Previous research has related aptitude in L2/FL learning to individual differences in cognitive ability such as working memory (Daneman 1991; Kormos & Sáfár 2008) and phonological short-term memory (PSTM) (Baddeley & Hitch, 1974). PSTM is the storage responsible for withholding verbal information over short periods of time, and ultimately responsible for the encoding of this information into long-term memory. Numerous studies have related PSTM capacity to successful children’s L1 and L2 acquisition in areas such as vocabulary, syntax, semantics and oral fluency (Adams et al. 1999; Adams & Gathercole 1996, 2000; Blake et al. 1994; Dufva & Voeten 1999; French 2006; Gathercole et al. 1997). PSTM has also been related to adult L2 learners’ oral development (French & O’Brien 2008) and L2 speech learning (Mackay et al. 2001; Cerviño & Mora, in press). Measures of PSTM such as nonword repetition and serial nonword recognition (SNWR) require subjects to recall nonwords, a task that is highly language-specific (Thorn and Gathercole 1999).

Given that traditionally PSTM tasks include nonwords in the subjects’ L1, bilingualism might pose a challenge to measures of PSTM for bilingual subjects. The present study investigated the effect of language dominance on PSTM measures obtained through Catalan (L1/L2) and Russian (Unknown “L0”) SNWR tasks and how these related to a phonological competence measure in English (L3). 45 advanced Catalan-Spanish bilingual learners of English completed SNWR tasks in Catalan and Russian consisting of pairs of sequences of nonwords at increasing 5-, 6- and 7-item lengths. They also participated in a forced-choice word identification task based on minimal pairs with natural and length-manipulated English /iː/ and /ɪ/ that was used as a phonological competence measure testing participants’ accuracy in the weighting of spectral and durational information. The participants were grouped into Low and High use of Catalan groups through median split.

Preliminary correlation analyses showed that PSTM scores were moderately correlated with % use of Catalan (r=.324, p=.028). ANOVAs with Use of Catalan groups (Low vs. High) as the between-subjects factor and Item Length (5, 6, 7) as the within-subjects factor revealed significant main effects for Use of Catalan (F(1, 44)=5.03; p<.001); and Item Length (F(2, 88)=15.27; p<.001); Catalan-dominant bilinguals outperforming Spanish-dominant bilinguals on the Catalan SNWR task (Fig.1). This advantage disappeared at 5- and 6-item length sequences in the Russian SNWR task, thus neutralizing the language dominance effect, but was maintained for 7-item length sequences (Fig.2), suggesting that the larger vowel system of Catalan as opposed to Spanish might have sensitised Catalan-dominant bilinguals to more accurate verbal recall in Russian. Both Catalan and Russian SNWR PSTM measures, however, were found to account for a significant amount of variance in the participants’ perception of natural and manipulated /iː/ and /ɪ/ (11-20.6%); participants with larger PSTM capacity identifying these vowels correctly at significantly higher rates.

These results showed that language dominance significantly affected SNWR task performance in bilinguals and suggest that this effect may partly be avoided by using an L0 SNWR task. Further research is needed to assess vowel system size effects on PSTM measures and develop fully reliable SNWR tasks for use with bilingual populations.
References


