

Recursion is a feature of language where syntactic structures are embedded under categories of the same type (Sauerland & Gartner, 2007). Learning these structures has proven difficult for children (Roeper, 2011; Pérez-Leroux et al., 2012). While there is no general delay for simultaneous bilinguals (Amaral & Leandro, 2017), adult L2 speakers lag in their performance with recursive structures. Limbach and Adone (2010) investigated intermediate German learners of English who have difficulties with recursive possessives (Mia’s dad’s bike). Even though simple (non-recursive) possessive -s exists in German, L2 learners were unable to generalize it to recursive configurations. Nelson (2016) tested comprehension of PP recursion for Spanish and English L1 and L2 speakers. Advanced and native speakers performed similarly in both languages, preferring recursive over conjunctive interpretations. However, intermediate L2 Spanish speakers lagged in their choice of recursive interpretation for two levels of PP stacking. This difference was higher for three levels even though both languages had the same patterns.

Our study explores the production of English recursive nominal structures among Mandarin and Spanish L2 learners of English. Crucially, the three languages differ in terms of branching directionality, or where in relation to the head noun the modifiers are located. Spanish noun phrases (NPs) are uniformly right-branching (RB), Mandarin NPs are uniformly left-branching (LB), and English has mixed directionality, as illustrated by the position of possessors in contrast to prepositional phrases (PPs) and relative clause modifiers.

Fifteen Spanish and twenty-one Mandarin speakers participated in this study. Participants were invited to describe images that were designed to elicit a recursively structured sentence. Both Spanish and Mandarin speakers produced a variety of alternative sentences when prompted. Some of these sentences differed from the target English sentence in terms of the errors produced while conveying the different noun levels.

### Examples:

#### PP overgeneration

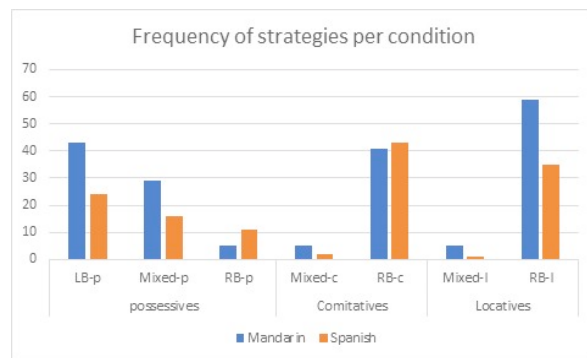
1. “The backpack of the friend of Dora” (L1 Spanish)  
Target: “Dora’s friend’s bag.”

#### Additional clauses

2. “The monkey that is holding the clown’s hand, his balloon blew up” (L1 Mandarin)  
Target: “The clown’s monkey’s balloon.”

#### Flattening Embedded structures

3. “The dog that’s near the house and under the tree is barking.” (L1 Mandarin)  
Target: “The dog next to the tree next to the house.”



Although there were no significant differences in age of onset, levels of English exposure or self-rating of English language abilities, the Mandarin L1 group was significantly better at producing target responses than the Spanish L1. Overall, Spanish speakers had preference for RB structures over LB structures or mixed productions, whereas Mandarin speakers had an overall preference for LB structures over RB and mixed productions. The difference in the distribution of responses was significant ( $X^2 = 3.668, p = 0.0554$ ). As figure 1 shows, the primary difference between the groups emerges with recursive possessives, where Mandarin speakers produced many more left branching and mixed responses. The three conditions can be seen in figure 1; possessive (see target exp. 1), comitatives (using “with”), and locatives (see target exp. 2). Spanish speakers often produced atypical PP structures in possessive contexts, such as in example 1 above.

This supports the congruence hypothesis that L2 speakers would perform better with recursive structures that are congruent with the branching directionality in their L1.

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