

CROSSLINGUISTIC INFLUENCE IN MOTION EVENT PROCESSING: A SELF-PACED READING PILOT STUDY OF L1-PORTUGUESE/L2-ENGLISH BILINGUALS

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1. INTRODUCTION

This paper presents a pilot study¹, the first phase of my ongoing postdoctoral research on conceptual transfer—a phenomenon at the intersection of second language acquisition (SLA) and the linguistic relativity hypothesis (LRH). The LRH posits that language can influence speakers' perception, attention, memory and expression (Pavlenko, 2014). In bilinguals, that means that the conceptual structure of a language can affect the use of another language, a phenomenon known as conceptual transfer (Jarvis; Pavlenko, 2010). A key domain for investigating this is motion events, where typological differences between languages can make speakers attend to and express distinct elements of an event.

In Talmy's (2000) typology of motion event lexicalization, languages are divided into two types: satellite-framed (S-languages) and verb-framed (V-languages). English, an S-language, encodes MANNER of motion in the main verb and PATH in a verbal satellite (e.g., running across the street). By contrast, Portuguese, a V-language, typically encodes PATH in the main verb, with MANNER being optional and expressed in an adjunct (e.g., atravessar a rua correndo). These typological differences can lead to significant challenges for L2 learners, as they must restructure their mental representations to accommodate a new lexicalization pattern in their L2².

Research has shown that L1 patterns can influence L2 production, particularly in typologically distinct languages. L1 speakers of V-languages like Spanish and Portuguese often transfer their native path-focused constructions into their L2 English (Cadierno, 2010; Ferreira, 2023). L2 proficiency can also reshape speakers' conceptual patterns in their L1 (Hohenstein; Eisenberg; Naigles, 2006).

In my PhD study (Ferreira, 2023), I found that L1-Portuguese speakers expressing motion in L2 English used three different patterns. The first, the target S-language pattern, follows the English norm, encoding MANNER in the verb and PATH in a satellite (e.g., He jumped into the elevator). The second, the V-language pattern, reflects Portuguese structure, with PATH in the verb and MANNER in an adjunct (e.g., He entered the elevator jumping). The third, a hybrid pattern, combined elements of both languages, using a dummy verb (e.g. *get* or *go*) along with a satellite to express PATH, but adding a gerund to indicate MANNER (e.g., He got into the elevator jumping). More proficient L2 speakers used the S-language pattern more often than the V-language pattern. The hybrid pattern was the least frequent, and more commonly found in the production by the intermediate and advanced L2 speakers of English.

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² In this paper, L2 refers to any language learned about the mother tongue(s), and the L2 English of the participants of this study learned it as foreign language, with formal instruction.

Building on these findings, the present research shifts focus from the production of motion event descriptions to the real-time processing of lexicalization patterns using a self-paced reading (SPR) paradigm. While previous studies have primarily focused on offline production tasks, this study examines how crosslinguistic influence and L2 proficiency affect the processing costs of different motion event patterns in L2 English. By exposing L1-Portuguese/L2-English bilinguals to sentences featuring the three patterns identified by Ferreira (2023) – S, V, and H – the study seeks to understand how these factors impact real-time sentence processing. Specifically, it asks:

1. Do L2 speakers of English show differences in processing time across the different motion event lexicalization patterns (S, V, and H)? If so, which patterns are processed more quickly?
2. Does proficiency in L2 English modulate how these different lexicalization patterns are processed?
3. Can the self-paced reading (SPR) paradigm effectively capture differences in the processing of motion event lexicalization, and what improvements are necessary before the full-scale study?

2. METHOD

Forty-six bilingual participants were recruited through convenience sampling. Most participants had previously taken part in the PhD study conducted in 2022–2023 (Ferreira, 2023), with a few additional participants referred by others who had completed the earlier study. To be eligible, participants had to be Brazilian with Portuguese as their only L1 and demonstrate at least basic reading skills in L2 English. Participation was limited to those currently living in Brazil.

The experiment employed a self-paced reading (SPR) task with a stationary-window, word-by-word presentation. Participants controlled the pace of reading by pressing a key to reveal each successive word. Reaction times (RTs) for each word were recorded, and the RTs for words belonging to the same concept (FIGURE, MANNER, PATH, GROUND) were summed to calculate the total RTs for each concept in each sentence. These were used as the dependent variable, reflecting real-time processing of different motion event components.

The stimuli included 267 experimental sentences organized into 89 triplets. Each triplet expressed a motion event through three different lexicalization patterns:

- S-pattern (satellite-framed): Manner of motion encoded in the main verb and path in the satellite (e.g., Lisa crawled up the hill).
- V-pattern (verb-framed): Path in the main verb and manner expressed in an adjunct (e.g., Lisa climbed the hill crawling).
- H-pattern (hybrid): A dummy verb encoding path, with manner provided by a gerund (e.g., Lisa went up the hill crawling).

To create the sentences, we selected 23 manner verbs from the English Vocabulary Profile³ and included a range of proficiency levels (A1-C1) to reflect the expected linguistic abilities of the participants. Five path satellites were used (in, out, up, down, across), paired with equivalent path verbs (enter, leave, climb, descend, cross). Dummy verbs (go, get) were used in the sentences with the H pattern. The sentences were checked and proofread by native speakers.

The sentences were distributed across three counterbalanced lists. Using R, sentences were randomly assigned so that each list contained 89 experimental sentences—one sentence per triplet per list—and an equal distribution of the three

³ <https://www.englishprofile.org/>

lexicalization patterns. Each list also included 20 filler sentences (non-motion-related sentences with similar structures) and 37 yes/no comprehension questions. A minimum comprehension accuracy rate of 80% was set as a threshold, ensuring that participants understood the experimental sentences and remained attentive during the task.

Participants accessed the study via a link provided to them and were instructed to complete it on a computer in a quiet environment. The first screen presented participants with a free and informed consent form, which they had to accept to proceed. Participants then completed a brief demographic questionnaire, which was programmed in Pavlovia Surveys⁴ and included questions about age, gender, education, handedness, self-reported L2 proficiency, and additional language fluency.

Following the demographic questionnaire, participants were given instructions for the self-paced reading task, which was followed by four practice trials. The SPR task was programmed in PsychoPy (Peirce *et al.*, 2022) and hosted online on Pavlovia⁵. During the task, sentences were presented one word at a time in the center of the screen, and participants advanced by pressing the space bar. A one-second fixation point appeared between each sentence, and three breaks were built into the session to prevent fatigue. The entire procedure took between 15 and 20 minutes to complete.

3. RESULTS AND DISCUSSION

Of the 46 participants initially recruited, data from 37 participants were retained for analysis. Nine participants were excluded due to either failing to meet the 80% accuracy threshold on the comprehension questions or exhibiting unusually long reaction times (RTs), suggesting potential distractions during the task. The final sample had a mean age of 31.1 years (SD = 6.99), with 14 men, 20 women, and one non-binary participant. All participants were either enrolled in higher education or had already completed a university degree.

The self-paced reading data were analyzed using linear mixed-effects models to assess the impact of the three motion event lexicalization patterns (S, V, H) on reaction times (RTs) for L2-English speakers. The model also included factors such as the linguistic concept (MANNER, PATH, GROUND), word frequency, word length, trial index and participants' proficiency levels. Main findings:

- I. **Lexicalization patterns:** Participants showed significant differences in processing times across the three lexicalization patterns. The S-language pattern resulted in faster reading times than the H-patterns, which in turn was read more quickly than the V-pattern. Pair-wise comparisons revealed that the difference between the S and V patterns was statistically significant ($p = 0.03$), suggesting that the target English pattern (S) is processed more efficiently than the non-target patterns (V and H).
- II. **Conceptual categories:** There were notable differences in how participants processed different conceptual categories (MANNER, PATH, GROUND). MANNER showed the longest RTs in the V and H conditions, likely due to their position at the end of the sentence, which is known to trigger wrap-up effects. Although the end-of-sentence MANNER RTs in the V and H conditions were longer than the end-of-sentence GROUND RTs in the S condition, it is difficult to conclude whether this reflects a longer processing time for MANNER in those conditions or simply the influence of wrap-up effects.

⁴ <https://pavlovia.org/docs/surveys/overview>

⁵ <https://pavlovia.org/#about>

- III. **Effect of proficiency:** Proficiency did not significantly modulate processing across all conditions. However, a trend suggested that participants with higher self-reported proficiency in English processed the S-pattern slightly faster than those with lower proficiency. This effect was not statistically significant but points to potential crosslinguistic influence from L1-Portuguese.

These results suggest that L2-English speakers process motion events more efficiently when they conform to the target English (satellite-framed) pattern. This aligns with previous findings on crosslinguistic influence, where L1 speakers of verb-framed languages like Portuguese exhibit difficulty fully adapting to the satellite-framed structure of L2 English. Additionally, the hybrid pattern's intermediate processing speed indicates that L2 speakers may employ a crosslinguistic strategy that blends elements of both L1 and L2 lexicalization patterns and suggest an intermediate stage in the restructuring of mental representations of language-mediated motion concepts.

4. CONCLUSIONS

The pilot study showed that the self-paced reading task effectively captured processing differences across motion event lexicalization patterns, validating its utility for the main study. It also helped identify several methodological improvements. For the full study, we will add a final phrase to the stimuli sentences to better control for wrap-up effects, introduce a vocabulary test as a more objective measure of L2 proficiency, and conduct the task in a lab setting to ensure better control over environmental conditions. These changes will strengthen the reliability and precision of the findings in the upcoming, larger-scale experiment.

5. REFERENCES

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