EXTENDING THE GROWING TREES HYPOTHESIS: THE ROLE OF STRUCTURAL COMPLEXITY AND FEATURAL INTERVENTION IN OLDER CHILDREN'S SYNTACTIC DEVELOPMENT

INTRODUCTION: The Growing Trees Hypothesis (GTH), proposed by Friedmann et al. (2021), offers a recent maturation-based approach to syntactic development. It posits that language acquisition is guided by the successive, bottom-up availability of three distinct clausal stages, cartographically defined (Fig.1), which are implicationally related. The GTH makes specific predictions about the developmental timeline of syntactic structures, as the presence or absence of a lower stage determines whether the structures associated with a higher one can be acquired. While the GTH has been primarily formulated to account for children in the very early stages of language acquisition – typically entering Stage 3 around 2;5 years – no study has yet explored whether older children's comprehension and production of syntactic structures remain sensitive to structural complexity, as defined by progressive stages. Investigating this question in older children also provides an opportunity to examine how syntactic complexity, operationalized in terms of stages, interacts with other sources of complexity, such as featural intervention, which has been shown to affect the acquisition of many left-peripheral structures (Adani et al. 2010; Bentea et al. 2016; Contemori & Belletti 2010; Rizzi 2018, among others).

THE DATA: We analyzed data from a repetition task performed by 42 Spanish monolingual children (age range: 4;4 - 7;1). The experimental sentences included the phenomena in Fig.2, which target different zones of the GTH. In developing the classification in Fig.2, we adapted Friedmann et al.'s (2021) original syntactic map to Spanish (Fig. 1) by positioning WhP (the landing site of wh-movement) as the structural boundary between zones 2 and 3, situated below FocP and above TopP in Spanish (Zubizarreta, 2012). Some phenomena depicted in Fig. 2, such as restructuring verbs (modal, aspectual, and motion verbs) and imperatives, were classified as TP-level phenomena, aligning with findings from recent acquisition studies (Sgrizzi, 2022; Rossi, 2023).

RESULT: We first ran a generalized linear mixed-effects model with accuracy (0 vs. 1) as the dependent variable, and the interaction between stage (1, 2, or 3) and age as predictors. The analysis revealed a significant effect of stage: children were less accurate with structures from stages 2 and 3 compared to stage 1, but no significant difference emerged between stages 2 and 3 (Fig. 3). Additionally, there was a significant main effect of age, with older children demonstrating higher accuracy overall. This age effect was particularly pronounced for stage 3 structures, as indicated by a significant interaction between age and stage (Fig. 4). Next, we conducted a separate analysis for structures at stages 2 and 3 to examine whether the presence or absence of intervention interacted with the stage of the structure. Without intervention, children were less accurate with stage 3 structures compared to stage 2, in line with the GTH. However, intervention negatively affected accuracy, especially for stage 2 structures (Fig. 5). While age had a main effect on accuracy, it did not interact significantly with stage or intervention presence. Notably, CLLDed objects with an intervening subject proved particularly challenging for the children.

DISCUSSION: The GTH offers a robust framework for understanding syntactic development not only in early childhood but also in older children. Structural complexity, as defined by the GTH zones, continues to shape syntactic computation beyond the early stages of acquisition. The observed effect of zone on accuracy confirms that higher zones are not only acquired later but also more challenging for older children. By validating the GTH across a broader age range, our study highlights the interplay between structural zones (particularly those in the CP-domain, zones 2 and 3) and featural intervention, offering a more comprehensive perspective on the maturation of syntax over time. Bridging the gap between early and later stages of acquisition, our findings underscore the importance of considering both structural (i.e., hierarchical) and featural complexity in syntactic development.

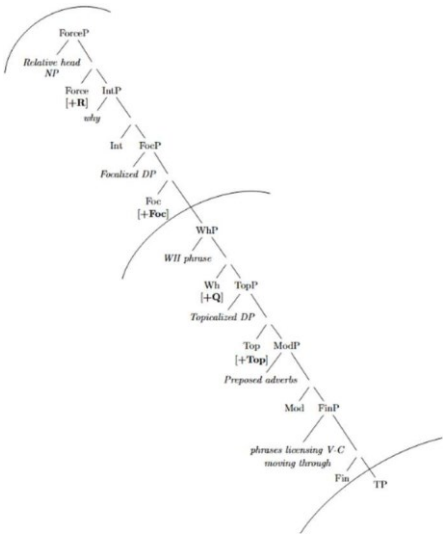

Figure 1: The Spanish LP and the GTH's 3 zones

FIELD	CATEGORIES
TP	locative PP, SV, SVO, adjective-noun agreement, locative adverb, temporal adverb, complex DPs, TP-coordination, copular sentence, demonstratives, infinitives in monoclausal structures, modal verbs, imperatives, post-verbal subjects, quantifiers, reflexive verbs, sentential negation, passive
LOW CP	preposed modifiers, bare-wh questions, CLLD
HIGH CP	causal complement, control, clausal comparatives, finite complements, clausal coordination, subject/object relatives, lexically restricted subject/object wh-questions (in HIGH CP following Rizzi 2018)

Figure 2: Coding of the syntactic structures of the repetition task and the relative GTH zones

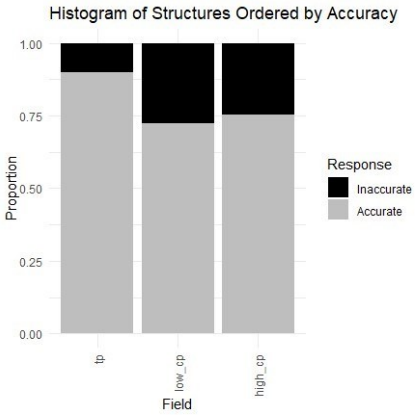

Fig. 3: Proportion of accurate repetitions across the three syntactic zones

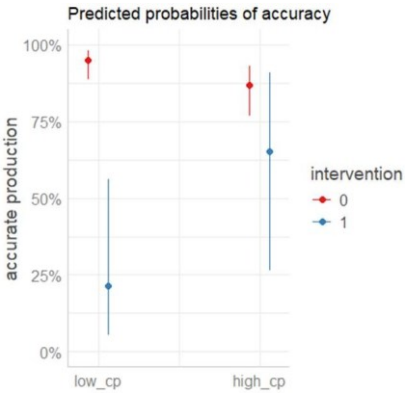

Fig. 5: Predicted probability of accurate repetition as a function of the syntactic structure zone and the presence (1) or absence (0) of intervention

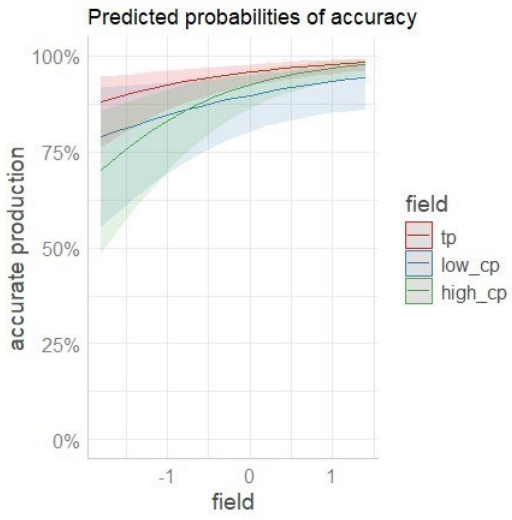

Fig. 4: Predicted probability of accurate repetition for each zone as a function of age (age values are centered).

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