

Neural mechanisms of second language speech production and cognitive control as revealed by event-related potentials

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Bilingualism is hypothesized to confer bilinguals with advantages in cognitive control. The source of these advantages remains speculative, but one tentative explanation proposes that inhibition during speech planning trains cognitive control. In this talk, I will describe a set of studies that ask about the developmental trajectory of mechanisms for L2 speech planning and cognitive control in adult second (L2) language learners. Learners in both studies were native speakers of English who acquired Spanish (L2) in college. In Study 1, I investigate whether speaking the L2 requires inhibition of the L1. When learners performed a blocked picture-naming task, inhibition of the native language was seen following picture naming in the L2. Monolingual controls performing the same blocked naming task in the L1 only showed no evidence of L1 inhibition. In Study 2, I examine the relationship between L2 learners' use of L1 inhibition and bilingual cognitive advantages. If speaking the L2 draws from domain-general inhibitory resources, then bilinguals may accrue expertise in domain-general cognitive inhibition over the course of a lifetime. The present study attempted to capture changes in domain-general inhibition in real time by embedding a domain-general inhibitory task within a speech production task. L2 learners completed a Go/No-go task after naming pictures in the L1 after the L2. Monolinguals performed the same Go/No-go task after naming pictures in the L1 only. ERPs were monitored during the Go/No-go task. ERPs revealed a modulation of the P300 Go-response, but only for L2 learners. I will conclude this talk by considering the implications for models of inhibitory control during L2 learning.

Rhonda McClain received her B.S. from the University of Pittsburgh in Psychology and completed her Ph.D. at Penn State University in Cognitive Psychology. She is currently a postdoctoral fellow in the laboratory of Dr. Matt Goldrick at Northwestern University. Dr. McClain's research interests include bilingualism and individual differences in cognitive control. Her main research focus pertains the means by which bilinguals maintain control of the two languages, particularly during speech production. To what extent does language control rely on domain-general executive control? How does linguistic experience shape the particular outcome of changes to the bilingual's linguistic and cognitive system? In addition, she is interested in the idea that there is considerable variability in individual differences in cognitive control. In another line of research, Dr. McClain aims to examine the implications of natural variability in control for theories of bilingual cognitive advantages. Future goals include assessing multiple aspects of cognitive control that may/may not be unique to bilinguals.