

How do L2 learners deal with a “dead” language? A psycholinguistic study on sentence processing in Latin

Many decades of research have shown that sentence processing works in a highly incremental fashion (Marslen-Wilson, 1975) – in the L1 but also (maybe to a lower extent) in the L2. But whereas almost all studies on L2 sentence processing focus on modern languages, it is fully unclear how a language like Latin is processed which fundamentally differs in the way it is taught and used from languages traditionally under consideration. Namely, because Latin is not used for colloquial purposes nowadays, Latin is usually taught in the learners' L1 with a strong focus on formal grammar instruction. Moreover, translation from Latin into the L1 forms an integral part of Latin language learning and learners of Latin are often not used to reading Latin sentences linearly. Thus, we are asking whether L2 learners of Latin show any evidence for incremental processing when 'reading' Latin sentences.

Due to the absence of empirical data and former quantitative studies in the context of Latin, we adopted the idea of actor identification that was first introduced within the Competition Model (MacWhinney et al., 1984) and that has been widely used to examine crosslinguistic differences in sentence processing over the last decades. Following the traditional account, we used 96 easy three-word Latin sentences that were manipulated among the factors animacy, argument order and verb position (see Table 1). Each sentence contained two nouns and one verb which were taken from a set of 24 vocabulary items in total. The 96 stimulus sentences were intermixed with 288 filler sentences to prevent participants from certain strategies. All sentences were presented word by word on a computer screen (for 400ms each).

In a speed-accuracy judgment task, 23 advanced learners of Latin (University students with German as L1) were asked to indicate as fast and accurate as possible whether the sentence was acceptable or not by a pressing a button on the keyboard.

The following two hypotheses have been formulated:

- (A) The more prototypical features the actor of a sentence displays (animate, first argument), the faster and more accurate the sentence is going to be processed.
- (B) Verb-initial sentences are expected to be processed faster since verbal agreement allows for predictions on the number and animacy status of the actor.

We computed repeated measurement ANOVAs for accuracy and reaction times. The results show a clear effect of argument order and animacy in both measures. In addition, we found a significant interaction of verb position and argument order (see Figure 1 and 2), indicating that the argument order subject-before-object led to shorter and more accurate responses for the V2 and V3 sentences but not for sentences with V1. Also, sentences with V3 were processed significantly slower compared to sentences with V1 or V2, regardless of argument order or animacy.

These results show for the first time that Latin learners are indeed able to use language information cues like argument order or animacy to identify the actor of a sentence during online processing because sentence processing was facilitated when the actor displayed prototypical features. Also, verb information was used to predict the number and animacy status of the actor. We interpret these findings as clear evidence for incremental processing in Latin. However, it is still unclear if the applied processing strategies are part of the learners L1 (which was German) or if the learners used Latin-specific strategies. Also, more research is needed to see whether these results can be generalized about other populations (e.g. Latin learners at school) or other language material (e.g. more complex texts).

Argument Order	Animacy	Verb Position	
SO	AS	V3	Oratores vinum amant. The orators _{NOM/ACC PL} the wine _{NOM/ACC SG} love _{PL} . “The orators love the wine.”
OS	AS	V3	Vinum oratores amant. The wine _{NOM/ACC SG} the orators _{NOM/ACC PL} love _{PL} . “The orators love the wine.”
SO	IS	V3	Vinum oratores delectat. The wine _{NOM/ACC SG} the orators _{NOM/ACC PL} pleases _{SG} . “The wine pleases the orators.”
OS	IS	V3	Oratores vinum delectat. The orators _{NOM/ACC PL} the wine _{NOM/ACC SG} pleases _{SG} . “The wine pleases the orators.”

Table 1: Example stimuli. The stimulus sentences were manipulated among the three factors WORD ORDER (SO vs. OS), ANIMACY of the subject (AS vs. IS) and VERB POSITION (V1 vs. V2 vs. V3). Abbreviations: SO = subject before object, OS = object before subject, AS = animate subject, IS = inanimate subject, V3 = verb last, NOM = nominative, ACC = accusative, SG = singular, PL = plural.

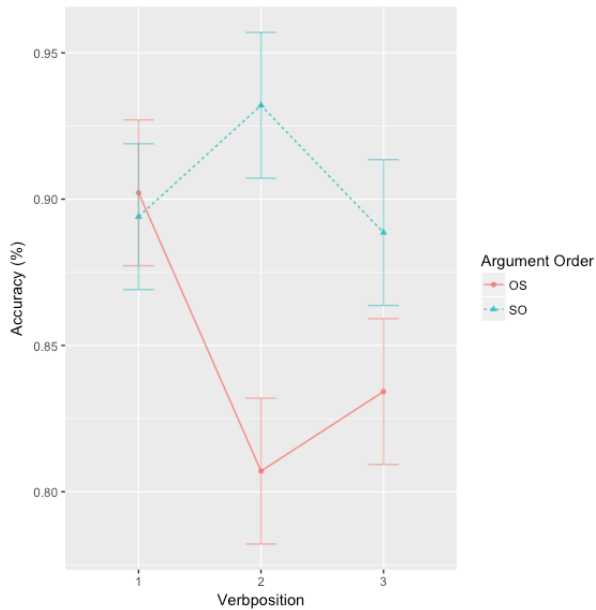


Figure 1: Interaction of ARGUMENT ORDER and VERB POSITION for accuracy results. Abbreviations: OS = object before subject, SO = subject before object, V1 = verb first, V2 = verb second, V3 = verb final position. The bars indicate standard deviation (for F₁).

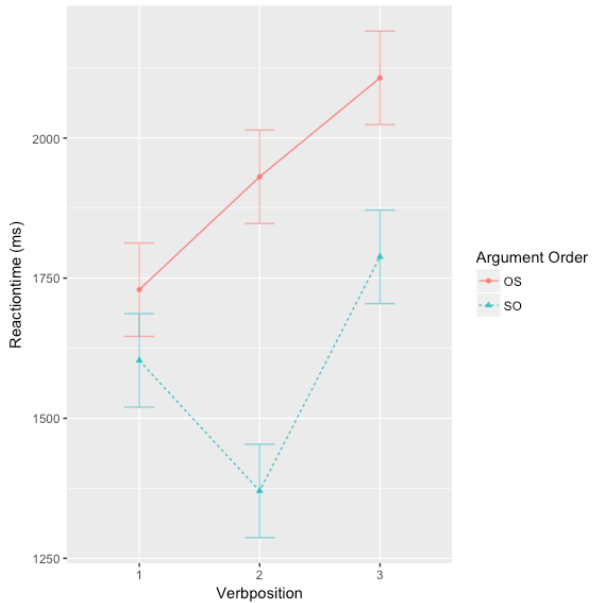


Figure 2: Interaction of ARGUMENT ORDER and VERB POSITION for reaction times in milliseconds. Abbreviations: ms = milliseconds, OS = object before subject, SO = subject before object, V1 = verb first, V2 = verb second, V3 = verb final position. The bars indicate standard deviation (for F₁).

Additional information about Latin and German

Latin

Although there are almost no fluent speakers of Latin anymore, Latin is still learned by thousands of students in schools or at University, especially in the UK and Germany. However, the teaching of Latin is not focusing on communicative skills anymore (most students are not able to have a simple conversation in Latin even after many years of instruction) but on formal grammar instruction and translation into the L1. Thus, learners of Latin are often not used to reading Latin sentences linearly and there is even a popular tendency to translate Latin sentences by searching for the verb and finding its dependent constituents.

This procedure often works well because Latin has a rich case marking system (with 6 cases but without determiners) which allows for a flexible word order. Although in prose texts the verb is often in the final position, the word order can be fully scrambled, especially in poetry texts. Note that there is often ambiguity in the case marking system for certain word classes, e.g. nominative = accusative for all neuter nouns. The verb agrees with the subject with regard to number.

German

Although in German the subject often constitutes the first argument, there is the opportunity for almost all arguments to take the initial position. As in Latin this is enabled by a rich case marking system (4 cases). Usually the case is marked on the determiner (Der_{NOM} Junge sah den_{ACC} Vogel. "The boy saw the bird").

In addition, German has a different word order for main sentences and subclauses: Whereas in main sentences the finite part of the verb typically takes the second position, in subclauses it takes the final position. As in Latin, the finite part of the verb agrees with the subject with regard to number.