

## **Russian/English Orthographic Interference: A Training Study**

Learning a second language is a difficult process. Learning a second language with a novel alphabet can be even more challenging. The cognitive processes involved in learning a new alphabet, and how these processes differ between familiar, novel, and conflicting letter-sound associations is not well understood. For example, there are letters in the Russian alphabet that look the same as letters in the English alphabet, but they have different sounds (e.g., the letter *Р* corresponds to a trilled /r/ sound in Russian). These are called ambiguous interlingual homographs.

The literature has shown that learning a novel writing system is influenced in some way by one's existing alphabet knowledge. What remains unclear is what happens when this existing native language circuitry must be altered by accommodating ambiguous interlingual homographs. The purpose of the current study was to examine the effects of cross-linguistic interference when learning a new writing system. Two main research questions were addressed. First, does learning new (second language) pronunciations for already-known letters interfere with processing these letters in a person's first language? Second, is this interference modulated by the degree of similarity between novel (Russian) and native (English) letters?

To investigate these questions, we used a pre-test/training/post-test design. Native speakers of English with no knowledge of Russian made two separate visits to the lab. On the first visit they completed a pre-test 'mismatch task,' in which they saw words written on the screen and heard either a matching or mismatched word. EEG was recorded during this task. Following this EEG task, participants were trained on Russian letters independently and at their own pace on a computer using a 'forced choice learning' paradigm. On the second visit they repeated the mismatch EEG task to allow for comparison across pre-test and post-test performance.

The EEG data were collected using a 16-channel ActiCAP system and were analyzed by focusing on three main event related potentials (ERPs): The phonological mismatch negativity (PMN), the N170, and the error-related negativity (ERN). The EEG data, as well as behavioural measures (response times and accuracy) were the primary outcome measures for this study. Results will be presented in the context of second language learning, with emphasis on how individuals learn to read a new alphabet.