

Analysis of phonological and morphological movement errors of deaf children in LSQ tasks

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Methods

Considering...

- the perception of similarities in signs sharing specified formal parameters (Hall *et al.*, 2012; Morford and Carlson, 2011; Hildebrandt and Corina, 2010; Poizner, 1983; Poizner and Lane, 1978; Lane *et al.*, 1976);
- that phonological movement is essential for the identification of a sign in ASL (Emmorey & Corina, 1990);
- that deaf children are able to perceive (identify, categorize and analyse) formal contrasts in LSQ, but, according to success rate, modification of movement is harder to perceive than location or handshape (Parisot *et al.* 2011)
- that studies point out that movement is hard to isolate from other constituents (Karnopp, 2002,) and to depict in psycholinguistic tasks (Di Perri, 2004), which can affect the interpretation of subjects' perception.

Production tasks

- Rectification**
Rectifying a false sign by manipulating a formal element
- Reconstitution**
Reconstituting a sign from an isolated formal element
- Permutation**
Permuting a formal element in order to produce a different sign

Statistical measures

- Friedman ANOVA test with Wilcoxon test
- Kruskal-Wallis test with Mann-Whitney test

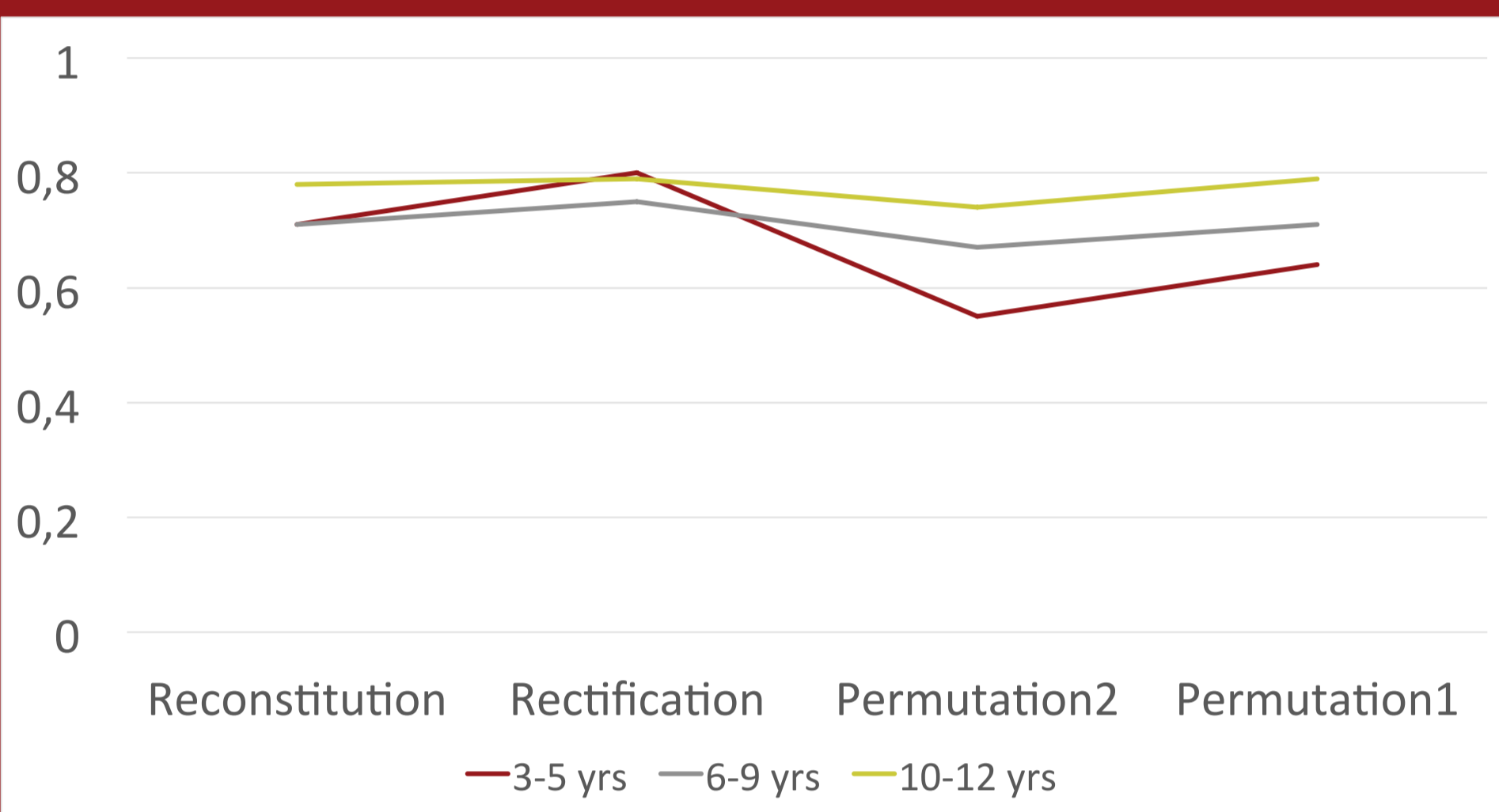
Subjects

- 3 groups of deaf children
- 3 to 5;11 6 to 9 9;5 to 12
- *Some retested for 2 (n=13) or 3 (n=7) successive years

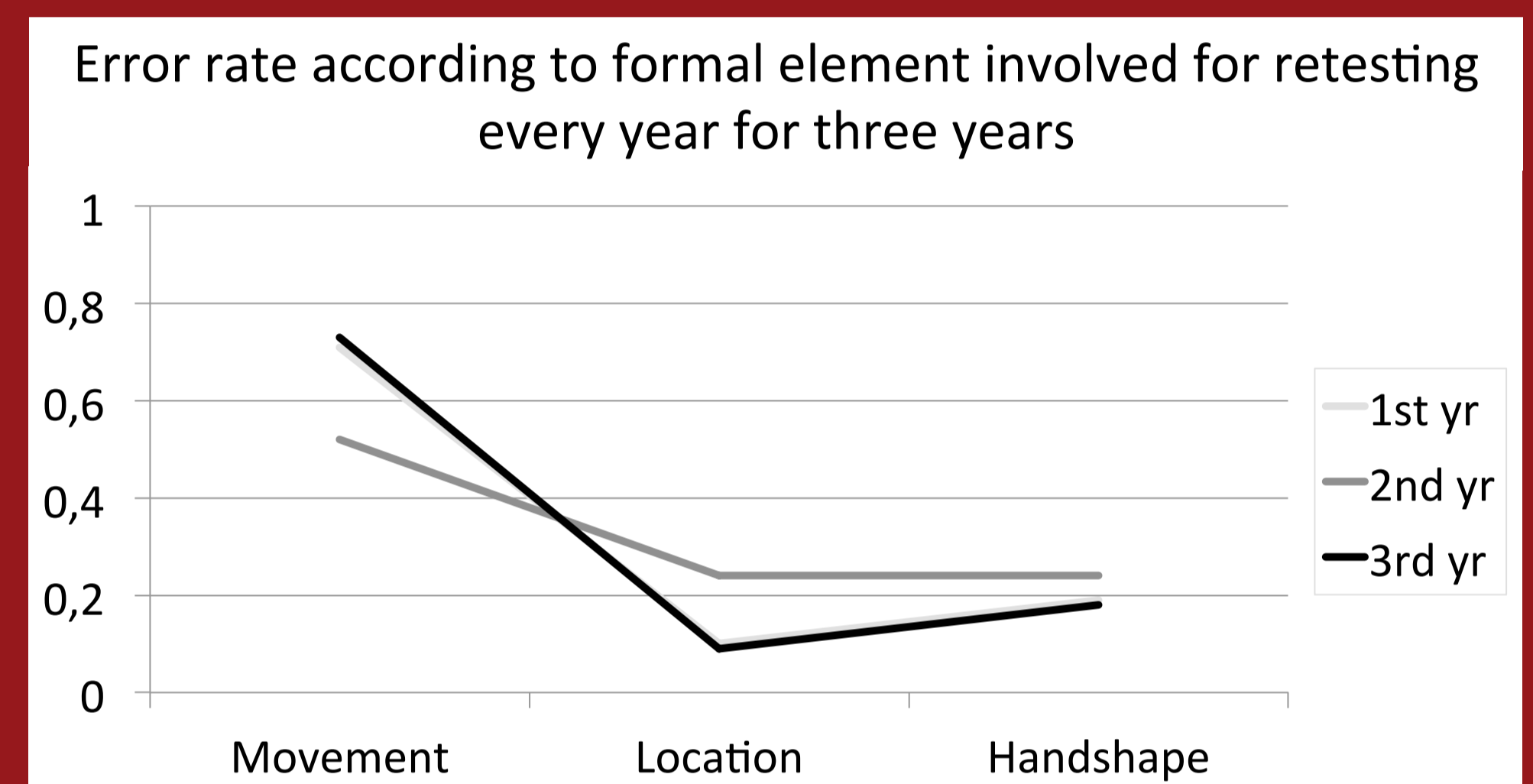
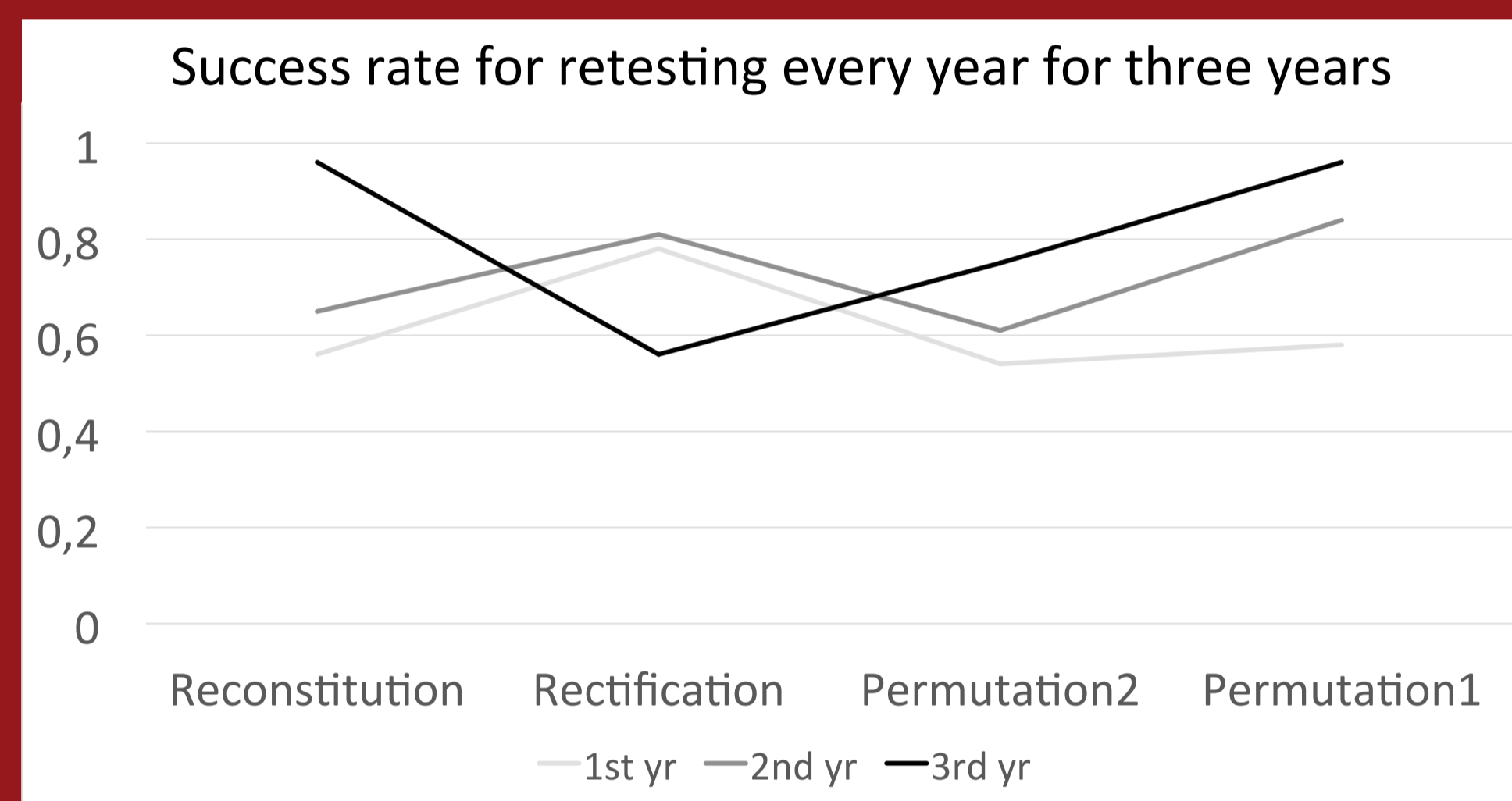
Objective

We present an analysis of deaf childrens' ability to manipulate, in production tasks, formal components that constitute sign units, particularly the movement component.

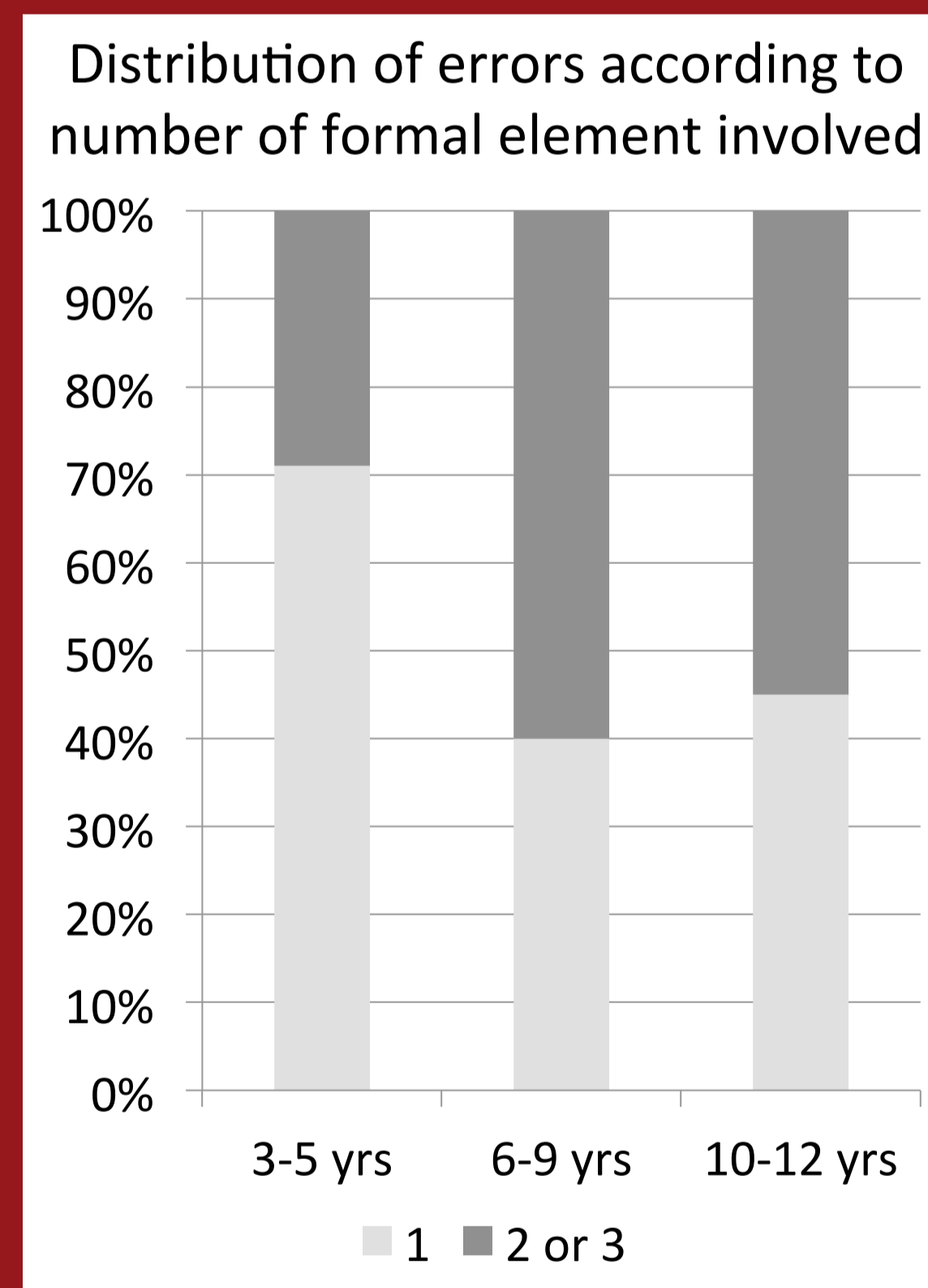
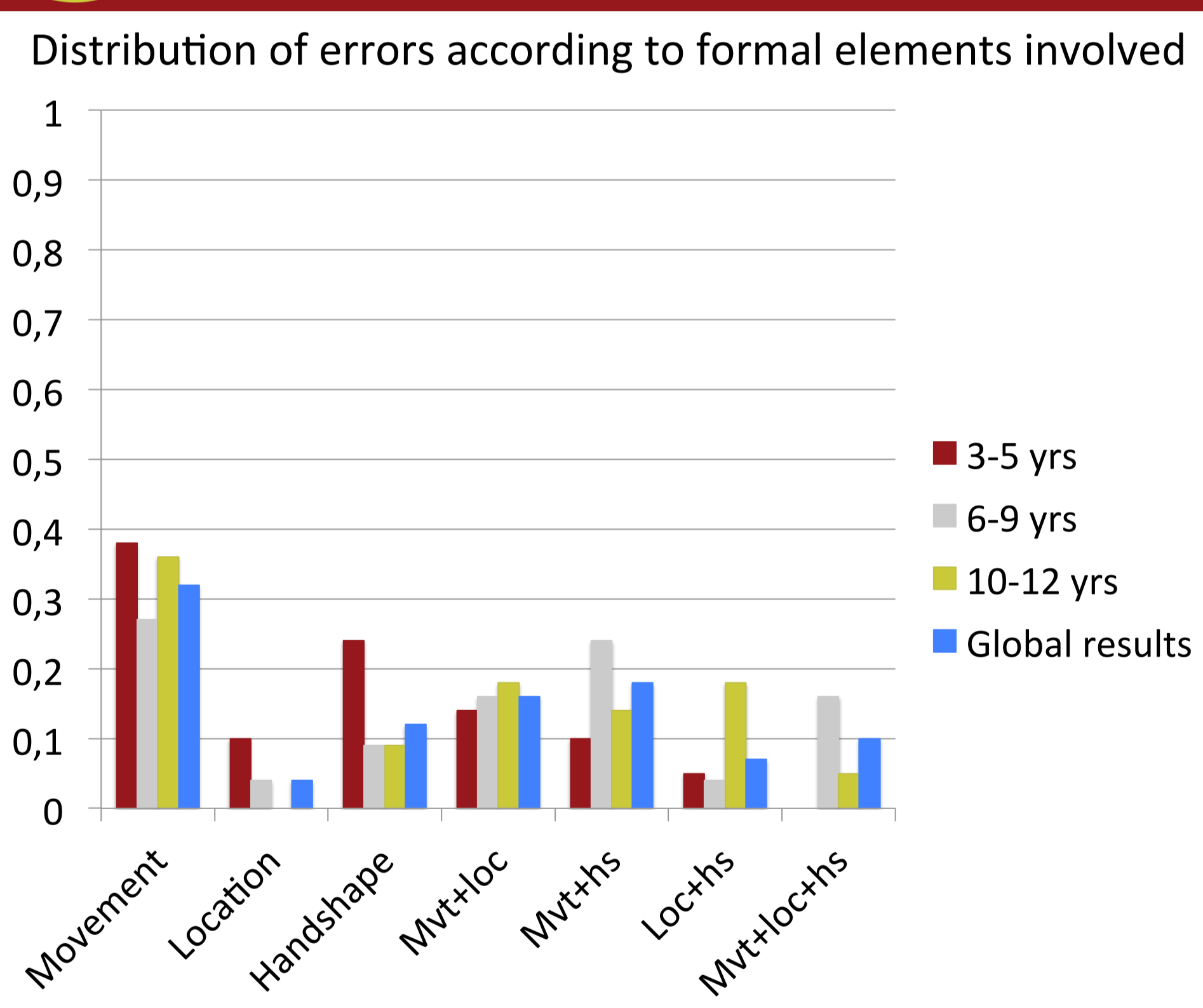
Q1 Success rate by age and task



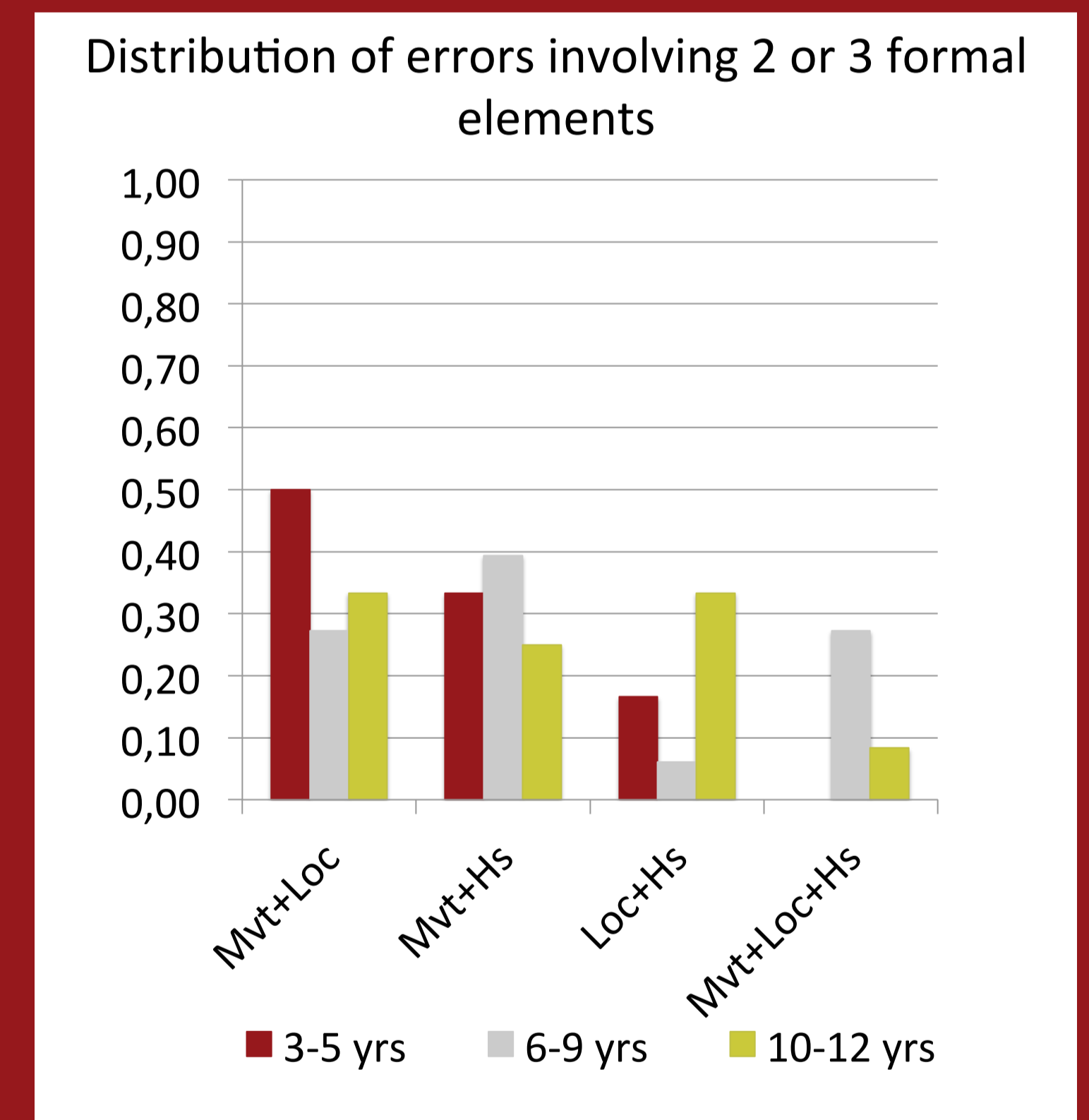
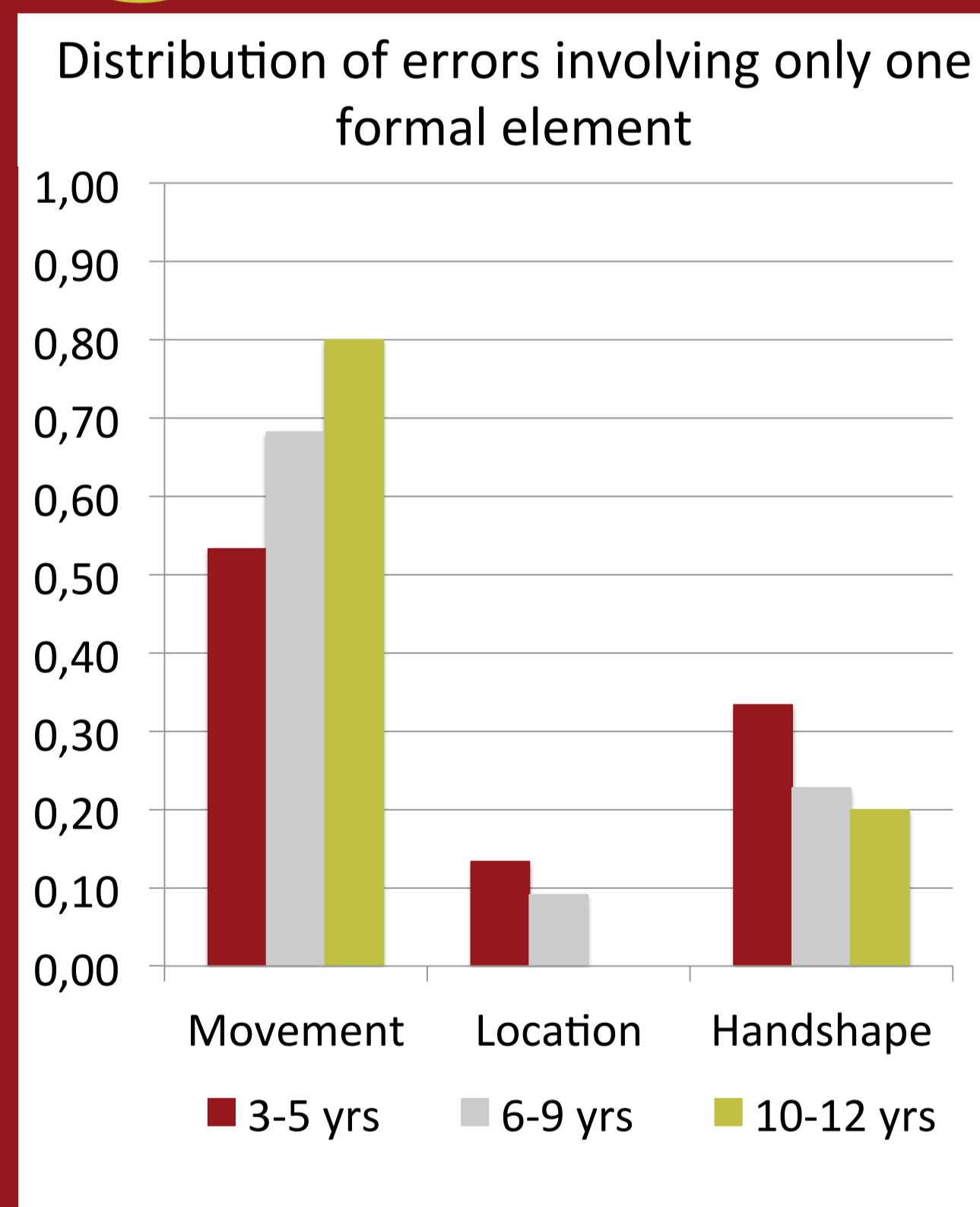
Q2 Retested participants with regard to type of task and formal component



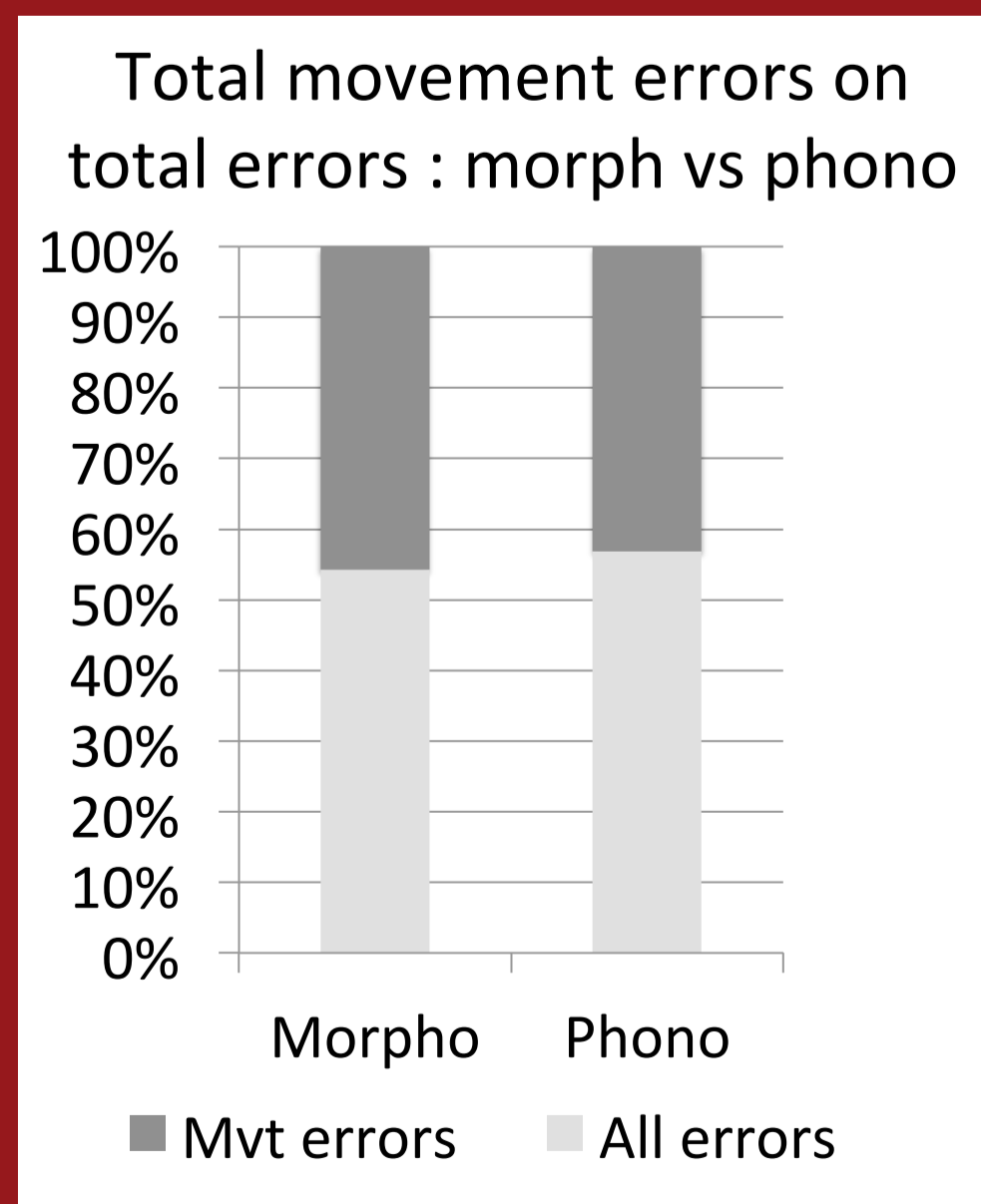
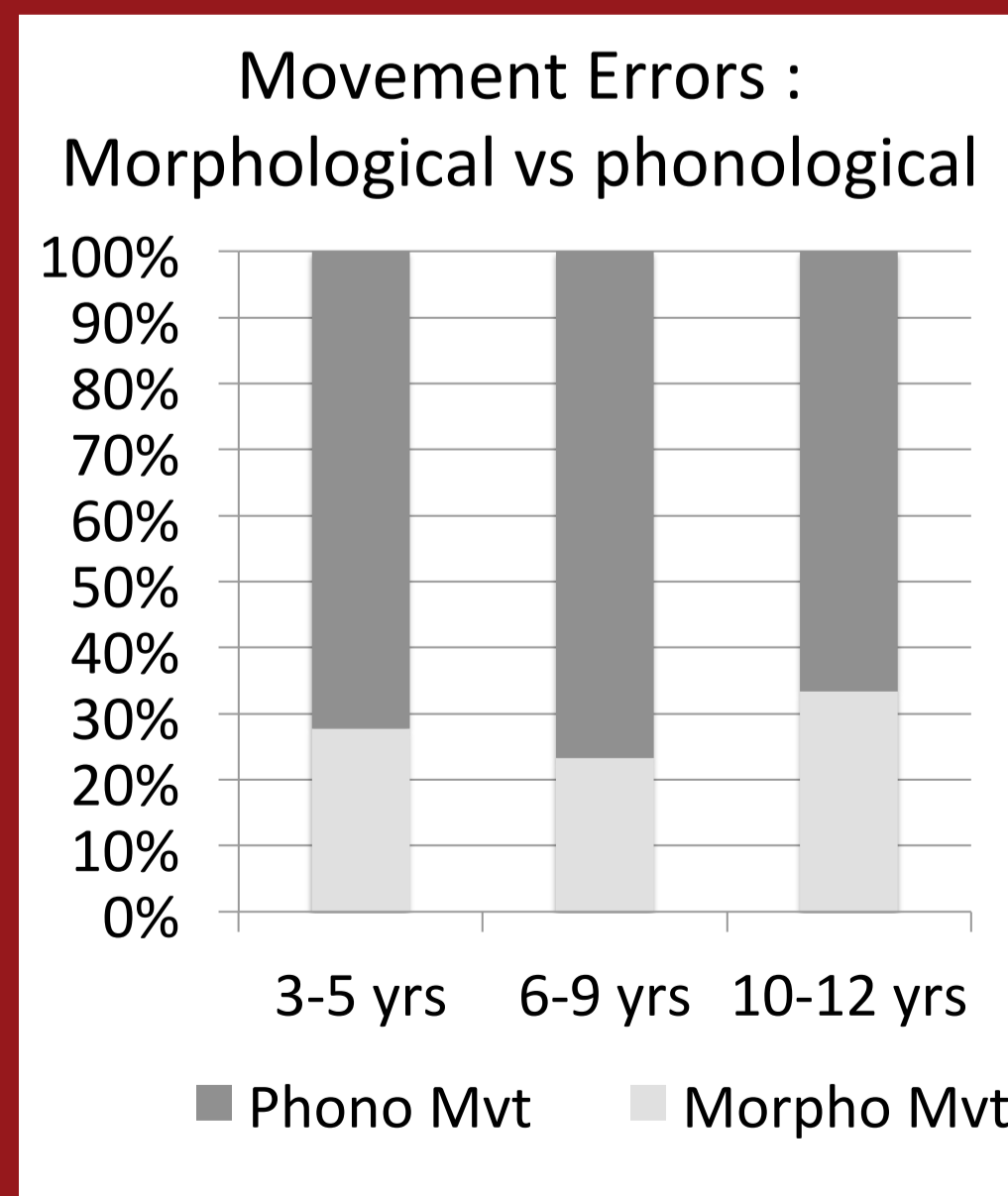
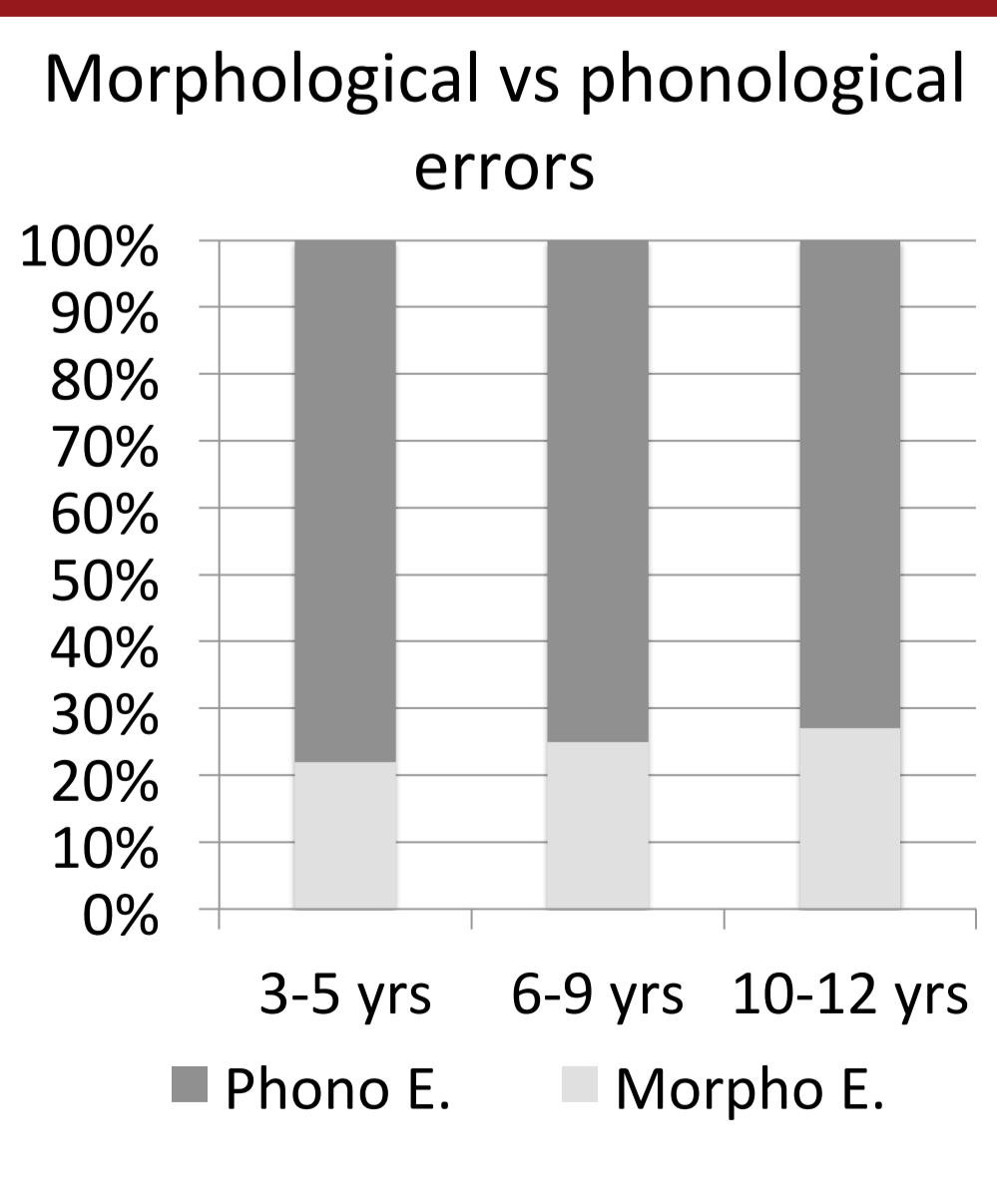
Q3 Errors by formal component



Q4 Involvement of movement in errors



Q5 Distribution of phonological vs morphological movement involved in errors



Conclusions

- Different age groups have distinct scores only for the advanced permutation task, where children aged 3-5 have significantly lower scores than those aged 10-12 ($p=0,039$) (Kuskal-Wallis and Mann-Whitney)
 - Rectification > Reconstitution > Permutation 2
- Over the three years of retesting :
 - Subjects improved their scores significantly on the reconstitution task ($p=0,004$), permutation 2 ($p=0,03$) and permutation 1 ($p=0,002$) (ANOVA de Friedman, and Wilcoxon)
 - Movement errors > location errors ($p=0,001$) but = handshape ($p=0,156$), and = location ($p=0,252$)
 - Global frequency of error-involvement by age-group : Movement > configuration ($p=0,03$) = location ($p=0,06$) (Chi-squared test)
 - Global frequency of morphological error involvement : Movement = location ($p=0,140$) > handshape (Chi-squared test)
 - Global frequency of phonological error involvement : Movement > handshape ($p<0,0001$) = location ($p=0,945$) (Chi-squared test)

Movement appears more complex to master when compared to the other formal elements. This is especially true for phonological errors, in which movement errors are significantly more frequent than both location and handshape errors, whether alone or in combination with another element.