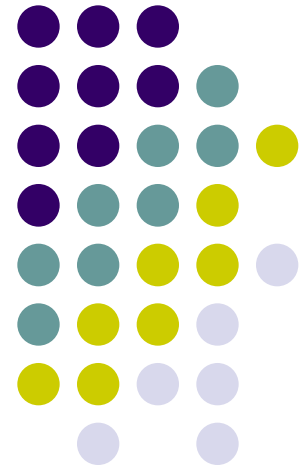


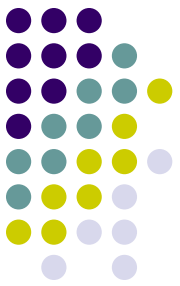
Interventions for Adults and Children with Attentional Difficulties

Presented by
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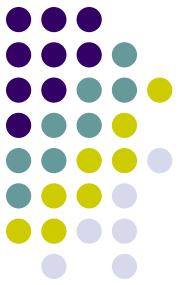
BRITISH COLUMBIA · CANADA





Importance of attention to neurorehabilitation

- Attention deficits common consequence of acquired brain injury
- Attention required to learn new tasks, and to perform routine activities
- Attention is important to problem solving and communication
- Predicts return to work and other functionally important activities



Attention and purposeful action

- cognitively unimpaired individuals made more errors performing routine actions concurrently with an attention-demanding secondary task compared to performing a routine task on its own

Humphreys (2000); Cicerone (1996)

The relationship of attention to functional action sequences



Attention test scores strongly predicted number of errors stroke individuals made while learning novel purposeful actions (e.g., making a caesar)

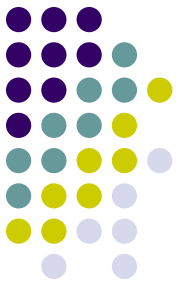
(Green, 2002)

The integrity of the attentional system has predictive power



Sustained attention performance at 2 months predicted functional status at 2 years in a sample of 47 right-brain damaged stroke patients

Attention Impairments



Changes in...

- Speed of processing
- Vigilance & maintenance of attention
- Freedom from distractibility
- Shifting attention
- Working memory

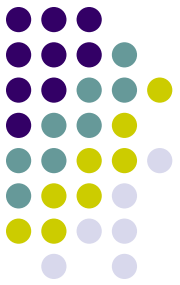
(Brooks & McKinlay, 1987; Mateer & Mapou, 1996;
Cicerone, 2002)

Intervention Approaches



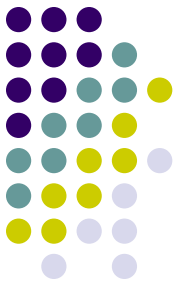
- Education about attentional difficulties
- Reducing physical factors affecting attention
- Direct training of attention processes
- Specific skills training
- Training of metacognitive strategies
- Environmental modification/task accommodation
- Training use of external aids

Measuring the effectiveness of interventions



- Changes in performance of cognitive measures
- Functional/behavioral improvement attributable to treatment
- Evidence of generalization to untrained but relevant tasks
- Self and/or other report of changes in functioning
- Improved self-report of adjustment to difficulties
- Evidence of changes in brain functioning

Effects of an educational intervention



- Mittenberg et al, 1996
 - 29 Ss with MTBI (Mean GCS=14.86)
 - Treated group given ten page manual - Recovering from Head Injury: A guide for patients (Mittenberg, Zielinski & Fichera, 1993)
 - Compared to untreated patients, treated patients showed
 - significantly shorter symptom duration
 - fewer symptoms at 6 months
 - fewer symptomatic days
 - lower average symptom severity levels

Cog/Beh Prevention of PCS

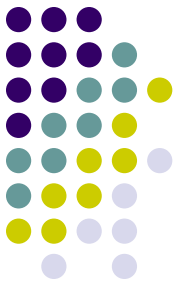


Mittenberg et al. (1996)

% of initially symptomatic patients who continued to report specific symptoms 6 months post injury

	Control	Treatment
● Headache	86%	44%
● Fatigue	82%	47%
● Memory	80%	38%
● Concentration	80%	29%
● Anxiety	58%	38%
● Depression	56%	27%
● Dizziness	50%	36%

Important early messages

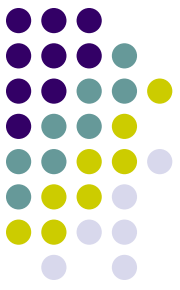


- Normalize symptoms and provide a realistic explanation as to their bases
- Regulate lifestyle/environment to avoid problems
- Recognize early signs of stress and take steps to reduce it
- Develop compensations - reduce overall workload, introduce a diary



Address physical conditions that may affect attention

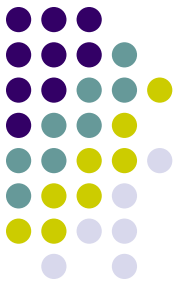
- Sleep disorders
- Headache
- Neck and back pain
- Tinnitus
- Dizziness and balance



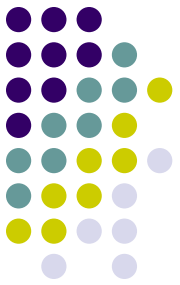
Restorative interventions designed to improve attention skills

- Practice tasks require increasingly more demanding attentional skills
- A variety of stimuli and tasks
- Hierarchically organized, theoretically driven
- Types of attention treated: sustained, selective, alternating, divided
- Task performance measured and feedback provided

Compensatory interventions designed to improve specific skills

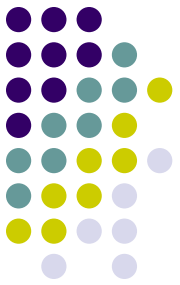


- Driving requires attention to keep track of many things and to shift focus
- Experimental group – shaping to train ABI patients using an electric-powered vehicle
- Control group – same amount of time in vehicle, but no specific training
(Kewman, et al, 1986)

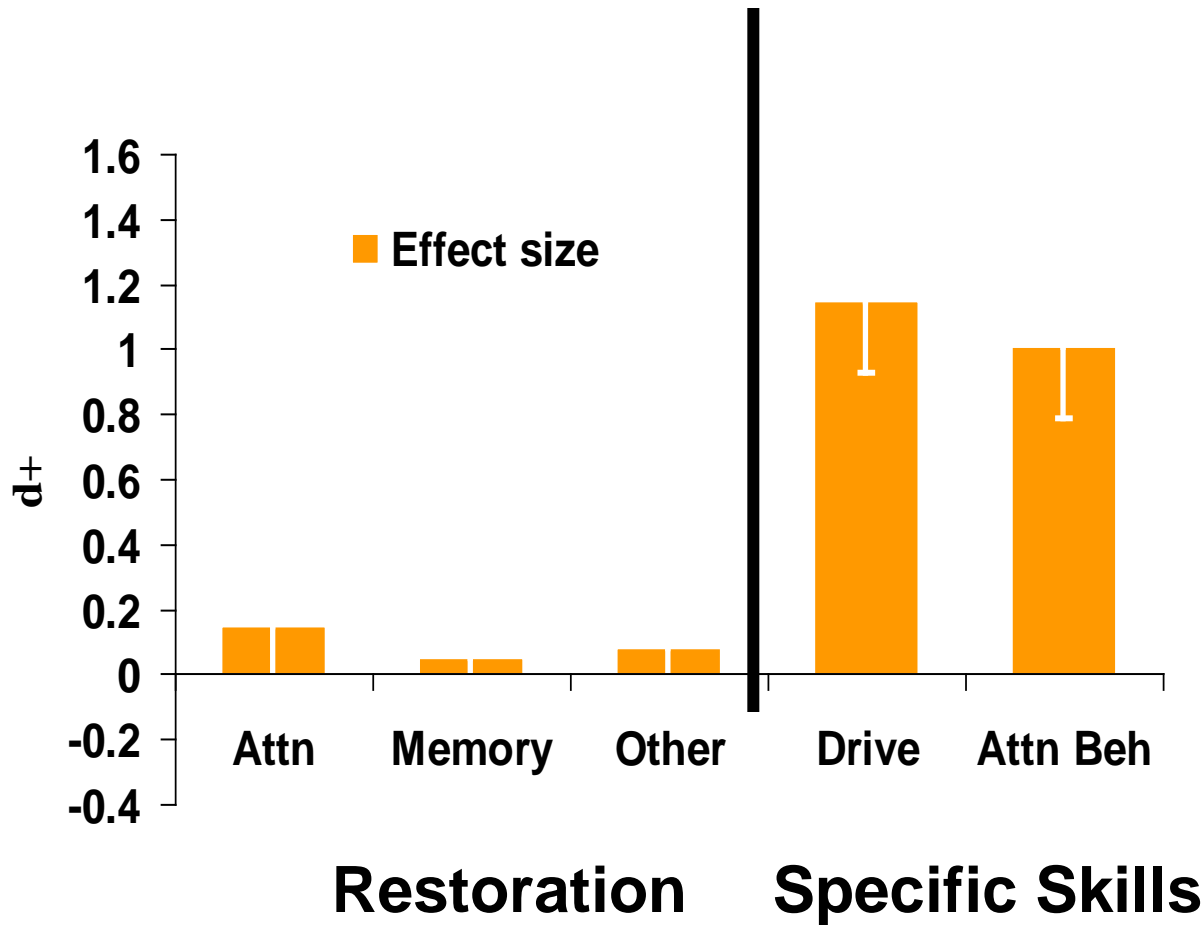


Park & Ingles (2001)

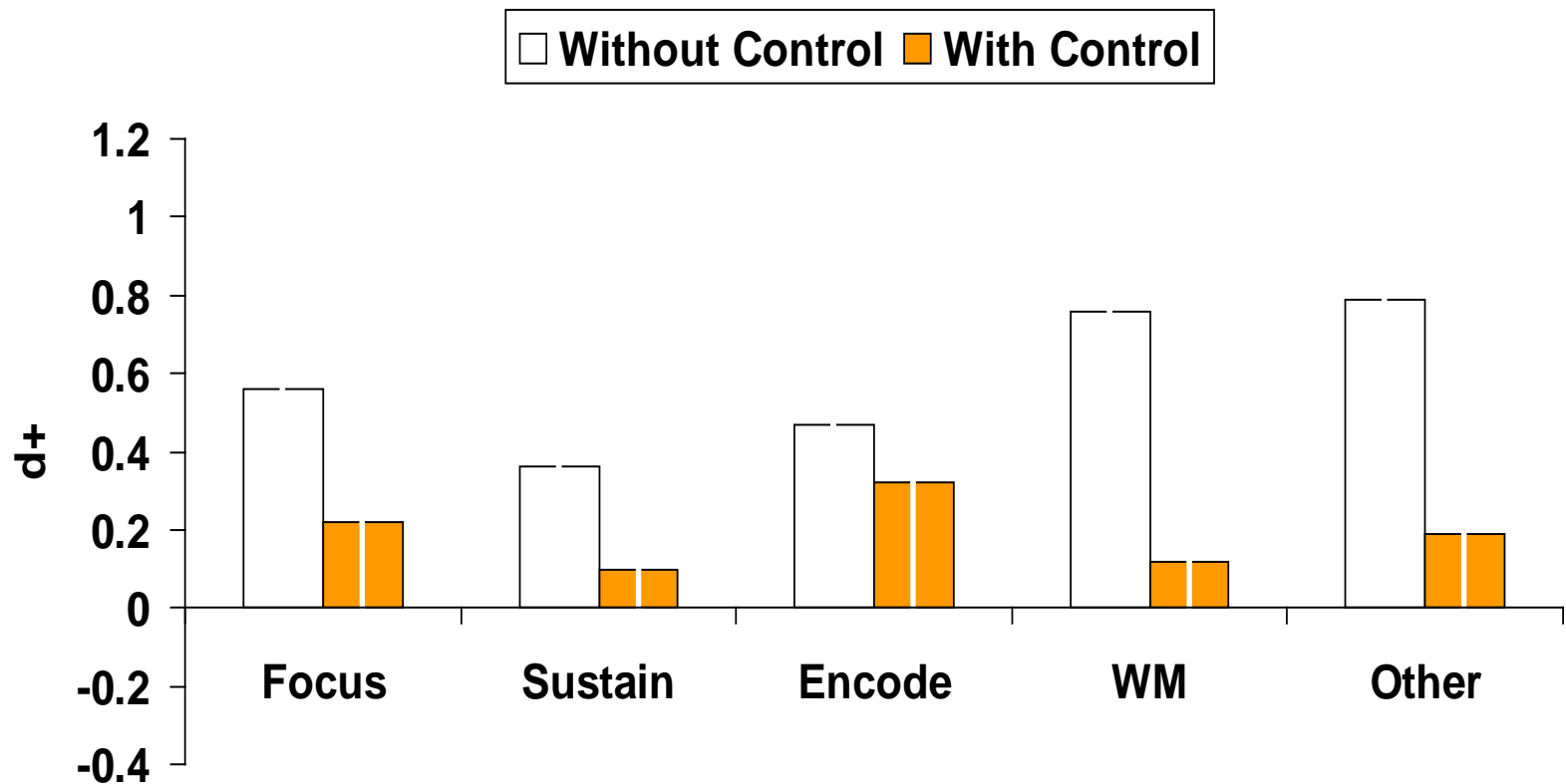
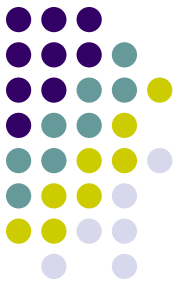
- Meta-analysis of intervention studies for general attention disorders
- 30 studies (359 participants)
 - 26 restoration
 - 4 specific-skills training (e.g., driving)



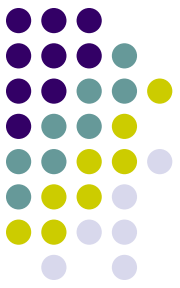
Improvement after Training



Performance after Training on Attention Measures



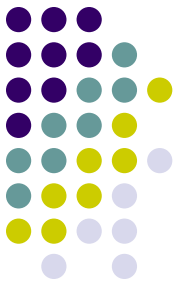
Conclusions/Implications



- Restorative and compensatory approaches are difficult to compare using the same metric
 - Interventions designed to improve attention may have smaller effect sizes but a broader impact
 - Park & Ingles meta-analysis included highly variable tasks/goals/subjects in the “restorative” studies
 - Compensatory training approaches can be very effective for targeted skills, but are difficult to manage logistically and are less likely to generalize to other skills

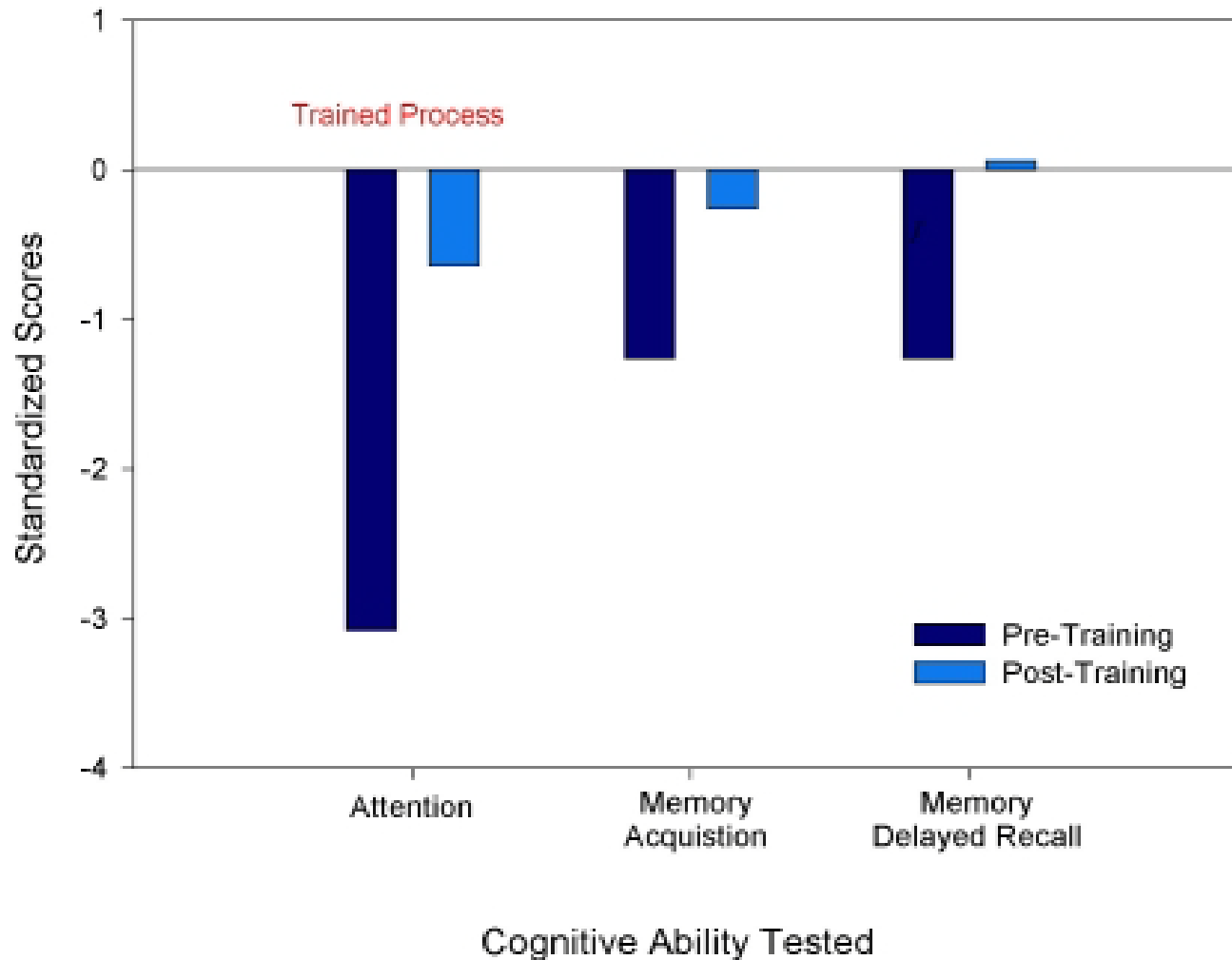
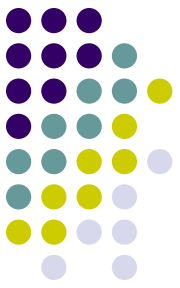
For example:

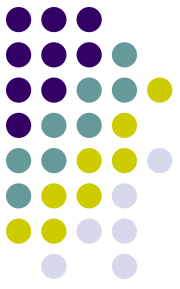
Importance of initial state of arousal



- Sturm et.al, 1997
- Stroke patients with good basic arousal benefited from both simple and complex attention training
- Stroke patients with low level of arousal benefited from basic level attention training, but not more complex levels
- When basic attention is poor, training at complex levels alone had no affect or actually decreased attention

Memory Changes Following Attention Training (Mateer, 1989)





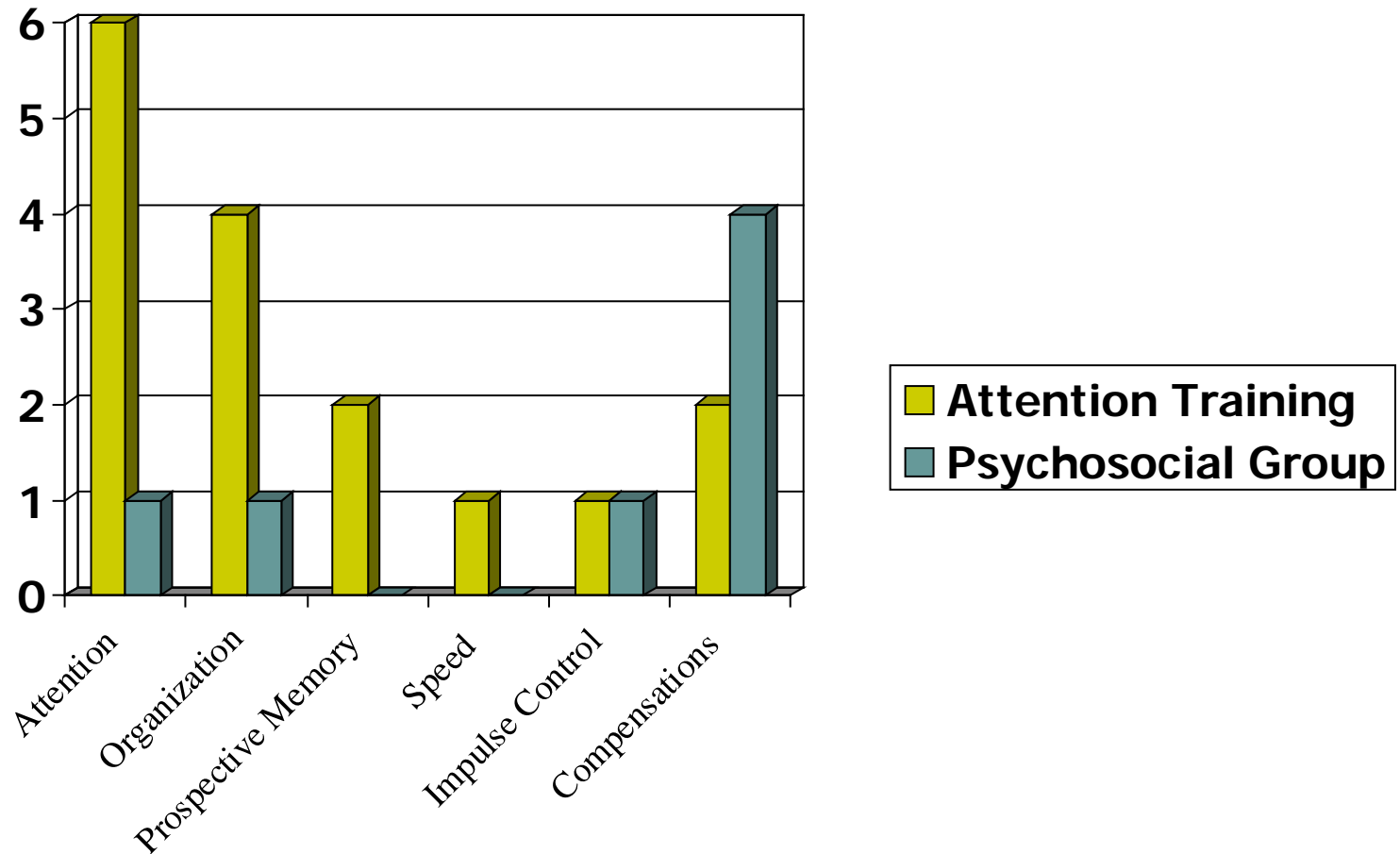
Multiple goals of rehabilitation: Cognitive skills & Adjustment

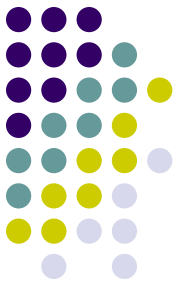
Usually cognitive and adjustment oriented interventions are treated separately, but

Is there a differential impact?

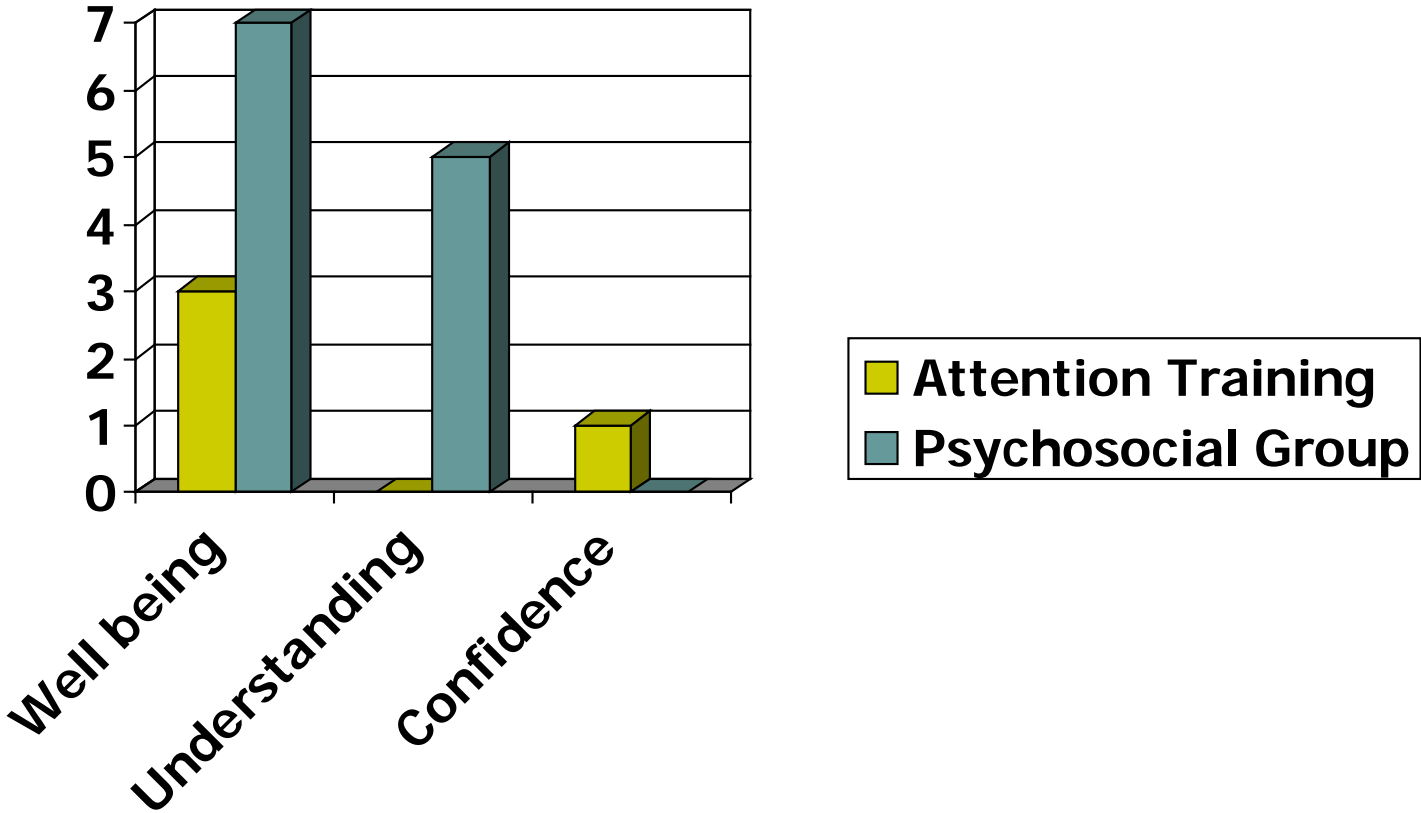
(Sohlberg et al, 2001)

Cognitive Changes Associated with Two Types of Intervention





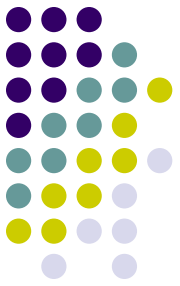
Psychosocial Changes Associated with Two Types of Intervention



Melding interventions



Implementing a cognitive behavioral
treatment approach



Memory self-efficacy

- An individual's beliefs about
 - Their own memory capacity
 - How much memory had changed
 - The degree to which memory performance is under personal control

Why are self-efficacy beliefs important?



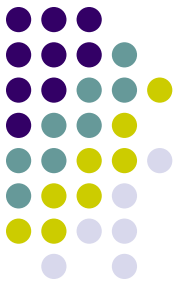
- Influence level of motivation an individual is willing to put forth on a task
- Higher processing effort produces better performance

Using CBT to address adjustment to cognitive impairment



- Educate regarding the interplay between attention and self-efficacy beliefs
- Practice underlying cognitive skills
- Promote self-regulation of emotional response to frustration and failure
- Foster re-establishment of a sense of mastery over the environment and oneself

Principles of intervention



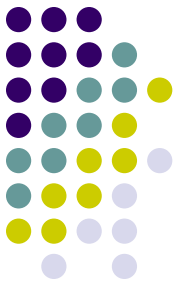
- Focus on everyday function
- Adopt mutual goal setting
- Engage family and significant others
- Knowledge, skills, practice, implement

APT – Attention Questionnaire



- Rate the level of difficulty one is experiencing in different domains of attention on a 5-point scale from *Not a problem* to *A problem all the time*
- Ratings are done on 14 items, e.g.,
 - I seem to lack mental energy*
 - I can only concentrate for short periods*
 - I am easily distracted*
 - I have difficulty paying attention to more than one thing at a time*

(Ponsford, 1998)



Attention Rating and Monitoring Scale
(ARMS) allows rating frequency of attention
symptoms using five point scale

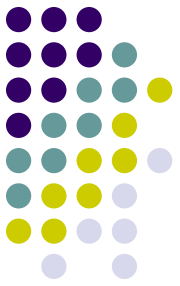
(Cicerone, 2002)

Develop individualized attentional problem list



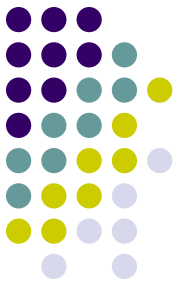
- Describe a specific example of a attentional failure
 - *I got overloaded in a meeting. I lost my ability to follow what was going on. I panicked.*
- Describe what you do when it occurs
 - *I had to escape. I just got up and left the room. I didn't know what to tell my boss so I didn't say anything.*

Practice APT and Functional Attention Tasks

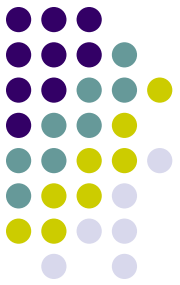


- Focused attention
- Simple sustained attention
- Complex sustained attention
- Selective attention
- Alternating attention
- Divided attention

General education in self-regulation of attentional difficulties



- Take advantage of peak times
- Use orienting procedures
- Pace yourself
- Alternate easy and difficult tasks
- Take breaks – don't push yourself
- Slowly increase amount of time on tasks
- Reserve enough time to complete a task



Manage the Environment

- Task management strategies
 - Reduce distractions
 - Select facilitating environments
- Environmental modifications
 - Posted reminders
 - Message centers
 - Use of external aids

Attention Lapse Log



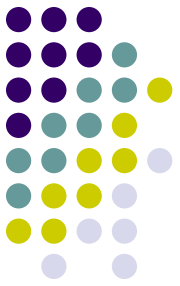
Date/Time	Describe Lapse in attention	What did (or could) you do to manage lapse?
<i>Monday 8:00am</i>	<i>Burnt pancakes</i>	<i>Don't leave kitchen</i>
<i>Tuesday 1:00pm</i>	<i>Forgot what tool I went to get</i>	<i>Write it down, say it to myself</i>
<i>Tuesday 5:00pm</i>	<i>Didn't stop at store, record mileage</i>	<i>Put post-it on dash</i>

Attention Success Log



Date/Time	Describe attention success	Why were you successful?
<i>Monday 9:00am</i>	<i>Cleaned and reassembled chainsaw</i>	<i>Stuck with 1 task, no distractions</i>
<i>Tuesday 3:00pm</i>	<i>Remembered to make phone calls; didn't quite when I wanted to</i>	<i>Made a list, set aside enough time, quiet</i>

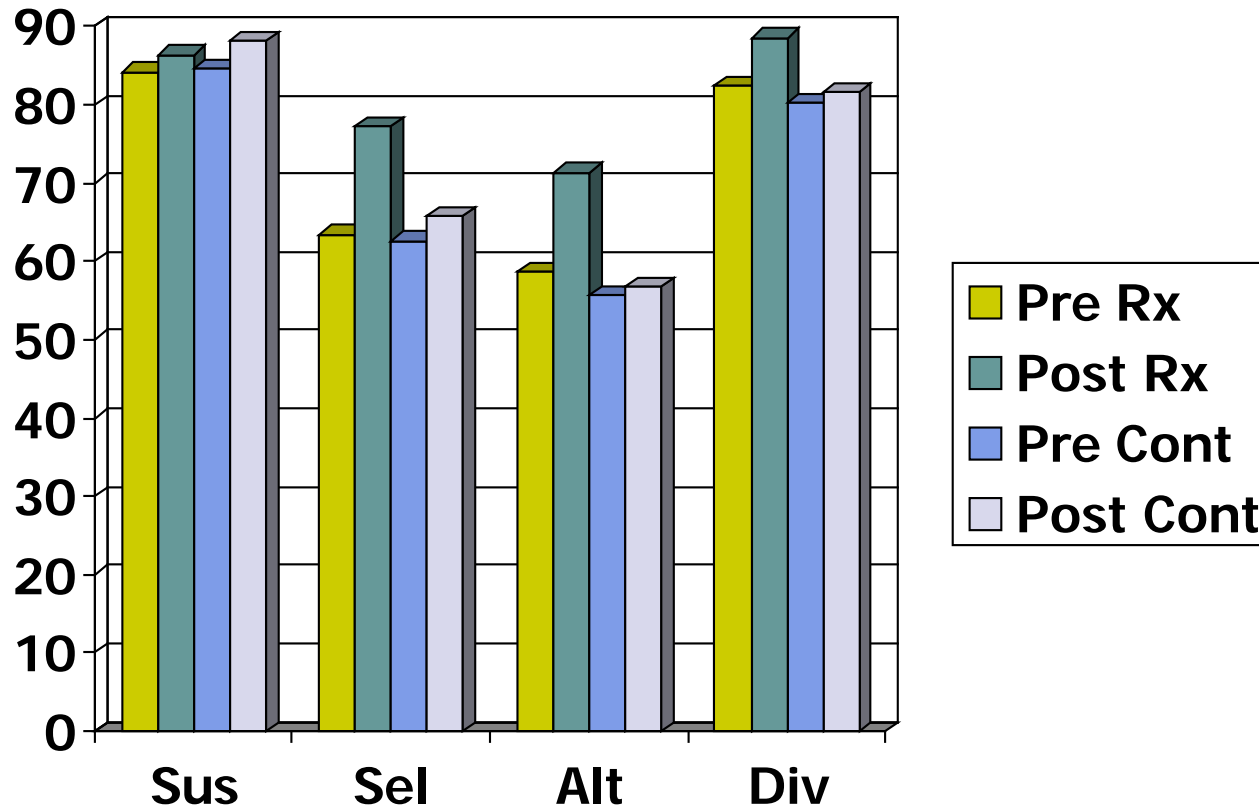
Generalization Exercises



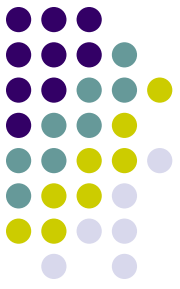
- Sustained attention
 - e.g., set aside study time each night
- Selective attention
 - e.g., pay bills with tape of children playing in the background; record irritation rating
- Alternating attention
 - e.g., alternate between filing, typing forms and answering phones at work

Treatment Outcomes on APT Test

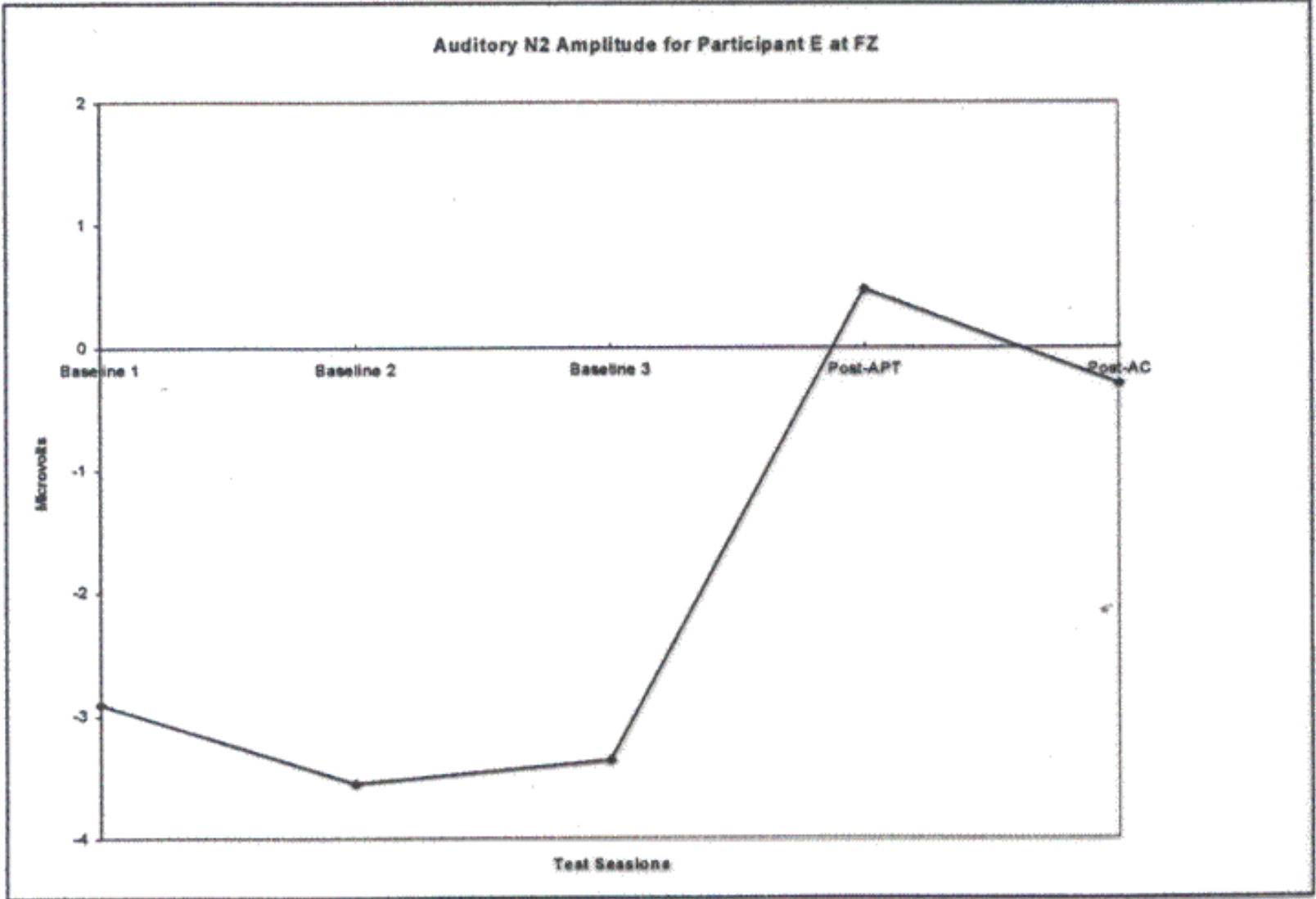
(Raskin & Buckeit, 2000)



Evidence for changes in emotional state



- Post-training changes following APT training on the MMPI
 - Reduction on Scale 2 (depression)
 - Reduction on Scales 7 and 8 (anxiety and disorganized thinking)





Metacognitive Strategy Training

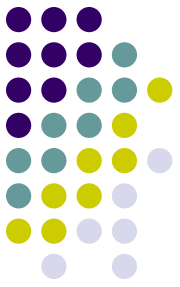
- Emphasize behavioral methods to train specific attention skills
- Help individuals achieve internalization of strategies for controlling and monitoring attention

MCSTraining Specific to Attention



- Self instructional statements to use when attention drifts (Webster & Scott, 1983)
- Reducing attentional slips while reading (Robertson, 1991)
- Time Pressure Management (Fasotti et al., 2000)
- Cognitive Rehabilitation Program (Butler & Copeland, 2002)

Memory interventions: External memory aids



- Reminding devices
 - Stand alone
 - watches
 - voice recorders
 - key finders, car locators
 - Interfaced with computer
 - Timex data link watch, Palm Pilot, Visor
 - Interfaced with paging systems, telephone, cable, internet
 - Palm Pilot, Visor, Blueberry
 - Notebooks, sticky notes, calendars