Training Compensatory Memory Strategies via the Telephone for Persons with TBI

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Abstract

- Spaced retrieval techniques were used over the telephone to train persons with traumatic brain injuries (TBI) to use compensatory strategies for everyday memory problems. Seven participants with borderline normal to mild global severity ratings were trained to use memory aids for prospective and episodic memory tasks. Results indicated that goal attainment and generalization can be achieved in an average of five 30-min training sessions resulting in 94% goal maintenance at 1-month.

Introduction

- Memory impairment post-TBI
  - Most *disabling* and persistent impairment
  - Prospective memory and new (conscious) learning are most impaired memory processes
  - Implicit learning is relatively spared
- Conventional Memory Interventions
  - Role-play, Cueing, Internal/External Memory Strategies
    - Place heavy demands on working memory
    - Cueing hierarchy subject to source confusion (multiple trials of incorrect information)
    - Limited evidence of generalization

Spaced Retrieval

- Practice at successfully recalling information over progressively longer intervals of time
  - Implicit memory requires little cognitive effort.
  - Client does not have an opportunity to make errors, so client does not learn the *wrong* answer.

Errorless Learning

- Shaping paradigm applied to memory
  Bjork, 1988; Camp & McKitrick, 1992; Landauer & Bjork, 1978
- Errorless learning is more efficient and produces more accurate learning than trial & error learning (Evans et al., 2000)
- Spaced retrieval produces greater goal mastery and maintenance than traditional least-to-most cueing hierarchy for people with dementia (Bourgeois et al., 2003)

Spaced Retrieval Efficacy

Effective across a variety of conditions:

Alzheimer's Disease	Camp et al., 1996; Moffat, 1989
Parkinson'sDisease	Hayden & Camp, 1995
Korsakoff's Syndrome	Camp & Schaller, 1989
Vascular and Mixed	Abrahams & Camp, 1993, Bird, et al. 1995
Post-anoxia dementia	Bird et al., 1995
CVA; stroke	Brush et al., 1997

Effective with a variety of goals:

Names of common objects	Abrahams & Camp, 1993
Face-Name associations	Camp & Schaller, 1989; Foss, 1994
Object-location associations	Camp & Stevens, 1990
Using a Calendar	Foss, Camp, & O'Hanlon, 1993; Stevens et al, 1993
New Motor Skills	Hayden & Camp, 1995
Remembering future action	Foss, Camp, & O'Hanlon, 1993 McKitrick, Camp & Black, 1992

Teletherapy Rationale

- Challenges to successful memory treatment for client with TBI:
  - Generalization and transfer of training from clinic to the everyday living setting
  - Reduced access to therapy due to transportation issues.
- Solution:
  - Train in the everyday living setting by delivering therapy by telephone!

Research Questions:

- Will Spaced Retrieval therapy be effective for training persons with TBI to use compensatory memory strategies?
- Can Spaced Retrieval therapy be delivered effectively over the telephone?
- Will there be evidence of generalized strategy use in daily life?

Participants: 7 individuals recruited from a Brain Injury Support Group

- Age 33-56 years
- Gender 3 males, 4 females
- TPI 2-21 years
- Mild Cognitive Deficits on standard tests
- Self-reported functional memory complaints
- Family-identified memory problems

Study Procedures: Clinic

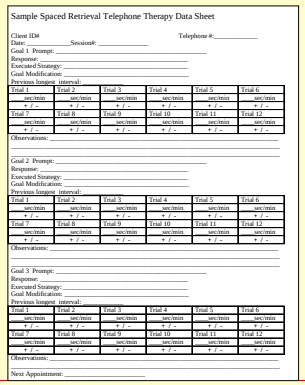
- Screening/assessment
  - Spaced Retrieval Screen (Brush & Camp, 1998)
  - Brief Test of Head Injury (Helm-Estabrooks & Hotz, 1991)
  - The Cognitive Difficulties Scale (McNair & Kahn, 1983)
  - Client/family interview
- Identify 3 functional memory related goals
  - Develop or modify external memory aid system if applicable
- Begin treatment on Goal 1 in clinic
- Schedule daily telephone calls

Study Procedures: Telephone

- Begin daily telephone sessions next day
- When correct response is given to the first prompt of session, begin next goal.
- Goal mastery: Correct response to first prompt of session for 3 consecutive sessions.
- Intervals: Conversation, activities, or other therapy goals. Current goal is not discussed.

Procedures: Spaced Retrieval

- Prompt provided by clinician
  - Prompt: "What do you do when you finish your cereal?"
  - Response: "Take something out of the freezer for dinner."
- Correct response
  - Must be immediate and exact.
  - Next prompt in 30 sec.
  - Double interval with each correct response.
- Incorrect response
  - Clinician immediately provides correct response
  - Client immediately repeats correct response
  - Reduce interval by half.



Sample Spaced Retrieval Telephone Therapy Data Sheet

Client ID# _____ Telephone #:_____

Date: _____ Session#: _____

Goal 1 Prompt: _____

Response: _____

Executed Strategy: _____

Goal Modification: _____

Previous longest interval: _____

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
sec/min	sec/min	sec/min	sec/min	sec/min	sec/min
+ / -	+ / -	+ / -	+ / -	+ / -	+ / -
Trial 7	Trial 8	Trial 9	Trial 10	Trial 11	Trial 12
sec/min	sec/min	sec/min	sec/min	sec/min	sec/min
+ / -	+ / -	+ / -	+ / -	+ / -	+ / -

Observations: _____

Goal 2 Prompt: _____

Response: _____

Executed Strategy: _____

Goal Modification: _____

Previous longest interval: _____

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
sec/min	sec/min	sec/min	sec/min	sec/min	sec/min
+ / -	+ / -	+ / -	+ / -	+ / -	+ / -
Trial 7	Trial 8	Trial 9	Trial 10	Trial 11	Trial 12
sec/min	sec/min	sec/min	sec/min	sec/min	sec/min
+ / -	+ / -	+ / -	+ / -	+ / -	+ / -

Observations: _____

Goal 3 Prompt: _____

Response: _____

Executed Strategy: _____

Goal Modification: _____

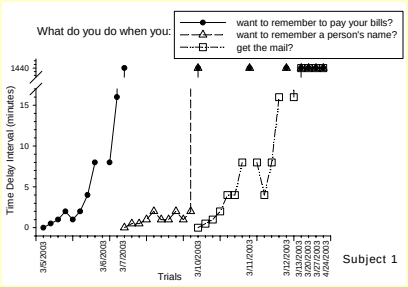
Previous longest interval: _____

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
sec/min	sec/min	sec/min	sec/min	sec/min	sec/min
+ / -	+ / -	+ / -	+ / -	+ / -	+ / -
Trial 7	Trial 8	Trial 9	Trial 10	Trial 11	Trial 12
sec/min	sec/min	sec/min	sec/min	sec/min	sec/min
+ / -	+ / -	+ / -	+ / -	+ / -	+ / -

Observations: _____

Next Appointment: _____

Example: Training Data



Types of Goals

- Facts — phone number and address
- Finances — look in planner to pay bills; pay rent last day of the month
- Learning — writing names, taking notes
- Organization — sorting mail, location for keys/wallet
- Time management — using planner, orienting to date/day
- ADL's — meal planning, laundry

Results

- Goal mastery
  - 20 of 21 goals (95%)
- Trials to mastery
  - Average of 14 trials per goal (range = 8-37)
- Sessions to mastery
  - Average of 5 sessions per goal (range = 4-14)

Maintenance

- 17 of 18 (94%) mastered goals were remembered at the 1-month follow-up call
- Only 1 client lost to follow-up (relocation)

Telephone Effectiveness

- Average of 2 missed phone calls per subject (range = 0-6)

Generalization

- Look in planner to pay bills
  - Pays bills on time; Bought new planner
- Take food out of the freezer
  - Planning meals to put in freezer;
  - Organized shopping list by store aisles
- Taking pill at halfway thru meal using cue card
  - Took pill at correct time at restaurant
- Sorting the mail and bills
  - Organized files and closets
- Reading date from calendar after breakfast
  - Says date at school without visual cue

Conclusions

- Performed better than clients with dementia who mastered 67% of goals attempted and required an average of 11 sessions to master goals. (Bourgeois et al., 2003)
- Treatment sessions can address multiple goals during spaced retrieval intervals
- Viable treatment option for clients with short term memory or learning impairments who are unresponsive to conventional training
- Telephone sessions make treatment more accessible and promote generalization by training in home/work environments