Processing complex structures: Evidence from L1-Greek & implications for bilingual children

Psycholinguistic research has shown that monolingual and bilingual speakers process complex syntactic sentences differently (Marinis et al., 2005). This difference has triggered controversy about the nature of developmental processing pathways in the two populations. Recent offline studies on the acquisition of syntactic dependencies revealed persistent difficulties with the comprehension of *wh*-questions in monolingual children. In fact, felicitous resolution of ambiguous *wh*-questions has been proposed to be modulated by the number and position of case-marking cues in monolingual children (German: Roesch & Chondrogianni, 2015; Greek: Varlokosta et al., 2015). To date, only one offline study has investigated how bilingual children comprehend *wh*-questions when mediated by the number and position of case cue (Roesch & Chondrogianni, 2016). Likewise, the limited real-time studies examining *wh*-questions processing have shown that monolingual children use the presence and position of case cue in Korean (Choi & Trueswell, 2010) and number cue in English (Contemori et al., 2018) to guide ambiguity resolution. Putting the bits and pieces together, offline research provided us with patterns; yet, it does not show the *processes* that underlie incremental parsing.

The purpose of this study is to investigate real-time processing of *wh*-questions in simultaneous and sequential L1-Greek/L2-English bilingual children residing in the UK with L1-Greek as their community language and L1-Greek children residing in Greece comparing Greek as community and L1-language, respectively. The aim is to eye-track the time-course of Greek *which*-questions in the presence of case and gender cues in L1-Greek/L2-English bilingual children.

We present data from L1-Greek monolingual adult (n=20) (m=32) and child (n=36) (m=7.4) control groups. Participants looked at picture animal triplets while listening to stimulus questions and were instructed to click on the target animal. We manipulated number and position of cues (Chondrogianni & Schwartz, 2014). Experimental conditions were: (1) double-cue (case-marked both sentence-initial and sentence-final NPs) (e.g. object: *Pjon.MASC.ACC skiuro.MASC.ACC skepazi o.MASC.NOM lagos.MASC.NOM. to vradi?* "Which squirrel does the rabbit cover in the evening?"), (2) *wh*-cue (case-marked wh-element) (e.g. object: *Pjon.MASC.ACC kikno.MASC.ACC filai to.NEUT.NOM elafi.NEUT.NOM dipla sto potami?* "Which swan does the deer kiss next to the river?"), (3) MNP-cue (case-marked and masculine gender-marked NP2) (e.g. object: *Pjo.NEUT.ACC liontari.NEUT.ACC pleni o.MASC.NOM ipopotamos.MASC.NOM mesa sto potami?* "Which lion does the hippo wash in the river?") and (4) FNP-cue (case-marked and feminine gender-marked NP2) (e.g. object: *Pja.FEM.ACC helona.FEM.ACC skepazi i.FEM.NOM papja.FEM.NOM to proi sto dasos?* "Which turtle does the duck cover in the morning in the forest?") (cf. Figures 1 & 2).

Offline accuracy results showed that the L1-Greek adults had ceiling performance on the comprehension of *wh*-questions, whereas L1-Greek children exhibited a main effect of condition revealing a subject/object asymmetry. There was also found an effect of cue in L1-Greek children indicating better comprehension of double-cue *wh*-questions. Findings suggest a developmental effect between L1-Greek children and adult monolingual controls since the latter but not the former group reached ceiling accuracy. Children controls also performed better when cues were present both early and late in the sentence. Findings are discussed regarding ramifications for bilingual processing and cue integration.
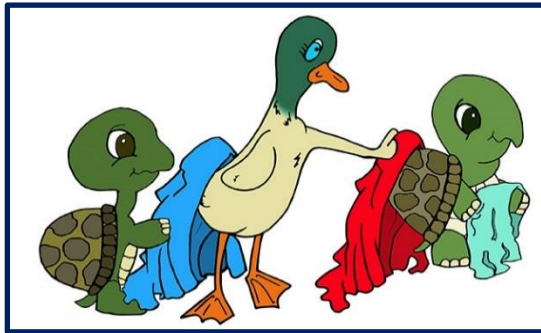
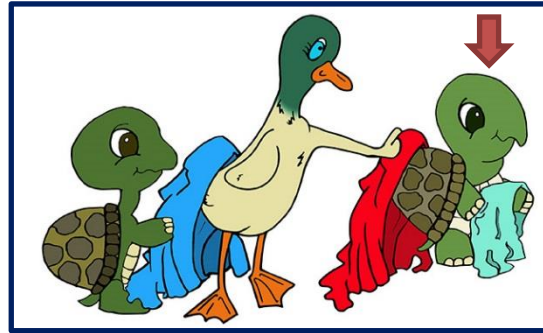Figure 1. Example test trial (animal triplet) in cue condition 4.

Figure 2. Example test trial ((animal triplet) in cue condition 4 (object: "Which turtle does the duck cover in the morning in the forest?") with correct answer.

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