

# LANGUAGE LEARNING IN SECOND LIFE

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Shin-Yi Fang (during her post-doc)

# PROJECT SUMMARY

We are interested in comparing language learning in virtual environments with more traditional classroom methods. This study specifically compared structural MRI differences between English monolingual adults learning Mandarin Chinese via picture-word association (PW) vs virtual environment (VE) in Second Life. Training took place over 2-3 weeks, comprising 7 training and testing sessions. In both training groups, participants learned the same 90 audio-visual pairs, comprising of items that would belong in either a zoo, supermarket, or dining room. MRI session 1 was taken after 1 cognitive testing session and 1 training/testing session, while MRI session 2 was taken immediately after the 7<sup>th</sup> training session. ROIs were a-priori designated by regions implicated in Abutalebi and Green's (2007) language control network, including the bilateral ACC, caudate & putamen, IFG, & IPL.

## Completed

Data collection

Data analysis  
(without 2<sup>nd</sup> control dataset)

Finished manuscript  
w/o 2<sup>nd</sup> control data; abstract submitted

Reconstructions for  
data w/ 2<sup>nd</sup> control data

## In progress

Data analysis with  
2<sup>nd</sup> control dataset  
[mid Aug]  
• Preprocessing  
• Group analyses

## Not yet started

Add 2<sup>nd</sup> control dataset to  
manuscript &  
submit to journal  
[mid Sept]

Possible: GIMME  
analyses of right  
hemisphere

# PROGRESS MADE: DETAILS

Jen

- helped with the revisions for the grant
- helped collect the behavioral and scanning data
- preprocessed the VE and PW sMRI data using Freesurfer's longitudinal reconstruction/ preprocessing
- used Freesurfer's linear mixed effects modeling to conduct univariate and mass-univariate analyses
- found a possible 2<sup>nd</sup> control data set (the first being each individual's T1) from a data sharing database and will preprocess and conduct group analyses via the above methods
- Finished manuscript w/o 2<sup>nd</sup> control data; abstract submitted to special issue of Brain & Cognition

## FURTHER NOTES

Functional MRI data were also collected but were found to be inconclusive via Shin-Yi's (post-doc at the time) analyses. Shin-Yi did some GIMME analyses to examine functional connectivity but only in the left hemisphere.

Some rs-fMRI and some DTI data were collected, but had to be cut from protocol for most participants due to issues with the scanner.

Jen previously conducted VBM analyses on these data using SPM8 and SPM12 but there were no significant results. eTIV was used as a control variable, and groups had equal age and genders.