

Introduction

Purpose: Examine the effects of handedness on verbal memory tasks.

Background: Language is primarily processed in the left hemisphere. This is true even for most left-handed individuals. However, there is little research that examines the effects of handedness on language tasks and many brain imaging studies prohibit left-handed individuals from participating. One exception to this was a set of experiments demonstrating that non-leftward language network lateralization is correlated with higher scores on the CVLT (Catani, et al. 2007). However, even that study only examined brains of right-handers. Therefore, we are still left without clear information regarding the effects of handedness on verbal memory. To test this, we administered the California Verbal Learning Task (CVLT) to left-handed and right-handed participants. Additionally, we collected information about preferred hand use (Edinburgh Handedness Inventory, EHI) and number of left-handed relatives (Familial Sinistrality, FS).

Hypothesis: Familial-sinistrality will be positively correlated with CVLT scores and EHI will be negatively correlated with CVLT scores, meaning left-handed individuals will have higher CVLT scores.

Method

Participants

59 individuals participated – 18 left-handed and 41 right-handed.

Measures

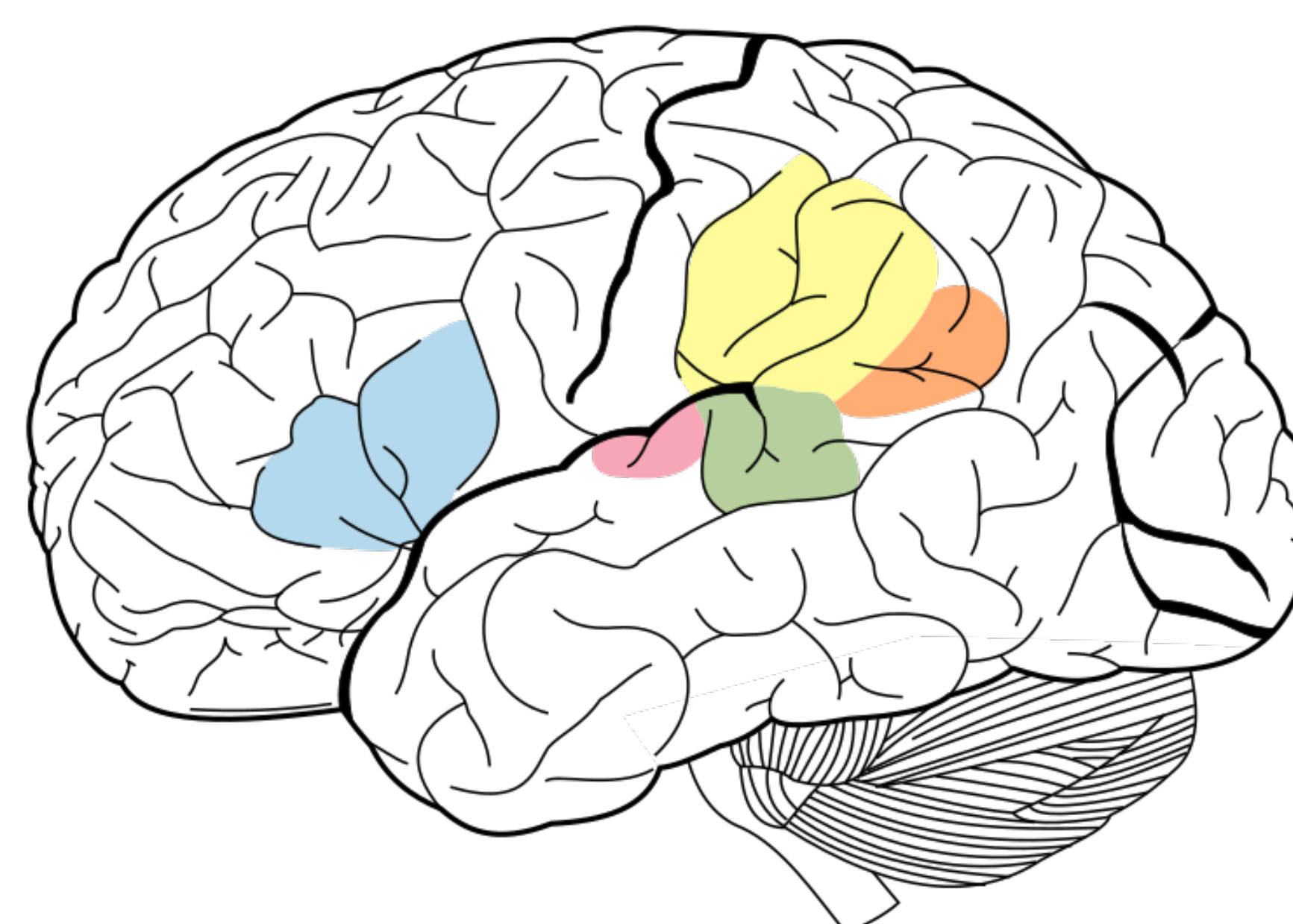
Edinburgh Handedness Inventory (Oldfield, 1971) – This is a self-report scale that provides an indication of the degree of handedness an individual is classified as based on which hand they use for basic daily tasks.

Familial-Sinistrality – This is a self-report scale where participants report the number of first-order (parents, grandparents, siblings) that are left-handed.

California Verbal Learning Task – Participants are read a short list of words and are asked to report back words they are able to recall (4 trials of immediate recall, short-delay recall, long delay recall,, cued recall,, yes/no recognition).

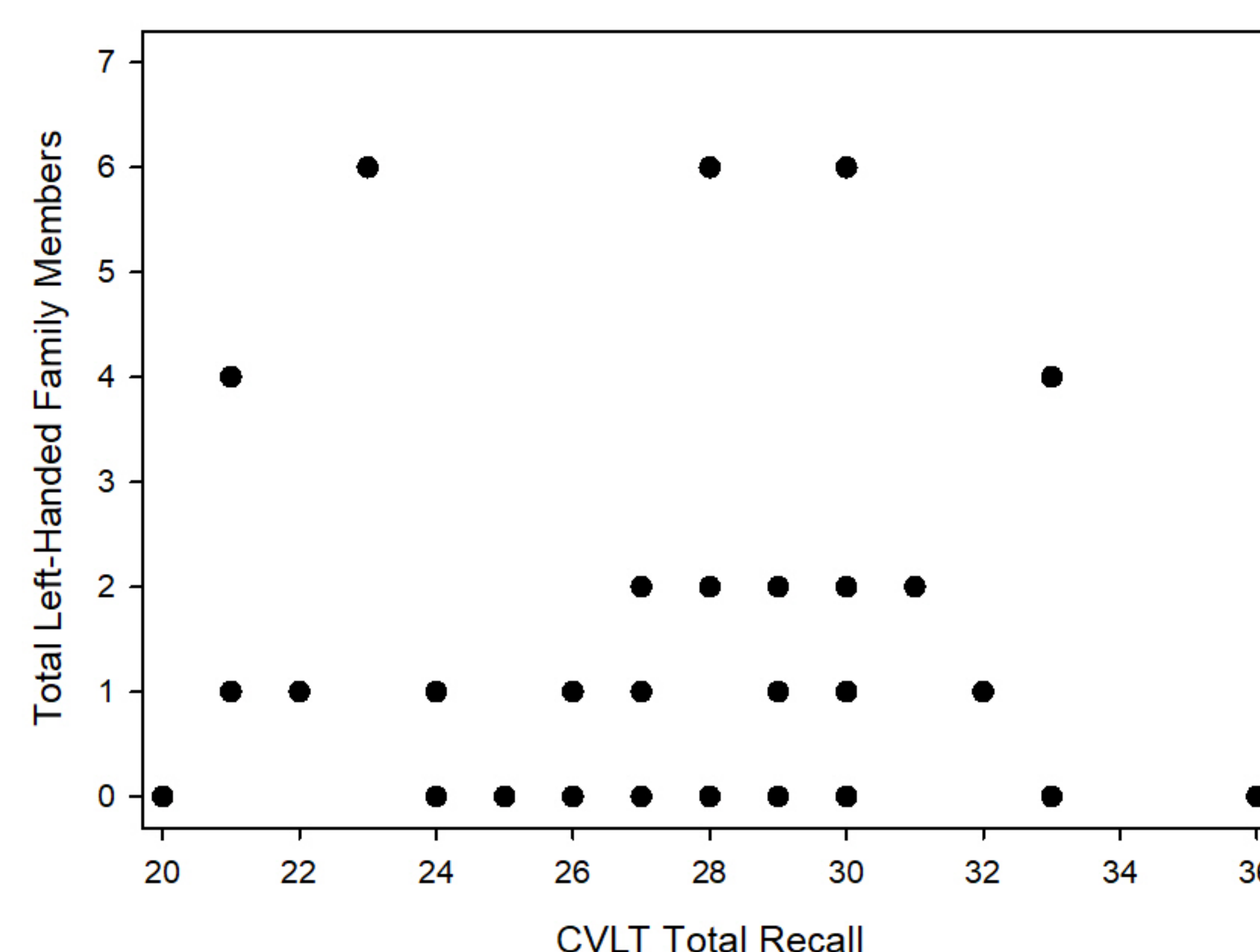
Procedures

Participants completed these tasks as part of a larger battery of instruments. The tasks for this project were completed with pen and paper or verbal responses (CVLT).

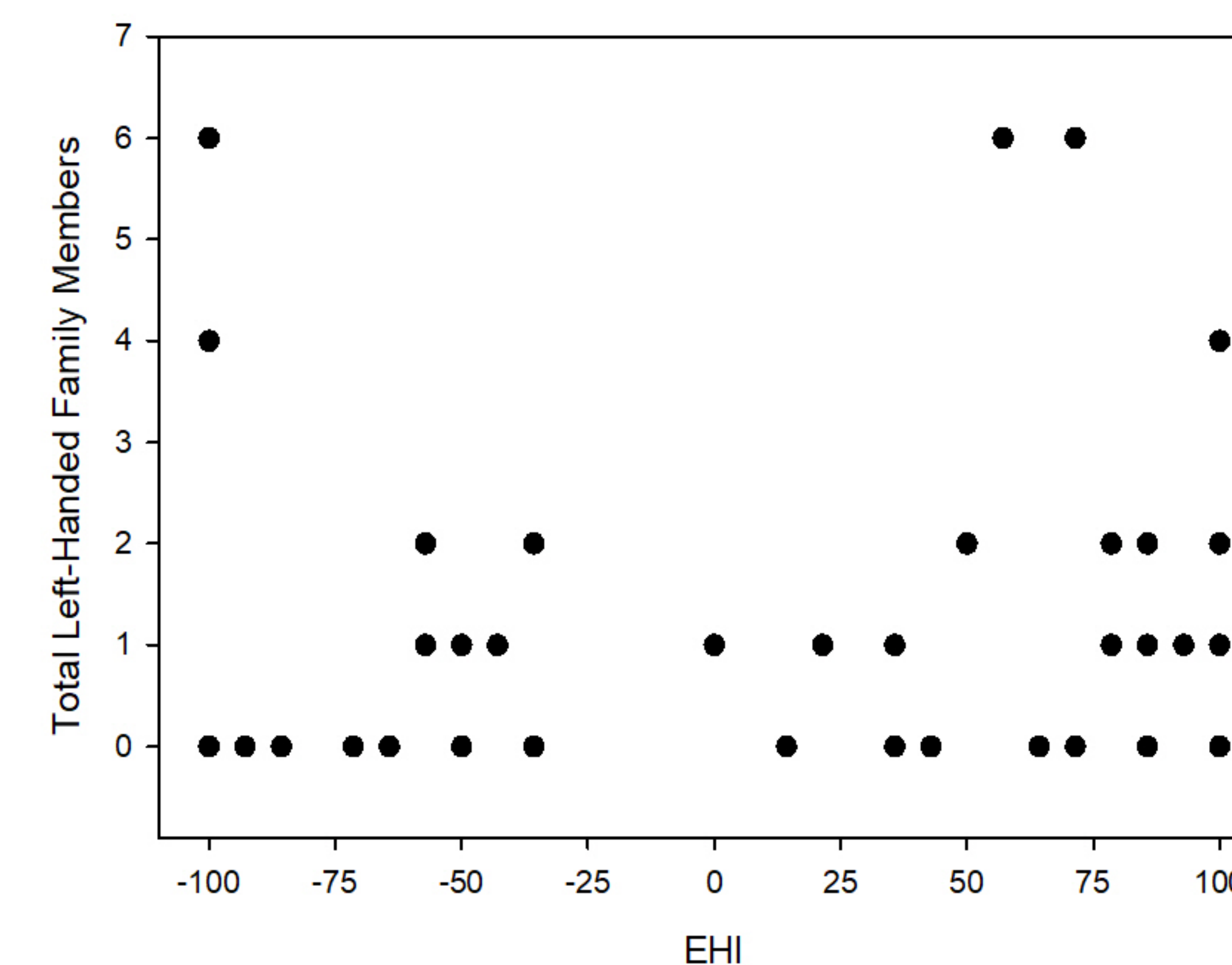


Highlighted regions are those involved in language processing.

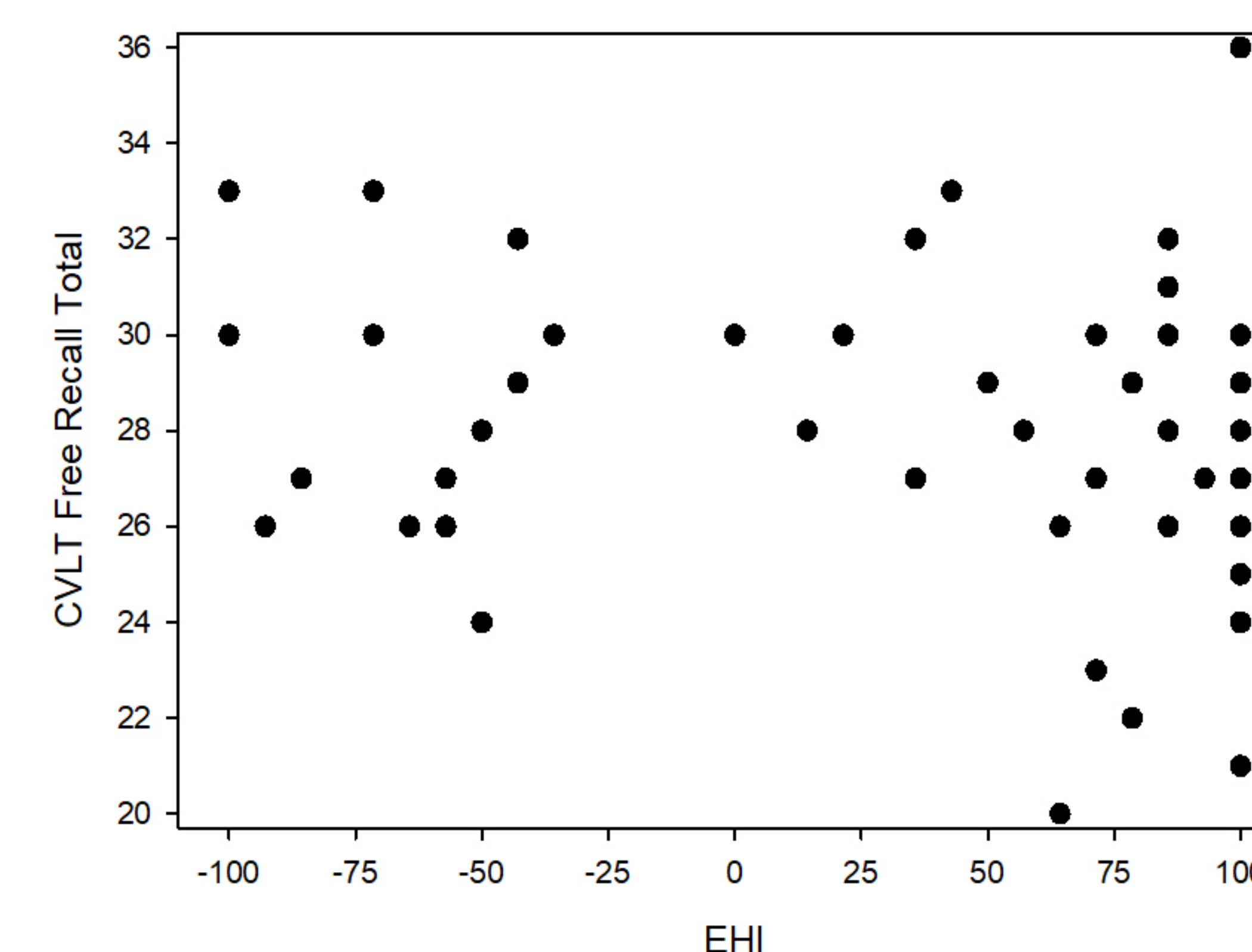
Familial Sinistrality v CVLT Total Recall



EHI v Total Familial Sinistrality



Handedness v CVLT Free Recall



	EHI	FSTot	CVLT
Left	-63.888*	1.056	28.722
	27.877	1.626	2.605
Right	80.139*	0.975	27.634
	25.780	1.476	3.753

Conclusion, Limitations, and Future Directions

- No significant relationship was discovered between familial-sinistrality, EHI, and CVLT.
- However, with a small sample size, we are limited on the magnitude of the correlations that could be concluded.
- Using an equal sample of both left and right-handed participants would allow better insight into the differences in verbal learning in regard to handedness.

With this in mind, we plan to move forward and pull data draw a larger sample.

References

Catani, M., Allin, M. P. G., Masud, H., Pugliese, L., Mesulam, M. M., Murray, R. M., & Jones D. K. (2007). Symmetries in human brain language pathways correlate with verbal recall. *Proceedings of the National Academy of Sciences*, 104 (43), 17163-17168. doi: 10.1073/pnas.0702116104

Oldfield, R. C. (1971). The Assessment and Analysis of Handedness: The Edinburgh Inventory. *Neuropsychologia*, 9, 97-113.