle this question, hypothesis 4 (H4) postulated that: "If the source language used in the text is a better predictor of the dative structure used in the written translation, the dative verbs from each source language will have played a decisive role in the process." Figure 17 presents the verbs that were used in each source text with their respective English translations between parenthesis:

[84] The same pattern had been observed in the pilot study (with eight participants), then contradicing hypothesis 2 which was based on the L2 Status Factor.

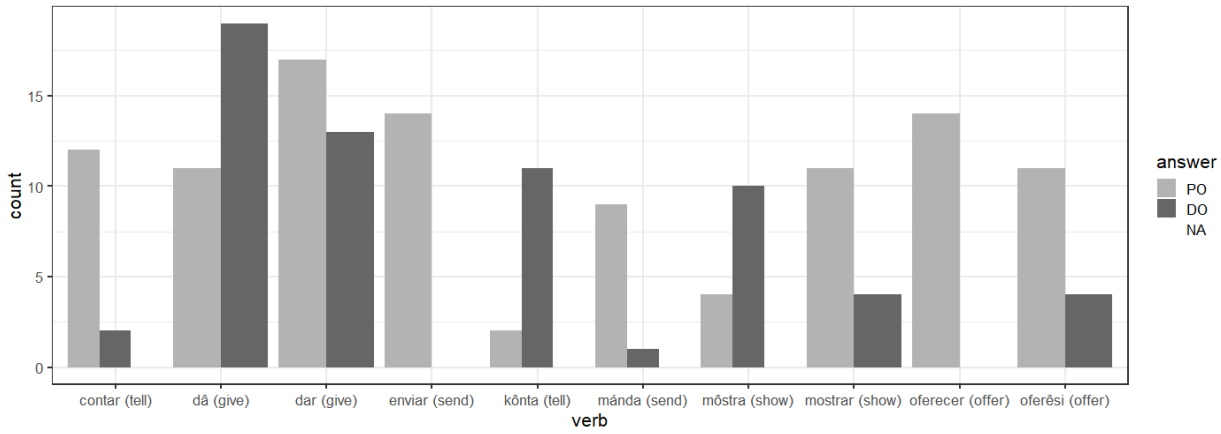



*Figure 17.* Interaction between *verbs from source language* and *answer*

Figure 17 is very elucidating on the role of the verbs from the source language to determine the dative structure used in the target language. It is possible to notice that the translation equivalent verbs from each source language alternate towards one and the other dative structure, in accord with the source language that in which the verb was presented in the source text. This is a clear indicator of the strength of the *verbs from the source language* to determine the *answer* in the target L3 language written production among learners at initial stages of L3 acquisition. They could give independent answers by selecting either of the two dative constructions represented in their minds through each of their source languages, or remain faithful to the PO structure supplied by the L2 EP they expressed preference for. Instead, they follow the text *ipsis litteris*, and their use of dative construction in the target language is totally governed by the verb bias of the source text. Contrarily to what would be expectable from more advanced learners, would could exhibit a more independent use of the targte language, these learners are still largely dependent on *cues* presented to them in the source language (see Bates & MacWhinney, 1982, 1989).

The above displayed pattern reinforces the finding in RQ3 that attributed a more significant role to the *source language* than to prior *language preference* to mediate the written production of dative structures in L3 English. It also confirms hypothesis 4 (H4)

presented in response to RQ4 above, ascribing a decisive role to the *verbs from the source language* in this process due to their non-alternating feature as well as the fact that at initial stages of L3 English acquisition, participants are more prone to aligning their processing and learning strategies to the source text.

Concerning the predictions laid down in the relevant literature on cross-linguistic influence (CLI), this finding is in line with the argument that CLI occurs "very frequently as a learning strategy by which the learner uses his or her knowledge of one language as a resource for formulating hypotheses about the forms, structures, functions, meanings, rules, and patterns of another" (Jarvis & Pavlenko, 2008, p. 9). These participants' learning strategies are, hence, in accordance with the prediction of the Competition Model (Bates & MacWhinney, 1982, 1989; MacWhinney, 2005) regarding input-driven learning.

In other words, their learning can be described as input-driven in the sense that it relies on the input language to provide cues that will be identified as similar or different between the language pairings at hand. In the present study, the decisive cues are provided by "underlying structural similarity between the languages at play" (Rothman, 2015, p. 5), supporting the prediction of the Typological Primacy Model of L3 morphosyntactic transfer. The results are consistent with Maia & Maia (2005) concerning the influence of the stimulus language on target language processing strategies and in disagreement with Fernández's (2003, 2005) view that parsing in the target language operates independently of the stimulus language.

To wrap up, Study III has shown that the use of the L1CVC dative stimulus constrained the initial L2EP preference to support L3 English learning expressed in the questionnaire. As a result, the translation task showed that the language of input (either the L1CVC or the L2EP) functions as a better predictor (statistically more significant) than prior language bias (L2EP) to inform L3English written production of dative constructions.

# CHAPTER IX

# CONCLUSION

Various factors pertaining to a bilingual's accumulated experience with the languages he/she speaks from an early age influence his/her posture towards those languages. Such posture may turn out to be decisive to the way a bilingual will behave when learning a third language after puberty age, namely in terms of the criteria he/she will adopt to select one of his/her prior languages to support processing strategies in the new language.

Debate has it that these strategies may alternate according to perceived structural similarities (conscious or unconscious)[85] between the source and target languages, allowing either of the previously learned languages to mediate target language processing (Hartsuiker et al., 2016; Jarvis & Pavlenko, 2008; Maia & Maia, 2005; Ringbom, 2007; Rothman et al., 2015), or that processing strategies may be inflexibly governed by only one of the previously learned languages, depending on whether the language was learned just prior to the target language – L2 Status Factor (Bardel & Falk, 2007), or even that the human sentence processing mechanism operates in the same way (bidirectionally for the bilingual's two languages), regardless of the stimulus language (Fernández, 2005).

The present chapter aims at summarizing the main findings of this dissertation which aimed at illuminating the debate surrounding cross-linguistic influence (CLI) at the level of the syntactic interaction between a bilingual's previously learned languages and the language being currently learned at beginner and intermediate stages of L3 development. To this purpose, three studies (reported in Chapters VI through VIII) were carried out, each concerned with one specific modality of communication to tap into implicit and explicit

[85] According to Jarvis and Pavlenko (2008) perceived similarity refers to "a conscious or unconscious judgment that a form, structure, meaning, function, or pattern that an L2 user has encountered in the input of the recipient language is similar to a corresponding feature of the source language" (p. 179).

syntactic processes underlying CLI. Section 9.1 provides a summary and review of each study, focusing on their main findings and contributions to the existing literature. Section 9.2 raises some pedagogical implications concerning EFL teaching in the Cape Verdean educational context, taking into account the findings reported in the three studies in the present dissertation Finally, section 9.3. acknowledges the limitations of the three studies and provides some suggestions regarding related topics to be investigated in future studies.

## 9.1 SUMMARY OF RESEARCH FINDINGS

The three studies carried out in the present dissertation had one goal in common: to investigate the role of the previously learned L1CVC and L2EP on the processing strategies of dative constructions in target L3 English. Through the use of a specific task adjusted to its internal goals, each study followed a different pathway which conducted to the fulfillment of the main goal of the dissertation. Together, the three studies have consistently demonstrated that the source languages used as stimuli mediate processing strategies in the target L3 English language for dative constructions in the three different modalities tested. Depending on the task used, and on participants' target language proficiency levels, this mediation has been shown to happen implicitly (through the syntactic priming tasks) or to be consciously monitored (through the translation task).

Below, I present a summary of the main findings reported in the present dissertation within the syntactic priming experiments, the translation task and the biographical and language questionnaire whose combined designs tapped into implicit and explicit cognitive processes underlying CLI among Cape Verdean-Portuguese bilinguals L3 English learners at different proficiency levels.

**Finding 1:** Syntactic priming effects were found, in the oral production and in the comprehension modalities for the L1CVC-L3 English pairing, but not for the L2EP-

L3English pairing. The priming effects replicate the prediction of the inverse preference effect (Pickering & Ferreira, 2008)

Based on the prediction of the inverse preference effect (Pickering & Ferreira, 2008), it was expected that syntactic priming effects in oral production were more likely to occur for the L2EP than in the L1CVC, given the fact that the latter is the dominant language when it comes to oral production in the Cape Verdean context. However, the baseline – which aimed at obtaining participants' free descriptions of the dative pictures presented to them – showed that participants were strongly biased towards the PO structure, which exists only in the L2EP, even though the target dative verbs were balanced as to their structure bias. Consequently, when the DO prime condition was introduced through the exposure to L1CVC dative sentences, the production of the DO increased significantly ($p<.001$) in comparison to the pattern initially observed in the unprimed (baseline) condition.

Conversely, exposure to the PO prime condition through the L2EP sentences did not result in an increase of PO productions when compared to the unprimed condition. Contrary to expected, there were significantly more DO responses in the PO prime condition than there were in unprimed condition. But this might have something to do with counterbalancing errors in the implementation of the task, with more participants starting with the DO primes (20) than with the PO primes (16). In any case, this occurrence does not seem to raise any objection to the fact that the DO prime strongly influenced participants' processing preference, leading them to unconsciously switch their established processing strategies mediated by the L2EP, ending up with a stronger reliance on the L1CVC.

Concerning the comprehension modality, the initial expectation that syntactic priming would be stronger for the DO construction than for the PO construction, based on the fact that the PO is prompted by L2EP, which is the dominant language in reading, was confirmed. In

the DO/CVC-prime condition, participants processing of the region of interest (ROI) was significantly faster in the target sentence than in the prime sentence denoting a priming effect. In the PO/EP-prime condition, there was no significant difference in processing time from prime to target sentences, probably due to established routines in reading based on the L2EP and in the L3 English writing systems. On the other hand, poor reading habits in the L1CVC combined with (or, prehaps, *due to*) its status as the less preferred language might have been in the origin of the gap registered in the reading times from prime to target sentences. It is possible to observe that the mean reading times for the prime sentences in the L1CVC-prime are slower than for the L2/EP-prime. Together, the experiments replicate the findings in previous syntactic priming studies which have supported the prediciton of the inverse preference effect (Pickering and Ferreira, 2008) that the structure that is less favored is more likely to trigger syntactic priming effects. Hence, the results of each experiment show that, at the implicit level, the L1CVC has a significant impact on processing strategies for the dative structures tested.

**Finding 2:** Syntactic priming effects found in the oral production and in the comprehension modalities provide support for the implicit learning account and for the shared syntax account

The effect of prime verb bias to modulate syntactic priming within and across languages has been fairly established in the literature on the basis that "priming effects tend to be stronger when the construction in the PRIME [authors' emphasis] sentence is surprising on the basis of the verb, such as when the prime sentence is a PO sentence with a DO-biased verb", allied to the unexpected dative structure following the target verb (Kootstra & Doedens, 2016, p. 713). More particularly, syntactic priming has been shown to be strongest when the prime sentence verbs have a non-alternating feature (e.g. Melinger & Dobel, 2005; Salamoura & Williams, 2006) – as is the case with the prime verbs in the present dissertation

– or are very strongly biased towards either dative structure (e.g. Bernolet & Hartsuiker, 2010; Kootstra & Doedens, 2016). On the other hand, according to Kootstra and Doedens (2016), fewer studies have focused on the role of the target verbs to modulate syntactic priming effects, which is why the present dissertation aimed at contributing to filling this gap in the literature through the syntactic priming experiments carried out in the production and comprehension modalities.

However, as predicted in hypothesis 2 of Study I (picture description task), and in hypothesis 3 of Study II (self-paced reading task), the participants' sensitivity to the target verb bias did not reach a significantly strong level to instantiate the syntactic priming effects observed. This was demonstrated in the statistical tests carried out through the generalized linear mixed model in each condition. The tests did not reveal a significant influence of the target verbs in the syntactic priming effects observed. The effects found can be better explained by the fact that participants were exposed to non-alternating DO verbs from the L1CVC in written form, which turned out to be 'surprising' in the context of the experiment, as participants have been more used to reading in the L2EP which only accepts the alternative PO structure (this and other social-related factors could help explain their PO bias observed in the baseline). This effect is predicted in the implicit learning account (Chang et al., 2006) by the model's ability to track down unexpected verb-structure combinations that are then reanalyzed (thus, triggering priming effects) leading to error-based learning.

Together, the syntactic priming effects found in the DO/CVC-prime condition in Study I and in Study II render further evidence in support of the shared-syntax account which posits that, when two languages spoken by a bilingual have a similar structure, at least some syntactic information is shared (McDonough & Trofimovich, 2009; Weber & Indefrey, 2009). The absence of syntactic priming effects in the PO/EP-prime conditions in each syntactic

priming study cannot be interpreted, however, in terms of the separate-syntax account as such an account is not consistent with the findings from numerous previous studies carried out either through behavioral or more sophisticated methods such as fMRI or ERPs (e.g. Golestani et al., 2006; Hernandez et al., 2010; Indefrey et al., 2001; Luke et al., 2002; Weber & Indefrey, 2009.) which have attested that, "overall both low and high proficiency bilinguals engage for L2 the same neural structures responsible for grammatical processing in L1" (Abutalebi, 2008, p. 470). This means that L2 acquisition is mediated by an existing network used for L1 processing (see Abutalebi, 2008, for a review). On the other hand, it is difficult to explain by means of a separate-syntax account how is it that bilinguals are able to code-switch or code-mix if they can only activate one of their languages at a time. Such a view would entail that the same syntactic information is represented twice, leading to redundancy and and unnecessary cognitive costs in processing.

**Finding 3:** The source language is a better predictor than prior language preference for the dative structure used in the L3 English written translations among learners at initial stages of L3 acquisition

The translation task showed that the source language used in the text to be translated is a better predictor than prior language preference (expressed in the answer to the questionnaire) to explain the dative structure that was used in L3 English written productions among adult L3 English learners at initial stages of L3 acquisition. The statistical tests carried out with the generalized linear-mixed model yielded a higher significance level for *source language* ($z$ = -3.55, $p$<.001) than for prior language preference ($z$ = -3.13, $p$<.002). This finding speaks to the role of the language of input to determine these learners' use of the target language irrespective of their initially stated language preference.

Hence, the results support the *input-driven learning* account advocated in the Competition Model (Bates & MacWhinney, 1982, 1989; MacWhinney, 2005) with the idea that when learning multiple languages, learners rely on surface cues (e.g. as word order) in each language that will help them to successfully identify similarities and differences between the languages involved. By the same token, the results also support the main argument of the Typological Primacy Model (Rothman et al., 2015) of L3 morphosyntactic transfer that perceived structural similarity constitutes the most important variable to predict which of the previously acquired linguistic systems will play a stronger role in the acquisition of the target lisnguistic system. The results also suggest that the dative verbs from each source language had a strong influence in the selection of the dative structure to be produced in the target language in written production. This could be drawn from the fact the structure used in each translated text consistently matched the structure allowed by the non-alternating verbs from each source text.

Conversely, the results of the translation task provide evidence against the L2Status Factor (Bardel & Falk, 2007) which sustains itself on the argument that, at initial stages of L3 acquisition, the L2 is the most probable candidate for transfer, working like a filter that blocks access to the L1. Finally, the view that processing in the target language operates independently of the stimulus language cannot explain the results obtained in the translation task and in the syntactic priming tasks developed in the present dissertation.

**Finding 4:** Participants revealed positive attitudes towards L2EP and mixed feelings towards L1CVC in their open-ended answers

This finding was drawn from the qualitative analysis of the open-ended answers given in the questionnaire by participants. These answers were expected to provide some clues for the question raised in Chapter I which asked, "To what extent does the social status of a

language determine a bilingual's preference or disregard towards it?" Due to the subjective nature that the qualitative analysis entails, it was necessary to adopt an approach that would help streamline interpretations. To this end, the narrative analysis approach to qualitative data was selected as the most appropriate technique, as it identifies recurrent themes, sequence of events, or patterns contained in the answers given by each participant in an attempt to recreate social events without obscuring their points of view (Muylaert, Sarubbi, Gallo, Neto, & Reis, 2014).

In order to facilitate the analysis, the same question was asked in different ways, so that any inconsistencies between the answers would be more easily detected. The questions inquired about the circumstances in which participants used written L1CVC, whether they believed that L1CVC could be helpful in L3English learning, how many hours per day (on average) they had contact with written L1CVC and written L2EP, and which language (L1CVC or L2EP) they would prefer to use to support their understanding or writing of L3English.

In general most participants (19 out of 30) agreed that the L1CVC could be helpful to support L3English learning, but when asked to select one source language between the L1CVC and the L2EP the majority (16) said they preferred the L2EP. Among the many reasons they gave to justify this choice, issues related to the social prestige of the L2 (in contrast with the stigma associated to the L1) stood out as the most frequently pointed out. For instance, statements like *Português, porque é a língua oficial de Cabo Verde*, "[I prefer] Portuguese, because it is the official language in Cape Verde" or *Português, porque há situações em que não devemos falar o crioulo*. "[I prefer] Portuguese, because there are situations in which we should not speak CVC " serve to illustrate this point. Such attitudes are predicted in Dabène (1994, as cited in Lopes, 2016), who states that languages have always

been associated to social status or prestige (or the lack of it) and, thus, when two or more languages coexist in a society on unequal basis, speakers tend to assume a positive attitude towards the language of greater prestige, often as a means of personal or social promotion, while resisting to valuing the language of lower prestige.

However, there were answers given by some participants which denoted na feeling of empathy towards the L1CVC. Two examples include, *Crioulo, porque sinto-me mais à vontade com o crioulo*. "[I prefer] CVC, because I feel more comfortable with it" or *Crioulo, porque é a língua materna* "[I prefer] CVC, because it is the mother tongue." Such answers were interpreted as an emerging sense of identification and ownership in relation to the L1CVC, which in the long run might lead to its greater appreciation in the public domains of the Cape Verdean society. However and still according to Martins (1994a, as cited in Lopes, 2016), this might entail its introduction by the government in formal instruction as an independent discipline or as a language of instruction.

## 9.2 PEDAGOGICAL IMPLICATIONS

The syntactic priming and translation tasks have generated findings that point to an important role of the L1CVC and of the L2EP to influence processing strategies in L3English, at least as far as the dative structures are concerned. In the case of the L1CVC, the findings are even more interesting because there is stronger interaction with the L3 English linguistic system when the cognitive processes are not available to conscious awareness. That is, at the implicit level, the L1CVC is more likely to be engaged to mediate processing strategies into the target language. The L2EP seems to operate more at the conscious level, i.e., when cognitive processes are explicit or monitored, particularly among low proficiency learners as shown in the translation task. However, even in this case, when the L1CVC structure is instantiated in the target L3English language, the L1CVC can also be selected as the support

language. This selection will depend on whether or not it is used as the language of input, as evidenced in the translation task findings.

Hence, the bottomline is, the L1CVC has the potential of operating at both implicit an explicit levels, whereas the L2EP tends to be engaged in a consciously controlled processing. This finding poses some pedagogical implications for EFL teaching as well as for other disciplines in the Cape Verdean educational context where the L2EP is the only language of instruction. Below I list some of these implications.

**Implication 1:** Cumulative exposure to L1CVC may promote the use of the DO construction which is more frequent in English than the PO counterpart

Syntactic priming experiments in which English was tested among native speakers have consistently demonstrated that the DO is the preferred structure (see Bernolet & Hartsuiker, 2010; Bock, 1989; Bock & Griffin, 2000; Kutta et al., 2017), since stronger priming effects have been more frequent with the PO construction, following the prediction of the inverse preference effect (Pickering & Ferreira, 2008). The picture description baseline results suggest that the preference for the use of the PO structure in the L3 is a consequence of cumulative exposure to the L2EP. The syntactic priming effects found for the DO/CVC-prime condition suggest that, if the exposure is switched to the L1CVC, there is the likelihood of greater use of the DO in the target language. In this sense, exposure to the L1CVC dative form may be more beneficial, in the long run, promote the development of the optimal representation of the target L3 English *default* dative construction, favoring an approximation to the pattern exhibited by native speakers. This does not mean, however, that the use of the L1CVC should dominate pedagogical practices. On the contrary, the L1CVC should be used judiciously, for clarification purposes, in order to encourage independent use of the target language (the same principle applies to the L2EP).

**Implication 2:** In EFL as well as in other subjects, the L1CVC can be useful to build confidence among learners whose L2EP is not fully developed

In the Cape Verdean educational context, while most students would feel more comfortable using the L1CVC, when in the classroom, they are constrained by the government-imposed conventions of the Cape Verdean educational system to use the L2EP. As a result of the comparatively lower status of the L1CVC, students who demonstrate a good mastery of the L2EP (especially if they have a native-like pronunciation) may receive a certain degree of prestige over those who do not demonstrate such skills. This situation may create an environment of intimidation, causing the less proficient students to feel embarrassed before their more proficient peers and before their teachers.

Pedagogically, such an atmosphere can be devastating for these students, since it promotes suspicious or negative attitudes towards their mother tongue (or reinforcing already suspicious or negative attitudes), which can be perceived as useless. This in turn, may upset the development of their identity with harsh consequences for their academic performance, since language, identity and linguistic attitudes are intimately connected (Lopes, 2016). Therefore, the use of the L1CVC as the language of instruction can reverse this entire picture, promoting positive attitudes which can lead to higher self-esteem and risk-taking in the language classroom as well as in the other school subjects and pedagogical practices.

**Implication 3:** The use of the L1 as language of instruction fulfills the UNESCO call (1953 and reinforced in 2003) for children to benefit from their mother tongue instruction

According to UNESCO's International Institute for Education Planning (2018, "Language of instruction", para. 1), "there is significant research evidence that children learn best when the first language of instruction is their mother tongue (L1)." In Cape Verde, the current government seems determined to engaging efforts to fulfill the Millennium

Development Goals (MDG) and the Sustainable Development Goals (SDG) determined by UNESCO. Paradoxically, however, the fact is that the subsequent governments in Cape Verde have been ignoring the fact that both the MDG and the SDG place a high importance on the issue of a quality and equitable education for all people in every layers of the society. Hence the findings of the present dissertation are expected to provide more subsidies towards a reformulation of educational policies in the country, based on the perception of the L1CVC as a viable language of instruction. However, there are some limitations inherent to the methodological designs of the studies reported in the present dissertation. The next section will point out these limitations and propose suggestions to overcome them in future research.

## 9.3 LIMITATIONS AND FURTHER RESEARCH

In this section I enumerate some limitations to the design and scope of the studies carried out in the present dissertation with the intent of preventing such constraints in future studies. In the sequence of each limitation identified, I provide some suggestions of topics that can be investigated in future studies dealing with language processing and acquisition in bilingual or multilingual contexts.

**Limitation1:** The syntactic interaction between L1CVC and L2EP was not investigated, assuming that the L2EP, for being an early language, has been proceduralized to a similar extent as the L1CVC

It would be interesting to investigate whether cross-linguistic syntactic priming also occurs from the L1CVC to L2EP in both directions for dative constructions. This would be an interesting research topic within cross-linguistic syntactic priming because so far, studies have privileged languages in which syntactic preferences in the target language are not so firm. The occurrence of syntactic priming effects between L1CVC and L2EP in either or both directions would provide evidence for contact-induced cross-linguistic syntactic priming favored by

cumulative changes in syntactic preferences and provide further support for the ecological validity of priming research.

**Limitation 2:** The *reason why* of the preference for the L2 remained elusive after the qualitative analysis to the open-ended answers to the biographical and language questionnaire

The present dissertation raised the question about the origins of the L2 EP preference (explicitly declared in the questionnaire by beginner L3 learners and implicitly observed in the intermediate L3 learners through their free descriptions of the dative pictures in the baseline condition that preceded the syntactic priming studies), but was uncapable of investigating it in a consistent manner through the qualitative analysis to the answers provided in the questionnaire. The lingering question is: does the preference for the PO structure reflect strategic alignment choice (Myers-Cotton, 1993; Auer, 1995) as a result of L2EP's higher prestige, or does it reflect automatic alignment processes (Kootstra, 2012) due to the daily exposure to the L2EP? In either case, can it be said that the PO bias seen in the questionnaire and in the baseline represent contact-induced language change as a result of cumulative exposure to L2EP?

**Limitation 3:** Dative constructions might not be as effective as relative clauses to investigate processing preference in structurally ambiguous constructions

The generalization made by Fernández (2003, 2005) that the human sentence processing mechanism operates in the same way, regardless of the stimulus language, was based on studies targeting relative clause (RC) attachment ambiguity. Ever since Cuetos and Mitchell (1988) discovered the uniqueness of RC structural ambiguity, RC attachments have had a long-standing reputable tradition among researchers interested in investigating processing preferences through structural ambiguities within and across languages (Fernández, 2005). Yet, due the inconveniences of using RCs (poorly studied in the L1CVC),

the present study used the dative alternation to show that processing strategies in the L3 can be mediated by either the L1 or the L2, depending on perceived structural similarities. It would be interesting to see how relative clause attachment ambiguity behaves in Cape Verdean Creole and between L1CVC/L2EP and L3English.

**Limitation 4.** The PDT results might have been affected by the fact that the stimuli were presented in written form, which could have led participants to activate the L2EP by association to its dominance in writing

In a future study, it would be more recommendable to test the PDT having subjects listen to stimuli instead of read it (e.g. Kootstra & Doedens, 2016). By the same token, data could be collected in a neutral environment (or in a natural setting) to prevent possible association between the school environment and the L2EP use.

## 9.4. FINAL REMARKS

To conclude, although the PO preference was shared by the two groups of participants, this preference was obfuscated by exposure to the L1CVC dative form in the three modalities tested. The results of all three studies show that the L1CVC mediates the processing of DO construcitons in the target language at both implicit and explicit levels, albeit more strongly at the implicit level.

It is my hope that the present dissertation will contribute to inform the theoretical discussion in each of the fields it proposed to, concerning the influence of previously learned languages on the processing and acquistion of a third language. I also trust that the groundword has been laid here to encourage future studies investigating the languages spoken in Cape Verde from a psycholinguistic perspective in an interface with the sociocultural factors that interact with mental representations.

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# APPENDIX A

Consent Form

**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**

## TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Convido-vos a participar do projeto de pesquisa intitulado **Transferência linguística na sala de aula de Inglês como Língua Estrangeira em Cabo Verde: um caso de facilitação ou interferência**? (*Language Transfer in the EFL Classroom in Cape Verde: A case of facilitation or interference?*). A pesquisa insere-se no âmbito do projeto de tese de doutorado do estudante Jair Gonçalves Martins e é orientado pela Professora Doutora Roberta Pires de Oliveira. Você foi selecionado por ser aluno da Escola Básica SOS na faixa etária situada entre 9 e 11 anos.

### Objetivos

O objetivo dessa pesquisa é investigar a relação entre a memória linguística e uso de duas línguas em simultâneo (Crioulo com Ingles; e Portugues com Ingles). Estudos mostram que os bilingues têm maior capacidade de retenção de informação linguística do que os monolingues, pois os bilingues estão mais acostumados a ao exercício de inibição e activação das línguas que possuem em diferentes momentos para fins comunicativos. Só que durante esse processo poderão ocorrer interferências de uma língua para a outra (geralmente da mais dominante para a menos dominante), que pode resultar em perda de informação. O projeto intitula-se "***Cross-linguistic influence in the EFL classroom*" (Transferencia linguística na sala de aula de inglês)** e é orientado pela Professora Doutora Roberta Pires de Oliveira do Programa de Pós-Graduação em Inglês (PPGI) da UFSC. Os resultados do presente estudo podem originar uma nova abordagem no Ensino do Inglês como Língua Estrangeira em Cabo Verde dando especial foco à relação entre bilinguismo e memória. O projeto é financiado pela CAPES, dentro do Programa de Incentivo à Formação de Estudantes de Cabo Verde.

Os pesquisadores se comprometem a cumprir os termos da Resolução CNS 466/12 e suas complementares.

**Procedimentos**

Será solicitado que você realize as seguintes atividades: 1) duas tarefas de leitura auto-monitorada e duas tarefas de descrição de imagem em ingles para aprendizes com nível intermediário de proficiência em ingles; 2) o preenchimento de um questionário e a realização de uma tarefa de tradução.

Todos os detalhes serão explicados antes das tarefas que acontecerão em local e horário marcados previamente e serão aplicadas pelo próprio pesquisador.

**Riscos e benefícios**

A participação na presente pesquisa não envolve riscos de alto nível, mas há a possibilidade do surgimento de ansiedade e nervosismo, inerentes a qualquer evento que simule uma situação de teste. Para evitar tais sentimentos, sessões de prática serão feitas antes da aplicação de cada teste para que você possa se familiarizar com os procedimentos e eliminar quaisquer dúvidas.

No final da pesquisa, o pesquisador irá mostrar as conclusões tiradas a partir dos resultados das atividades e dará sugestões que possam a ajudar futuramente em seus estudos.

**Confidencialidade**

Os resultados serão publicados, porém, nenhuma informação pessoal sua ou do(a) seu/sua filho(a) constará nos resultados, mantendo-se assim sua confidencialidade. Apenas o pesquisador e a orientadora terão acesso aos dados coletados antes dos mesmos serem preparados para publicação.

A participação ou não participação nessa pesquisa não afetará a sua relação com a instituição onde a pesquisa é realizada. A escolha de participar na pesquisa deve ser feita livremente por você. Além disso, você pode desistir da pesquisa a qualquer momento por qualquer motivo. Quaisquer dúvidas podem ser tiradas com o pesquisador através do e-mail jmartins1508@gmail.com

Esse documento deverá ser assinado em duas vias, ficando uma com você e outra com o pesquisador. Assinando o Consentimento Pós-Informação abaixo, você estará consentindo com o uso dos dados coletados para a pesquisa. Muito obrigado.

**Florianópolis, _____ de _____ de 2016.**

| | |
|---|---|
| _____ | _____ |
| Jair Gonçalves Martins | Roberta Pires de Oliveira |
| Pesquisador | Orientadora |

**Consentimento Pós-Informação**

Eu, _____ (nome completo) declaro que fui esclarecido sobre a pesquisa "***Cross-linguistic influence in the EFL classroom*"** **(Transferencia linguística na sala de aula de inglês)** e concordo que os meus dados sejam utilizados para realização da mesma.

Data: _____/_____/_____

Assinatura: _____.

APPENDIX B

Biographical and Language Questionnaire

## QUESTIONÁRIO

Este questionário tem como objetivo obter informações sobre o seu perfil enquanto falante nativo do Crioulo Cabo-verdiano, variante da ilha de Santiago (CST) e de Português como segunda língua e aprendente de Inglês como língua estrangeira. É de fundamental importância o preenchimento do mesmo com informações verdadeiras.

**1. Informações pessoais (marque com X)**
Idade: _____ anos Sexo: Masc. _____ Fem. _____
Nacionalidade: Cabo-verdiana_____ Outra (por favor especifique):_____

**2. Você reside em Cabo Verde há pelo menos cinco anos? (marque com X)**
Sim _____ Não _____

2.1 Se respondeu "não", por favor informe há quanto tempo você reside em Cabo Verde.
_____
_____

**3. Com que idade você aprendeu a falar o crioulo Cabo-verdiano, variante da ilha de Santiago (CST)? (marque com X)**

0 a 5 anos _____ 6 a 11 anos_____ depois dos 12 anos_____

**4. Com que idade você aprendeu a falar o Português Europeu? (marque com X)**

0 a 5 anos _____ 6 a 11 anos_____ depois dos 12 anos_____

**5. Com que idade você aprendeu a falar o Inglês? (marque com X)**

0 a 5 anos _____ 6 a 11 anos_____ depois dos 12 anos_____

**6. Qual você pensa ser seu nível de proficiência nas línguas abaixo (marque com X):**

6.1 CST falado: Baixo ____ Médio _____ Alto _____
6.2 CST escrito: Baixo ____ Médio _____ Alto _____
6.3 Português Europeu falado: Baixo ____ Médio _____ Alto _____
6.4 Português Europeu escrito: Baixo ____ Médio _____ Alto _____
6.5 Inglês falado: Baixo ____ Médio _____ Alto _____
6.6 Inglês escrito: Baixo ____ Médio _____ Alto _____

**7.Você utiliza o CST na escrita no cotidiano? Se sim, em que situações?**
_____
_____
_____
_____

**8.Você acha que o CST pode ajudar na aprendizagem do inglês? Justifique.**

_____
_____
_____
_____

**9. Em média, quantas horas por dia você tem contacto com o CST escrito? E com o Português?**

_____
_____
_____

**10. Se for preciso usar uma língua para ajudar a compreender ou escrever algo em inglês, que língua você preferiria usar? O CST ou o Português? Justifique.**

_____
_____
_____
_____

**OBRIGADO PELA SUA COLABORAÇÃO!**

# APPENDIX C

C1: Prime sentence –Target verb prompts for Study I (PDT)

L1-L3

| **Prime sentences** | **Target verb prompts** |
|---|---|
| Léna dâ Lulú um bistídu nóbu. | bring |
| Bia bendi Zé um Kolera. | build |
| Mizé fasi Sara bolu. | give |
| Carlita bêndi Lúcia um bluza bunito. | make |
| Sara fâzi minis um bolo. | show |
| Lú mánda Tó festa. | return |
| Tito dâ Mayra si viola. | read |
| Carla oferêsi Joana ajuda. | sell |
| Teté fasi Kátia árvi Natal. | offer |
| Jorge dâ Rosinha um prizenti. | pass |
| Adivogádu lê si kliente kontrátu. | bring |
| Carlos bendi Paulo computador. | build |
| Arkitétu fazi si mai um kása nóbu. | show |
| Rui mostra Sara anel di kasamentu. | make |
| Mayra longa Tito si microfone. | show |
| Minis pidi Júlia kumida. | return |
| Naná trazi Vando kadérnu. | build |
| Netxa mánda André um bola. | give |
| Ntóni kumpra Suzy um pulsera. | read |
| Nuno konstrui Toni kása. | offer |
| Jugador pása si kolega toadja. | sell |
| Nina fasi Zabel bolu aniversáriu. | pass |

L2-L3

| **Prime sentences** | **Target verb prompts** |
|---|---|
| A Joana deu um lenço à Paula. | bring |
| A Kátia trouxe presentes para a Sara. | build |
| A Lúcia vendeu o seu apartamento à Carla. | give |
| A Rita mostrou o anel ao Nuno. | make |
| O menino deu um recado ao Pedro. | show |
| O Miguel ofereceu o microfone à Amália. | return |
| A Suzy vendeu um relógio para o Pedro. | read |
| A Irene ofereceu um quadro à Carla. | sell |
| O Carlos leu um bilhete à Maria. | offer |
| O Jorge dedicou um fado à Isabel. | pass |
| O arquiteto construiu uma casa nova à família. | bring |

| | |
|---|---|
| O capitão passou a taça aos companheiros. | build |
| A Isabel dedicou uma canção à mãe. | show |
| O Paulo deu um chapéu ao Nélson. | make |
| A Beatriz vendeu um vestido à Maria. | show |
| O Manuel mostrou o relógio à Joana. | return |
| O patrão deu um aumento ao empregado. | build |
| A professora leu livro ao aluno. | give |
| A Sara comprou uma boneca à Carmen. | read |
| A Simone passou o copo ao marido. | offer |
| O Rui dedicou um poema à Elsa. | sell |
| O Francisco devolveu o dinheiro ao chefe. | pass |

C2: Prime-Target sentences for Study II (SPRT)

L1-L3

| Prime2 | Target |
|---|---|
| Tóni\|dâ\|Djósa\|un\|bóla. | Kathy\|sold\|Phillip\|a\|pencil. |
| Zéza\|longa\|Mánu\|un\|kárta. | Brenda\|rented\|Charles\|her\|laptop. |
| Lóla\|fâsi\|Bétu\|un\|bôlu. | Alex\|granted\|Kathy\|her\|paycheck. |
| Carlos\|bendi\|Paulo\|un\|káru. | Mary\|offered\|July\|a\|puppy. |
| Néta\|fâsi\|Bétu\|un\|kálsa. | Sally\|handed\|Martha\|the\|dishes. |
| Júlio\|mostra\|Méno\|si\|bóla. | Anna\|promised\|Cindy\|a\|tablet. |
| Jorge\|dâ\|Julia\|um\|lénsu. | Daniel\|lent\|Sally\|his\|camera. |
| Káku\|longa\|Táni\|un\|prátu. | Michael\|offered\|Helen\|some\|cookies. |
| Tóia\|mostra\|Djoni\|un\|pásu. | Parker\|handed\|Jordan\|the\|basket. |
| Tuja\|bendi\|Jorge\|un\|livru. | Martha\|granted\|Alex\|an\|upgrade. |
| Paula\|manda\|Xétu\|un\|térsu. | Charlie\|promised\|Daniel\|a\|contract. |
| Tina\|mostra\|Zito\|un\|bárku. | Mike\|rented\|Sally\|a\|building. |
| Táni\|longa\|Jorge\|un\|xikra. | Thomas\|handed\|Jessie\|a\|ruler. |
| Bétu\|dâ\|Suzi\|un\|bêju. | Ashley\|sent\|Abby\|a\|postcard. |
| Djoni\|mostra\|Tóia\|un\|lóka. | Tony\|granted\|Ethan\|a\|favor. |
| Tuka\|longa\|Mito\|un\|gárfu. | Michael\|promised\|Helen\|a\|present. |
| Djonsa\|fâsi\|Néta\|un\|mésa. | Peter\|rented\|Cindy\|a\|bedroom. |
| Tóni\|manda\|Jorge\|un\|móta. | Ethan\|handed\|Thomas\|a\|bottle. |
| Suzi\|dâ\|Lóla\|un\|gátu. | Robert\|brought\|Doris\|a\|message. |
| Mito\|bendi\|Tuka\|si\|pránxa. | Andy\|rented\|William\|a\|racehorse. |
| Zito\|mánda\|Tina\|un\|móvel. | Jessie\|granted\|Thomas\|the\|money. |
| Paulo\|fâsi\|Júlio\|un\|bérsu. | Rachel\|offered\|Kevin\|a\|sweater. |
| Djóni\|bendi\|Mánu\|un\|káma. | Abby\|promised\|Phillip\|her\|beetle. |
| Júlia\|mánda\|Nita\|un\|jóia. | David\|offered\|Lucy\|a\|sandwich. |

L2-L3

| Prime2 | Target |
|---|---|
| O\|Bruno\|deu\|a\|bola\|ao\|Pedro. | The\|salesman\|sold\|a\|pencil\|to\|Kathy. |
| A\|Laura\|passou\|o\|copo\|à\|Marta. | The\|owner\|rented\|a\|bedroom\|to\|Samuel. |
| A\|Yara\|serviu\|o\|leite\|ao\|Hugo. | The\|lawyer\|granted\|a\|contract\|to\|Johnny. |
| O\|Igor\|comprou\|o\|rádio\|ao\|João. | The\|worker\|offered\|an\|armchair\|to\|Mary. |
| O\|Nelson\|mandou\|um\|pôster\|à\|Júlia. | The\|cleaner\|handed\|the\|towels\|to\|Sally. |
| A\|Marta\|deu\|um\|cesto\|à\|Bruna. | The\|agent\|lent\|some\|money\|to\|Richard. |
| O\|Rúben\|mostrou\|o\|carro\|ao\|Chico. | The\|hostess\|promised\|her\|silence\|to\|Peter. |
| A\|Vera\|passou\|o\|garfo\|à\|Carla. | The\|woman\|offered\|a\|blanket\|to\|Daniel. |
| O\|Jaime\|mostrou\|a\|mota\|ao\|Ivo. | The\|waitress\|handed\|the\|sandwich\|to\|Michael. |
| O\|Pedro\|comprou\|o\|fato\|ao\|Paulo. | The\|players\|granted\|the\|title\|to\|Chelsea. |
| A\|Carla\|mandou\|a\|carta\|ao\|Nilton. | The\|chairman\|promised\|an\|upgrade\|to\|Susan. |
| O\|Jorge\|mostrou\|um\|barco\|ao\|Fábio. | The\|landlord\|rented\|his\|mansion\|to\|Robert. |
| O\|Hugo\|deu\|o\|lote\|à\|Júlia. | The\|broker\|sent\|a\|letter\|to\|Thomas. |
| A\|Sara\|serviu\|um\|lanche\|ao\|Lucas. | The\|athlete\|handed\|the\|bottle\|to\|Kathy. |
| O\|Chico\|comprou\|a\|casa\|à\|Sílvia. | The\|student\|rented\|a\|laptop\|to\|Mary. |
| A\|Rosa\|passou\|o\|prato\|ao\|Nélson. | The\|doctor\|promised\|a\|treatment\|to\|Susan. |
| O\|Sérgio\|serviu\|a\|mesa\|à\|Marta | The\|dealer\|rented\|a\|beetle\|to\|Jessie. |
| O\|Nilton\|mandou\|um\|beijo\|à\|Carla. | The\|waiter\|handed\|a\|tea-cup\|to\|Thomas. |
| A\|Laura\|deu\|um\|gato\|ao\|João.. | The\|postman\|brought\|a\|postcard\|to\|Susan. |
| O\|Marco\|serviu\|um\|sumo\|ao\|Rúben. | The\|chairman\|promised\|a\|paycheck\|to\|Jordan. |
| O\|Nuno\|passou\|a\|folha\|ao\|Pedro. | The\|banker\|granted\|the\|credit\|to\|Ashley. |
| O\|César\|mostrou\|a\|marca\|à\|Ema. | The\|helper\|offered\|a\|coffee\|to\|Brenda. |
| O\|João\|comprou\|o\|carro\|à\|Rosa. | The\|teacher\|promised\|a\|lesson\|to\|Cindy. |
| O\|Vítor\|mandou\|um\|tablet\|à\|Sara. | The\|butcher\|offered\|a\|hotdog\|to\|Thomas. |

C3: Translation task for Study III

**TRANSLATION TASK#1 (L2-L3)**

**TRADUÇÃO – PORTUGUÊS - INGLÊS**

**Por favor traduza para o inglês a seguinte conversa. A tradução não precisa ser ao pé da letra, mas tente mantê-la fiel ao conteúdo. É permitido o uso de dicionário. Qualquer dúvida, por favor solicite assistência do pesquisador.**

**Marta:** Ontem eu dormi cedo e não assisti a telenovela das nove. O que de relevante aconteceu?

**Patrícia:** Foi espetacular, amiga. O Pedro ofereceu uma jóia à Joana. Um anel de rubi! A seguir os dois se beijaram, e a Francisca viu tudo. A Francisca contou a cena à Júlia. A Júlia ficou furiosa!

**Kátia:** Sim. Depois a Júlia e a Joana se encontraram por acaso no shopping. A Joana mostrou o anel à Júlia, só para lhe provocar. As duas começaram a discutir e a agredir-se mutuamente até que um segurança do shopping interviu e as separou.

**Teresa:** E o Pedro enviou uma encomenda suspeita ao Tiago. Acho que era uma bomba.

**Patrícia:** É capaz de ser droga. Eu acho que o Pedro pretende incriminar o Tiago, não matá-lo. Acho que o Pedro não seria capaz de matar alguém.

**Marta:** Claro que seria! Não te lembras daquela vez que o Pedro deu bebida envenenada ao Joaquim?

**Patrícia:** Mas não foi para matá-lo. Se fosse para matar ele teria aumentado a dose.

**Teresa:** Não sei meninas. O Pedro sempre mostra duas caras aos telespectadores. Ele é muito misterioso. Não sei se ele é um verdadeiro vilão, mas sei que não é um benfeitor.

**Kátia:** Mas quanto à Joana não tenho dúvidas. Ela é uma vilã!

**Patrícia:** Sim. A Joana revela a sua verdadeira personalidade aos telespectadores. Ela nunca escondeu que é uma vilã.

**Marta:** E como o Pedro gosta da Joana, ele também pode ser um vilão.

**Teresa:** Eu não acho que o Pedro gosta da Joana.

**Marta:** Ó Teresa, o Pedro deu um anel de rubi à Joana! É óbvio que ele gosta dela.

**Teresa:** Não sei. Como disse o Pedro é muito misterioso. Temos que esperar para ver o que acontece nos próximos capítulos.

**TRANSLATION TASK#2 (L1-L3)**

**TRADUSON – CST – INGLÊS**

**Pur favôr tradúzi kel siguinti konberso li pa inglés. Traduson ka mesti ser feto letra pa letra, más é debi ser fiel a kontiúdo original. É permitido utilizason di disionário. Kualker dúvida, pur favôr pidi asisténsia di pisquizador.**

**Marta:** Ónti N-durmi sédu nka odja nuvéla. Kusé ki kontisi di importánti?

**Patrícia:** Stába spetáklu, amiga. Pedro oferesi Joana un jóia. Un anel de rubi! Dipos es dâ bêju, y Francisca odja tudo. Francisca konta Júlia séna. Júlia fica xatiádu!

**Kátia:** Sim. Dipôs Júlia ku Joana inkontra por akázu na shopping. Joana mostra Júlia anel só pa provoca-l. Ês komesa ta diskúti y ta agridi kumpanhero ti ki un siguránsa di shopping entra na meio pa sipará-s.

**Teresa:** Tambê, Pedro mánda Tiago un inkuménda suspeito. Parsem mê bomba.

**Patrícia:** Ê kapás di ser droga. Parsem ma Pedro kre inkrimina Tiago. Ê ka kre mata-l. Parsem ma Pedro ka ta serba kapáz di mata ningém.

**Marta:** Kláru kê ta serba. Bu ka ta lembra di kel bês ki Pedro dâ Joaquim un bibida envenenádo?

**Patrícia:** Más ka foi pa mata-l. Si éra pa mata-l el ta aumentába dóza.

**Teresa:** N-ka sabi, minis. Pedro sémpri ta mostra dôs róstu. El é misteriozo dimás. N-ka sabi si el é un verdadêro vilon, mas N-sabi ma el é ka bom algém.

**Kátia:** Más kuanto a Joana N-ka tem dúvida. El é ka bali.

**Patrícia:** Sim. Joana dja mostra si personalidádi. Nunka é ka sukundi ma el é runha.

**Marta:** Y komu Pedro gosta di Joana, el tambê é podi ser runho.

**Teresa:** N-ka ta átxa ma Pedro gosta di Joana.

**Marta:** Ô Teresa, Pedro dâ Joana un anel di rubi! É  kláru k'ê gosta del.

**Teresa:** N-ka sabi. Sima djan flâ, Pedro é misteriozo dimás. Nu ten ki spéra pa nu odja kuzê ki ta kontisi na kes prósimo kapítulo.

# APPENDIX D

ALUPEC – Alfabeto Unificado para a Escrita do Cabo-Verdiano ("A Unified Alphabet for the Writing of Cape Verdean Creole")

DECRETO-LEI nº 67/1998. "Bases do Alfabeto Unificado para a Escrita do Crioulo Cabo-verdiano", Boletim Oficial – 5º Suplemento, 48, 31 de Dezembro, 19-23.

**Artigo 2º**

**Letras e Dígrafos 1.**

1. O Alfabeto Cabo-verdiano integra vinte e quatro letras e quatro dígrafos, devendo a ordem das letras figurar antes dos dígrafos.

2. As letras, em maiúsculas e minúsculas, são as seguintes:

    a) Maiúsculas A B D E F G H I J K L M N Ñ O P R S T U V X Y Z

    b) Minúsculas a b d e f g h i j k l m n ñ o p r s t u v x y z

3. Os dígrafos, em maiúsculas e minúsculas, são os seguintes:

    a) Maiúsculas DJ LH NH TX

    b) Minúsculas dj lh nh tx