

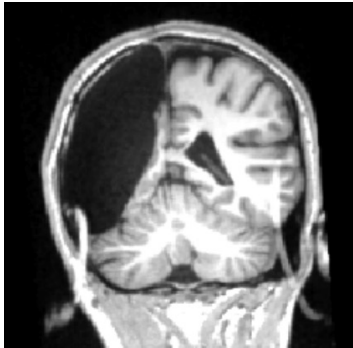
Literacy Skills in School-aged Children After Hemispherectomy

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INTRODUCTION

This study investigated reading and related skills in children obligatorily reliant on a left versus right hemisphere.

Hemispherectomy occurs in 16-20% of all epilepsy resections in the US.



Surgical intervention with hemispherectomy (functional or anatomic) may be recommended and prove highly effective when seizures cannot be medically-controlled and other criteria are met.

There is limited research on the impact of hemispherectomy on psychoeducational outcomes. Literacy development is important to understand for children returning to formal schooling post-hemispherectomy.

Table 1. Clinical & demographic variables by hemispherectomy group

Participants	Left Hemispherectomy <i>n</i> = 10 (6 female, 4 male)	Right Hemispherectomy <i>N</i> = 14 (7 female, 7 male)
SES (parent education)	18.90 ± 2.02, 15.00–21.00	18.32 ± 1.46, 15.00–21.00
Age at first seizure	<i>n</i> = 8, 3.15 ± 3.16, 0.01–7.60	2.23 ± 3.30, 0.01–11.83
Age at surgery	5.52 ± 3.64, 0.54–11.46	4.98 ± 3.81, 0.71–12.90
Years (seizure to surgery)	<i>n</i> = 8, 4.7 (3.1)	2.74 ± 2.81, 0.31–9.62
Age at evaluation	10.19 ± 3.35, 6.05–14.61	11.68 ± 3.66, 6.72–18.75
Years since surgery	4.38 ± 3.09, 0.47–9.67	6.30 ± 3.13, 1.38–10.54

Acknowledgements: Participants were recruited through *The Brain Recovery Project*, a national organization for families of children who have undergone hemispherectomy surgery. All testing was conducted at their annual meeting. We extend our gratitude to participants and families, and BRP.

METHODS Participants (*n* = 24, 13 female) who underwent left hemispherectomy (LH; *n* = 10) or right hemispherectomy (RH; *n* = 14) completed a battery of standardized psychoeducational assessments. LH and RH groups were balanced for socioeconomic status, sex, and age. Standard scores using age-based norms were used in analyses for all tasks. Parents of participants responded to questionnaires regarding developmental, medical, and educational history.

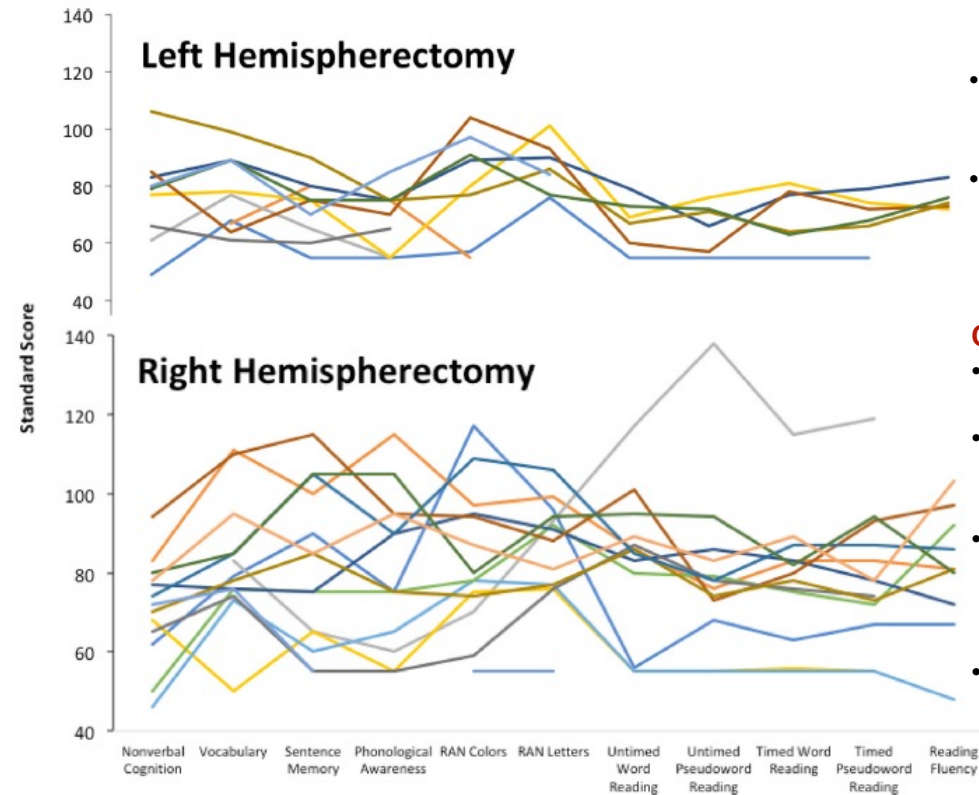


Figure 1. Performance on Measures by Individual and Group

Note. Assessments have a mean standard score of 100 and a standard deviation of 15.

RESULTS

- Composite performance on language and reading measures for all patients post-hemispherectomy fell below the population mean (RH: -0.79 to -1.95 SDs; LH: -0.97 to -2.32 SDs).
- Patients post-RIGHT hemispherectomy learned to read sooner ($p = .011$) and performed significantly better than left hemispherectomy patients for untimed single word reading ($p < .05$) with moderate effect size.
- Higher scores across reading-related measures were associated with a younger age of reading acquisition post-hemispherectomy.
- A shorter duration of time between first seizure and surgical intervention was correlated with higher word reading scores and receptive vocabulary ($p < .05$) rather than earlier surgery alone.

CONCLUSIONS

- A preserved RIGHT hemisphere can support reading skills acquisition.
- A preserved LEFT hemisphere supports stronger performance for reading skills as well as receptive vocabulary, sentence memory, and nonverbal cognition.
- Investigations of psychoeducational outcomes in children post-hemispherectomy can offer insights into compensatory potential for left and right hemispheres and inform educational programming.
- More reading experience is associated with stronger literacy skills and is important to promote explicitly and strategically as soon as any child has experienced a seizure.

