The Masked Onset Priming Effect (MOPE) has previously been reported in speakers’ first languages (L1). In the present study, bilingual Dutch (L1) – English (L2) participants read aloud L1 target words primed with L2 words. The onset of the primes was manipulated to separate the contribution of orthographic and phonological activation in reading aloud. Orthographically related primes did not lead to faster response times, but event-related brain potentials (ERPs) revealed orthographic priming. Phonologically related L2 primes decreased the response times. ERPs partly supported these phonological priming effects. The results demonstrate that English phonology is also activated in Dutch participants, even when they are in their native monolingual environment and are less familiar with the orthography of the L2.