

## Appendix S1

To remove artifacts, the data was despiked using a 17-tap high pass filter (robust for noisy images) from the ArtRepair toolbox in SPM (Mazaika et al., 2005). Upon visual inspection after despiking, 39 bilinguals and 36 monolinguals had usable data for the shape-color task, and 24 bilinguals had usable data for the picture-naming task. For the participants who still had visible artifacts after despiking, independent component analysis (ICA) was applied using the GIFT toolbox (v3.0b) in SPM (Calhoun et al., 2009). In this ICA analysis, each participant's data was analyzed separately in order to create independent components within a single participant's fMRI activity using the FastICA algorithm (Hyvärinen & Oja, 1997). In order to identify the artifact of interest (i.e., a striping/banding pattern), the total number of components was reduced to 20 using principal components analysis (PCA). Those 20 components were visually examined in order to find the component(s) that best represented the striping/banding artifact (see Supplemental Figure 1). These components were removed from the data. This process was effective in removing the banding artifact from an additional nine bilinguals and six monolinguals for the shape-color task and an additional 20 bilinguals for the picture naming task. Thus, after both despiking and ICA were applied to remove the striping/banding artifact, the sample for the shape-color task consisted of 45 bilinguals and 40 monolinguals, and the sample for the picture naming task consisted of 44 bilinguals. The number of bilinguals who had usable data for both tasks was 41.