Intensive Cognitive-Communication Rehabilitation (ICCR) program for Young Adults With Acquired Brain Injury

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OVERVIEW

- Intensive Cognitive-Communication Rehabilitation (ICCR) is a program for young adults with Acquired Brain Injury (ABI) who are interested in continuing or pursuing higher education.
- This multifaceted, intensive, and functional program was developed in accordance with cognitive rehabilitation guidelines (Cicerone et al., 2011; DVBIC, 2015; Mateer & Mapou, 1996; Twamley et al., 2012) and principles of neuroplasticity (adapted from Kleim & Jones, 2008).

Multifaceted: Lecture-style courses, speech-language-cognitive therapy, meta-cognitive group therapy, app-based therapy, computer work

Functional: Academic and cognitive-linguistic skills applied in the milieu

Intensive: 6 hours/day, 4 days/week, 15-week semester

OBJECTIVES

1. Assess the effectiveness of a multifaceted, integrated intervention on the rehabilitation of language and cognitive skills for young individuals with ABI
2. Track the rehabilitation of specific cognitive-linguistic domains (e.g., attention, verbal expression)
3. Evaluate gains in academic performance and on speech, language, and cognitive therapy goals

ASSESSMENTS

Cognitive-Linguistic measures

- Western Aphasia Battery – Revised (WAB-R), Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), Scales of Cognitive and Communicative Ability (SCCAN), Goal Attainment Scale (GAS), Test of Written Language (TOWL), Discourse Comprehension Test (DCT), Communication Assessment Profile (CASP), Assessment for Living with Aphasia (ALA), Pragmatic Protocol

Classroom measures

- Participation, weekly quizzes, final exams

Speech-Language-Cognitive Therapy measures

- Progress on short- and long-term impairment-based goals

PARTICIPANTS

		Experimental Participants P1	P2	P3	Control P4
Etiology		TBI	CVA	TBI	CVA
Age		21	29	25	31
Sex		M	M	M	F
Education (years)		12	15	10	14
Months post-onset		50	36	73	22
WAB-R	AQ	61.9	80.4	68.5	87
	LQ	56.8	72.4	73	83.7
	CQ	65.2	76.8	75.4	88.2
RBANS - Index		45	60	46	72

TBI = Traumatic Brain Injury; CVA = Cerebrovascular Accident; WAB-R = Western Aphasia Battery - Revised (Kertesz, 2007), AQ = Aphasia Quotient, LQ = Language Quotient, CQ = Cortical Quotient; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status - Update (Randolph, 2012)

INTERVENTION

	Monday	Tuesday	Wednesday	Thursday
10:00	Psychology 110	Economics 101	Psychology 110	Economics 101
11:00	US History 180	Finance 102	US History 180	Finance 102
12:00	Lunch	Lunch	Lunch	Lunch
1:00	Group Therapy	Group Therapy	Group Therapy	Group Therapy
2:00	App-Based Therapy	App-Based Therapy	App-Based Therapy	App-Based Therapy
3:00	Communications 140		Communications 140	

Courses

- **Core Courses**
  - Economics, Psychology
  - All participants (n = 3) attend every 1-hour class
  - Video lectures, group discussion
  - Weekly quizzes, final exam
- **Elective Courses**
  - US History, Communications, Finance
  - Participants attend 1-2 lectures per week of each class (pull out SLP services 1 section/daily)
  - Project- and performance-based learning

Speech-Language-Cognitive Therapy

- Individual sessions (1-hour daily)
- Goal-directed, cognitive-linguistic intervention
- Impairment-based approach

App-Based Therapy

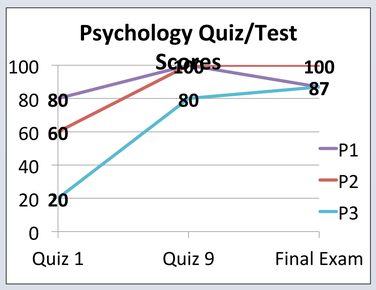
- Microsoft Office, E-Mail, Google/Internet tutorials, speech and language therapy apps

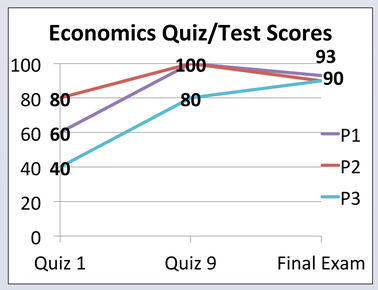
Group Therapy

- Meta-cognitive strategy training (1-hour daily)
- Daily home exercises to promote maintenance and generalization

RESULTS

All participants (n = 3) exhibited substantial gains in classroom performance during the first semester.





SELECTED REFERENCES

Cicerone, K., Langenbahn, D. M., Braden, C., Malec, J. F., Kalmar, K., Fraas, M., ... & Ashman, T. (2011). Evidence-based cognitive rehabilitation: Updated review of the literature from 2003 through 2008. *Archives of Physical Medicine and Rehabilitation, 92*, 519-530. doi:10.1016/j.apmr.2010.11.015.

Constant Therapy (2016). Constant Therapy (v3.1.2) [Mobile application software]. Retrieved from constanttherapy.com.

Defense and Veterans Brain Injury Center (DVBIC). (2015). Study of Cognitive Rehabilitation Effectiveness [Study Manual]. Bowles, A. O., Cooper, D. B., Aiken, M. E., Miller, K. J., & Manion, S. T. (Eds.). Retrieved from http://dvbic.dcoe.mil/study-manuals.

Kennedy, M., Avery, J., Coelho, C., Sohlberg, M.M., Turkstra, L., Ylvisaker, M., & Yorkston, K. (2008). Intervention for executive functions after traumatic brain injury: A systematic review, meta-analysis and clinical recommendations. *Neuropsychological Rehabilitation, 18(3),* 257-299. doi:10.1080/09602010701748644.

Kleim, J. A. & Jones, T. A. (2008). Principles of experience-dependent neural plasticity: Implications for rehabilitation after brain damage. *Journal of Speech, Language, and Hearing Research (51),* S226-S239.

Mateer, C. A. & Mapou, R. L. (1996). Understanding, evaluating, and managing attention disorders following traumatic brain injury. *Journal of Head Trauma and Rehabilitation, 11(2),* 1-16.

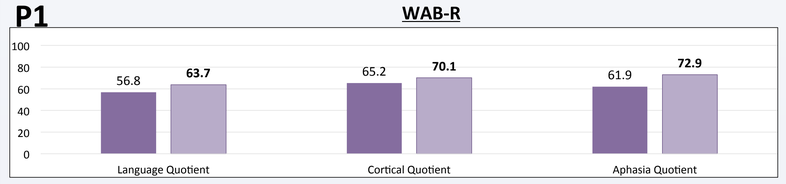
Sohlberg, M. M., Ehlhardt, L., & Kennedy, M. (2005). Instructional techniques in cognitive rehabilitation: A preliminary report. *Seminars In Speech and Language, 16(4),* 268-279.

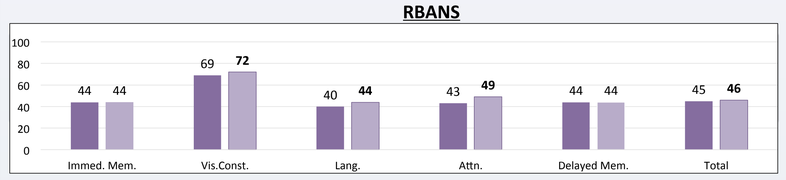
Sohlberg, M. M. & Turkstra, L. A. (2011). *Optimizing cognitive rehabilitation: Effective instructional methods*. New York: Guilford Press.

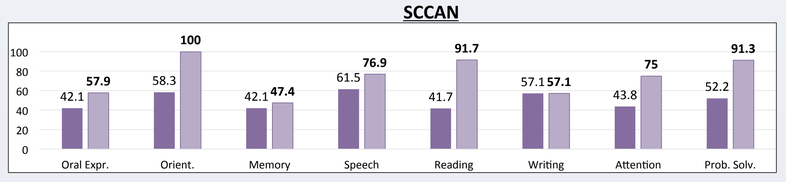
RESULTS

All participants (n = 3) demonstrated substantial gains on cognitive and linguistic measures.

P1







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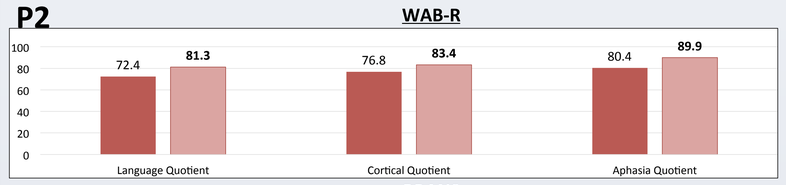

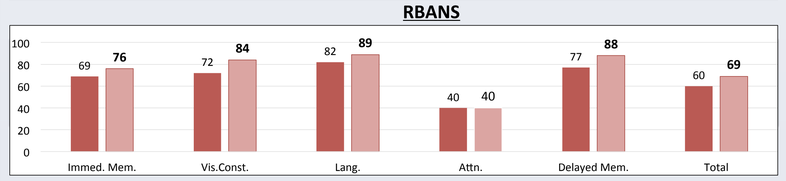

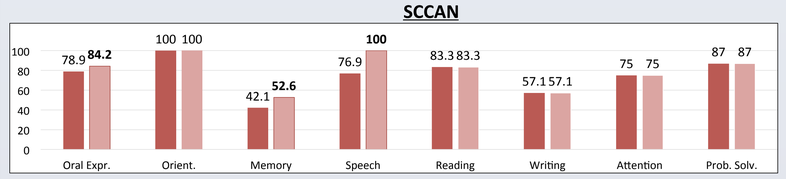

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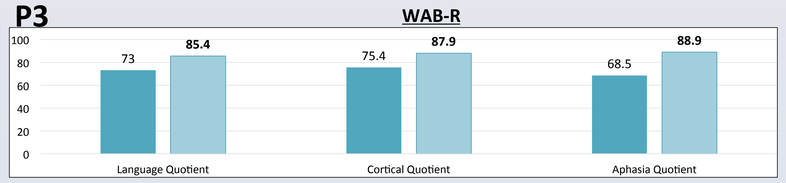

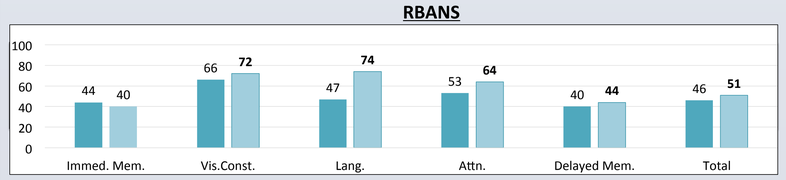

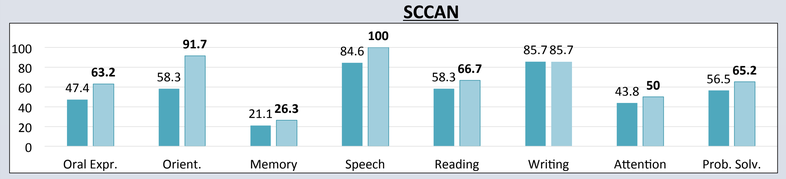

The control participant showed no significant changes on the WAB-R and RBANS. Changes were noted on four subtests of the SCCAN.

CONCLUSION

As a result of this intensive cognitive-communication rehabilitation (ICCR) program, individuals with ABI demonstrated gains in speech, language, and cognitive-communication skills (i.e., improved classroom/therapy performance and standardized assessment performance).