Semantics or Morphosyntax? Verb Aspect Processing Depends on Obligatoriness of Morphological Encoding

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Verb aspect is a lexico-grammatical feature that defines the temporal distribution of an event. Specifically, perfective aspect (*washed*) emphasizes event completion within a temporal boundary, while imperfective (*was washing*) presents an unfolding event. Linguistically, English past simple (perfective), although often associated with completion, is not morphologically marked for aspect and can be used with both completed and in-progress events. Past progressive (imperfective) is restricted to unfolding events, although empirical research has shown that it can activate multiple stages of events (1). Past research has investigated whether aspect processing is semantic or morphosyntactic, with more support for the latter.

In this crosslinguistic study we ask whether event status (completed, in-progress) is semantic or morphosyntactic in languages with different degrees of aspect marking. In English, perfective is conveyed by aspectually unmarked past simple, while imperfective, by aspectually marked past progressive. In Russian, aspectual marking is obligatory, with formed by adding a perfectivizing prefix to imperfective (испекла 'finished-baking'). We hypothesize that when aspectual marking is less obligatory, aspect processing relies on semantic mechanisms, whereas when aspectual marking is obligatory, it is morphosyntactic.

Native English (N=14) and Russian (N=14) speakers participated in EEG sessions. The design was 2 Event (In-progress, Completed) x 2 Aspect (Perfective, Imperfective). The stimuli were 256 pictures and captions, presented in 4 blocks. In the two experimental blocks, events in pictures and verb stems in captions matched semantically. In the perfective block, all verbs were perfective. Half were preceded by completed events (congruent), and the other half, in-progress events (incongruent). Likewise in the imperfective block, all verbs were imperfective, preceded by completed events (incongruent) and in-progress events (congruent). In the two control blocks, events and verb stems did not match semantically, leading to an outright semantic violation, serving as a manipulation check. The order of blocks was counterbalanced with participant number. In each trial, a picture was presented for 500 ms, followed by a description, presented word-by-word. Comprehension questions appeared after each trial.

In control blocks, semantic violation at verbs in both perfective and imperfective blocks elicited N400 effects in both English and Russian groups (Fig. 1). Both groups successfully identified semantic mismatches between events in pictures and verbs in descriptions. Perfective violations in the English group (Fig. 2a) elicited N400-like negativity starting at 280 ms and sustained throughout, with a right anterior distribution, without any late positivity, suggesting semantic processing not followed by morphosyntactic repair. Perfective violations in the Russian group (Fig. 2b) elicited a late positivity effect from 600-900 ms, indicating morphosyntactic processing. Imperfective violations in the English group (Fig. 2c) elicited a right anterior negativity from 280-720 ms (at auxiliary verb "was"), also without a subsequent late positivity, again suggesting semantic mechanisms. This enhanced negativity was not maintained during the processing of the lexical verb, suggesting aspectual processing specifically at the auxiliary verb. In the Russian group (Fig. 2d), Imperfective violations did not elicit any significant effects.

In conclusion, these findings advance our understanding of the semantic and morphosyntactic nature of aspect processing and highlight the role of crosslinguistic differences with respect to obligatoriness of aspectual marking. Less obligatory aspect marking leads to semantic processing, while obligatory aspect marking results in morphosyntactic processing. Current effort is focused on testing more participants.

References:

[1] Madden & Zwaan, *Memory & cognition*, 2003.

Table 1. Design and Examples of Stimuli. Asterisk (*) indicated violation.

Picture	Condition	Sentence
 (in progress)	Exp (aspect) Ctrl (semantic)	She ***cleaned / was cleaning** the glasses. She **was *licking / cleaning** the glasses.
 (completed)	Exp (aspect) Ctrl (semantic)	She ***was shredding / shredded** the cabbage. She ***ate / shredded** the cabbage.

Figure 1. Semantic Violation. ERPs for the semantic violation conditions (red) and the semantic match conditions (black). The topographies are based on the difference waves between the two.

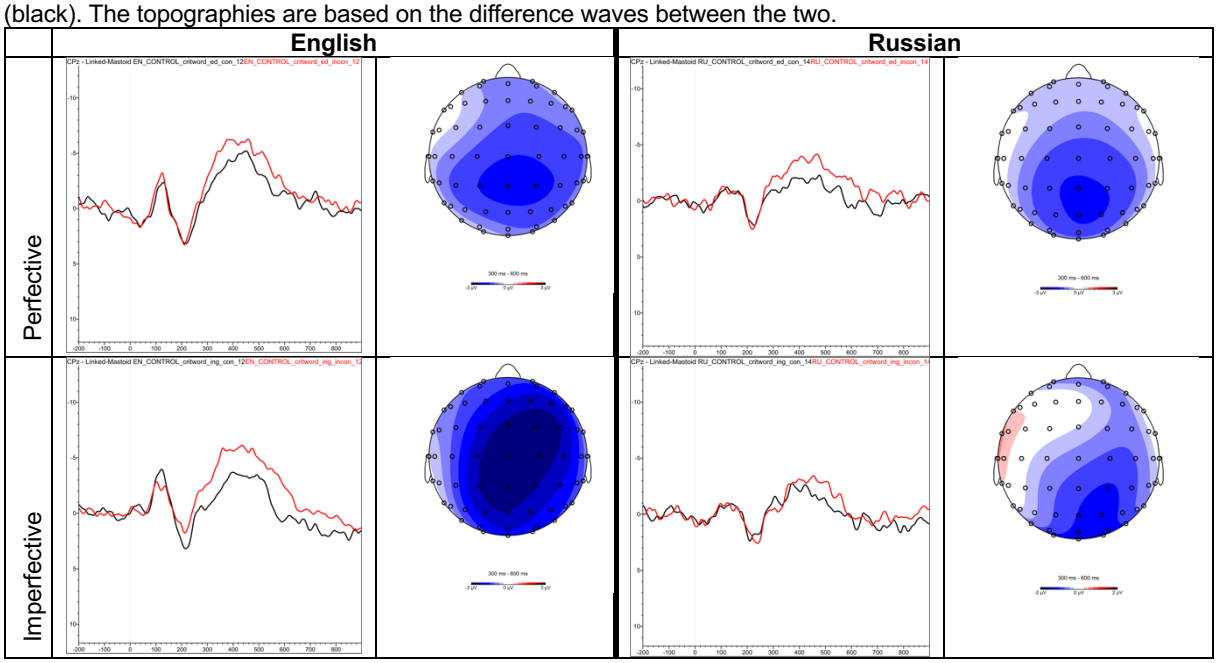

Figure 2. Aspect Violations. ERPs for the semantic violation conditions (red) and the semantic match conditions (black). The topographies are based on the difference waves between the two.

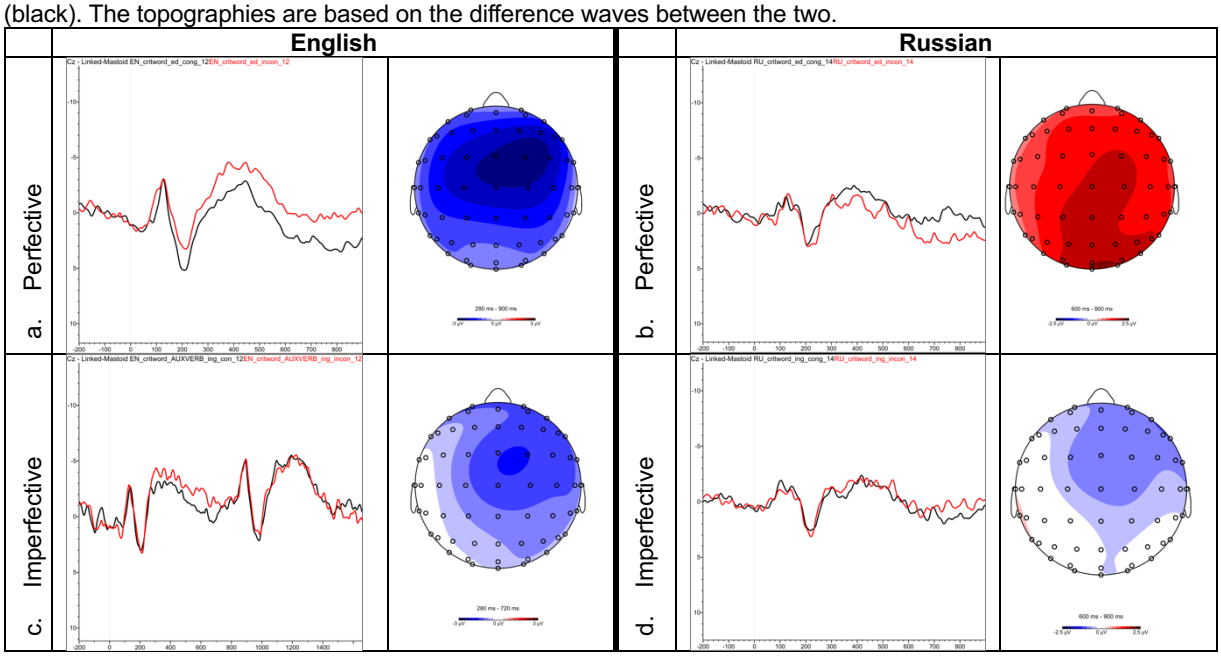

Fig. 2c reflects ERPs for two words (*was* + lexical verb)