Writing 1-to-3 digit numerals to dictation in Spanish: predictors and error analysis

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Mastering number transcoding demands from children the acquisition of the complexities of the Arabic place-value system and the specific rules of multi-digit numbers of their language. The present research explores the writing to dictation of 1-to-3-digit numerals in an initial sample of Spanish 1st (N = 208) and 2nd grade school children (N = 96). Language rules for multidigit numbers in Spanish are similar to those in other languages (e.g., Italian) with some variations: there are irregularities (e.g., inversion) between 11-15, but a regular pattern after this that involve both multiplicative and additive rules (432: cuatrocientos treinta y dos, literally: fourhundreds thirty and two"). Results indicated that 2nd grade children made anecdotical errors (< 2%), showing mostly digit substitution (lexical) errors (e.g., 167 instead of 567). First graders showed a more diverse pattern of errors (19%) with digit substitutions, syntactic errors and mixed errors. Qualitative analysis showed similar error rates for irregular and regular multidigits suggesting a non-syntactical treatment of these numbers. Within syntactic errors, we claim that transposition (107 instead of 170) and structural errors (10070 instead of 170) have different sources and involve different compensation mechanisms. Finally, in a subset of the data we also explored the role of non-symbolic comparison, number to mental line position and completion of numerical sequences in predicting number writing. Whereas completing Arabic numerical sequences arose as significant predictor, no role for variables related to the analogical representation of numbers was found. This seems to support asemantic models of transcoding.