Multilingual Sentence Processing: Armenian-Russian-English

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The study compares the processing behavior of adult multilinguals in their first (L1), second (L2) and third (L3) languages and claims that human language processing in all languages is governed by similar psycholinguistic mechanisms. I argue that similar patterns of processing behavior demonstrated by multilinguals across their languages are not transfer-based. Rather, the speakers acquire parsing strategies typical for their Ln.

The target population of the study is sequential Armenian-Russian bilinguals and Armenian-Russian-English trilinguals. The linguistic target of the experiment is a globally ambiguous relative clause (RC) (1) which has two grammatically possible answers, (1a) and (1b). Meanwhile, native speakers of English prefer answer (1b) (low attachment, LA), whereas, native speakers of Russian tend to select option (1a) (high attachment, HA) to answer a comprehension question in (1) (Fodor, 2002; Sekerina, 2002).

The study adds a new language – Armenian – to its linguistic map. The ambiguous RC in Armenian (2) has a form of a reduced relative. Same as in English and Russian, its structural ambiguity allows RC attachment to either of the head nouns, *knodž (the woman)* or *tornikin (the granddaughter)*. However, the Armenian RC demonstrates a reversed linear order of constituents if compared to English and Russian. The latter enables testing several structure-based processing assumptions.

First, the study checks whether multilingual speakers demonstrate RC resolution typical for a given language: LA in English, HA in Russian. In Armenian, I follow the syntactic analysis of Grillo and Costa (2014) and anticipate preference for answer *tornikin (the granddaughter)* which is structurally equivalent to HA. Meanwhile, the word *tornikin (the granddaughter)* occupies a very different place in a linear sequence of words in the sentence (compare 1 and 2). Second, the study tests whether a perception verb in the matrix clause favors HA in the interpretation of the RC in all three languages (Costa et al., 2015). A perception verb is also anticipated to create a temporary garden path effect and increase the reading time mid-sentence in English and Russian. In Armenian, this effect should not be observed. Third, the study establishes the role of lexical information in sentence processing in L1, L2 or L3: 1/3 of the experimental token prompts HA of RC, 1/3 – LA, and 1/3 has no interpretation bias.

A self-paced reading experiment asked 60 adult multilinguals to work in either: Armenian (L1), Russian (L2), or English (L3). They read a set of sentences seeing one word on the screen at a time and answered comprehension questions selecting between HA and LA. The program Linger recorded their answer choices as well as their reading and response time. Software R used Linear Mixed models for data analysis. The LMM with binomial distribution was used for the analysis of the binary answer choices to the comprehension questions.

The results confirmed the prediction. HA was preferred in Russian and LA in English. Armenian favored the answer structurally equivalent to HA which supported the hypothesis of Grillo and Costa (2014). All three groups of participants shifted their RC interpretation towards HA when the matrix predicate was a perception verb (Grillo et al., 2015). However, Russian and English returned longer reading times mid-sentence after a perception verb. Armenian demonstrated faster reading times after a perception verb. A perception matrix verb created processing difficulty at the response time in Armenian but not in Russian or English. The lexical information caused a slowdown in the reading time mid-sentence in all three languages, but only when the prompted interpretation was incongruent to the option generally preferred in a given language.

To conclude, the human parser is equally sensitive to grammatical prompts of individual languages, be they L1, L2 or L3. RC resolution typical for a given language is preferred in either L1, L2 or L3. The effect of lexical information shows only when it is incongruent to the structural analysis preferred in a given language. The attested processing differences between Armenian, Russian and English occur because the matrix perception verb triggers different structural anticipations in these languages, therefore, the human parser has to recover from misanalysis in different ways in Armenian, Russian and English.

Examples:

(1)
English: The neighbor saw the granddaughter of the woman that was playing with a kitten in the yard.

Russian: Sosedka   videla   vnychku   zhenchiny   kotoray   ugrala
         Neighbor-Nom see-PAST granddaughter-ACC woman-GEN   that-FEM   play-PAST
s   ketonkom   vo   dvore.
s-PRER   kitten-INST   in-PREP   yeard-PREPcase

Who was paying with the kitten?
(a) the granddaughter   (b) the woman

(2) *Armenain*:
Kharevanukhin tecel   e   bakum   pisoi   het hahacoh knodž   tornikin
Neighbor-NOM see-Past aux yard-PREP kitten-DAT prep play-PART woman-GEN granddaughter-ACC

'The neighbor saw the woman's granddaughter playing with a kitten in the yard'

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