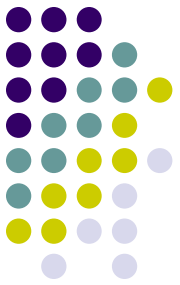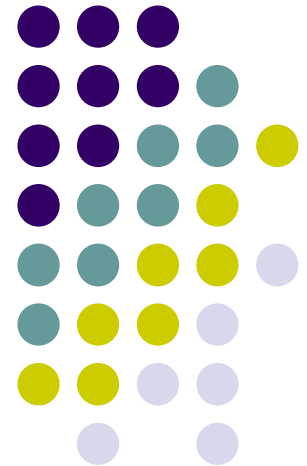# Interventions for Adults and Children with Attentional Difficulties

Presented by

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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
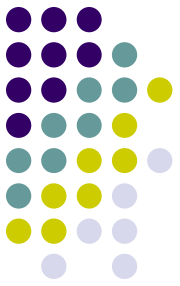- Freedom from distractibility
- Shifting attention
- Working memory

(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

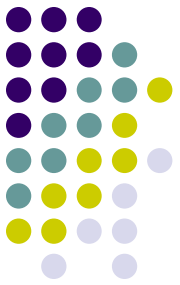# Measuring the effectiveness of interventions

- 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
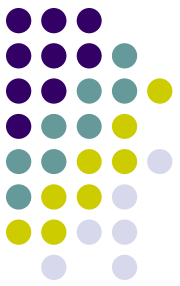
Effects of an educational intervention

- ## 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
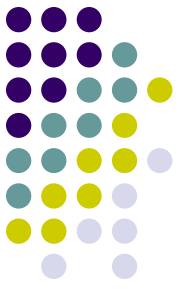
Address physical conditions that may affect attention

- Sleep disorders
- Headache
- Neck and back pain
- Tinnitus
- Dizziness and balance
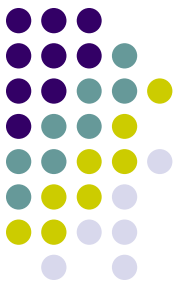
Restorative interventions designed to improve attention skills

- 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
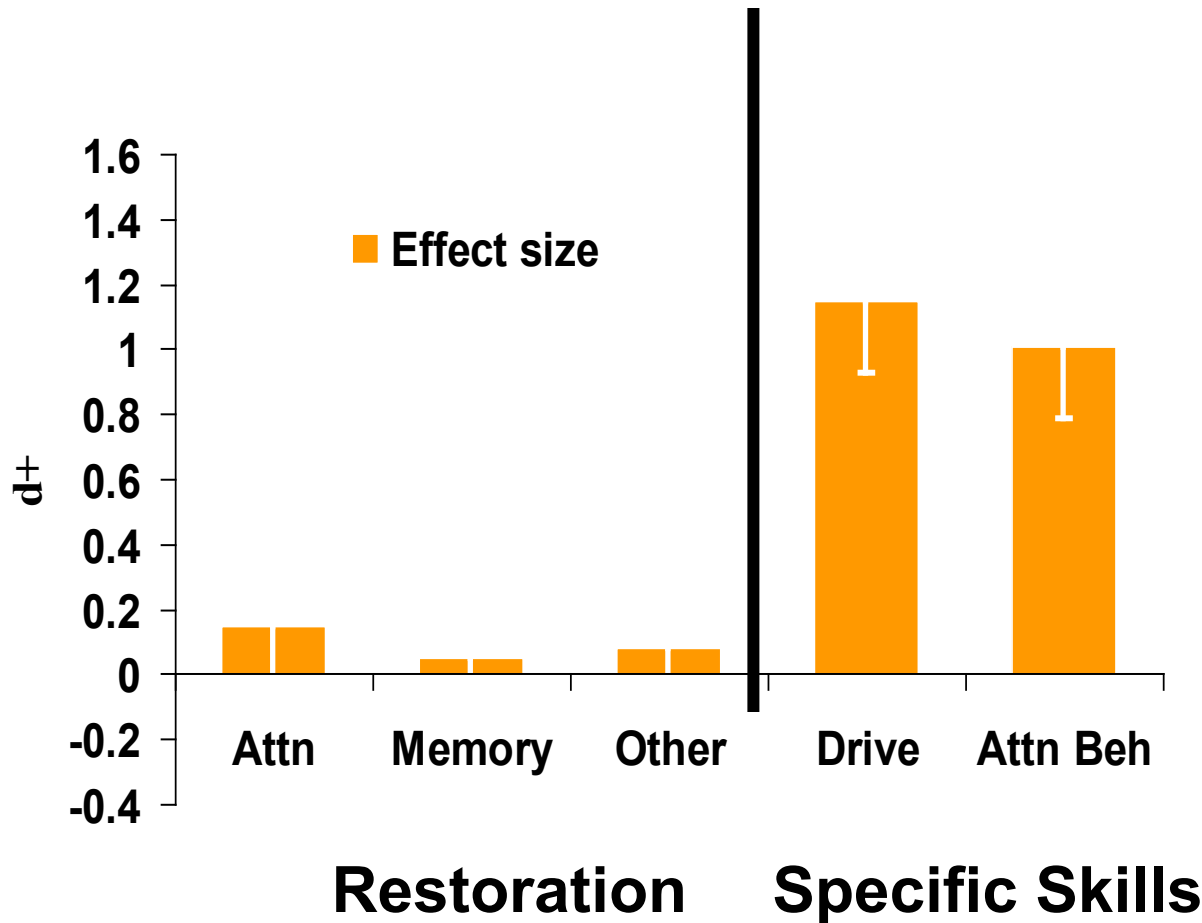
    (Kewman, et al, 1986)
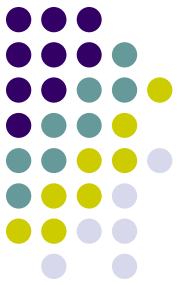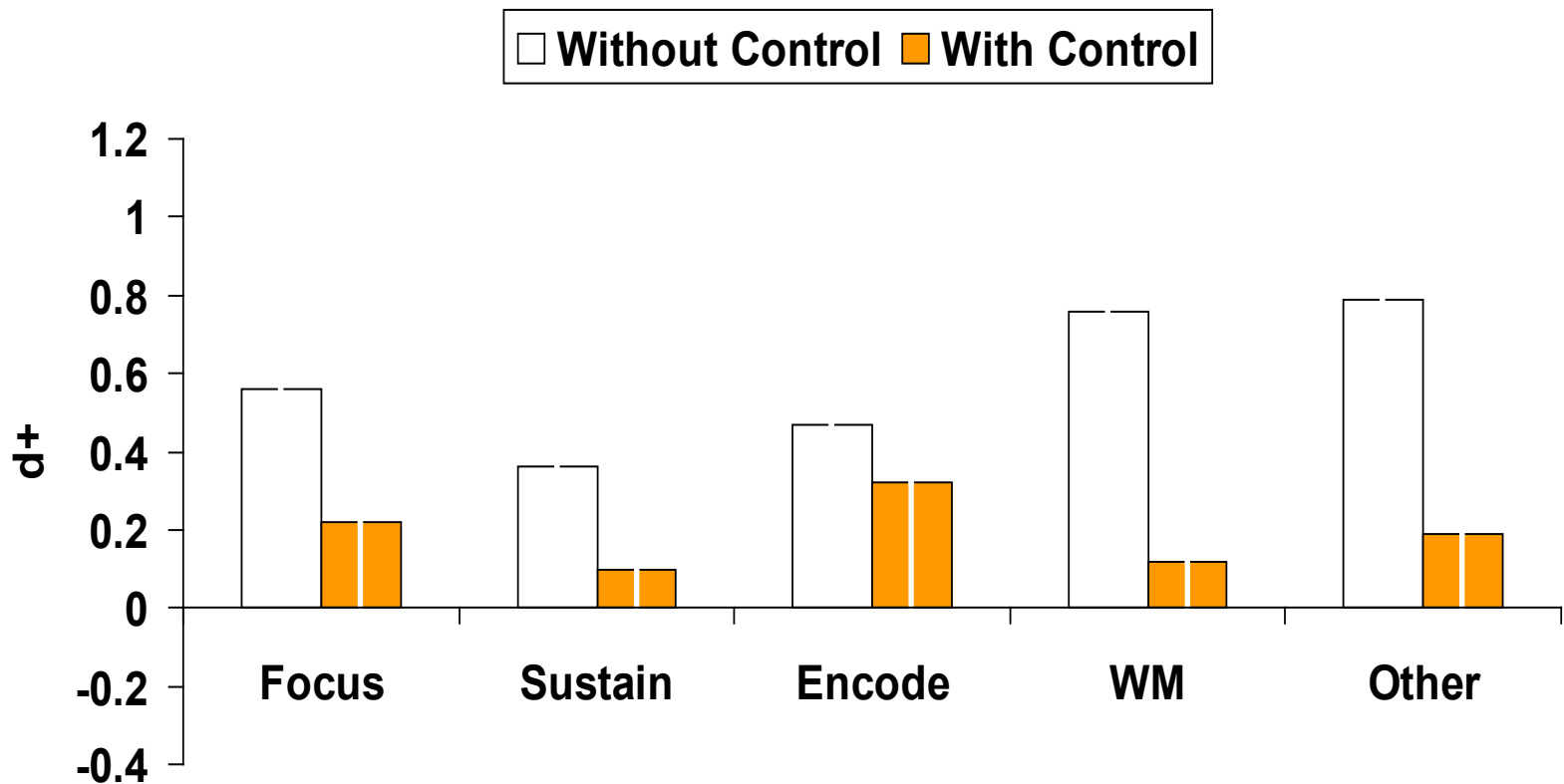
Park & Ingles (2001)

- Meta-analysis of intervention studies for general attention disorders

- 30 studies (359 participants)

  - 26 restoration
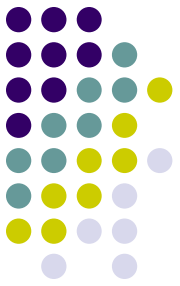
  - 4 specific-skills training (e.g., driving)
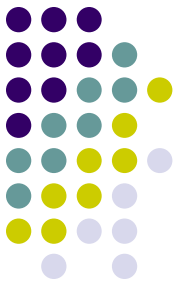
Improvement after Training

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)
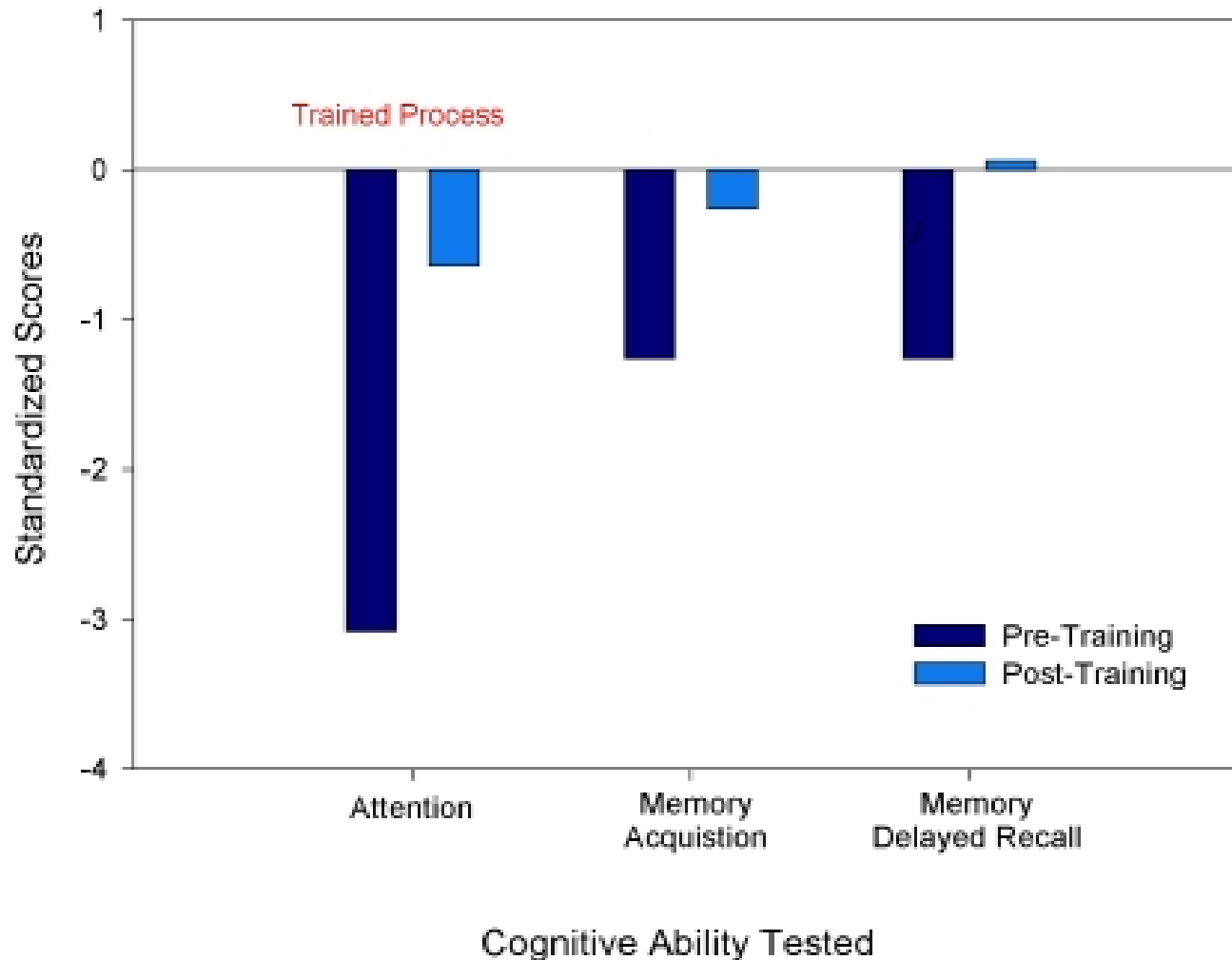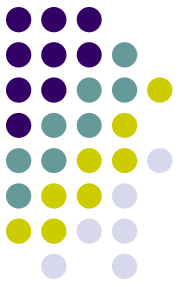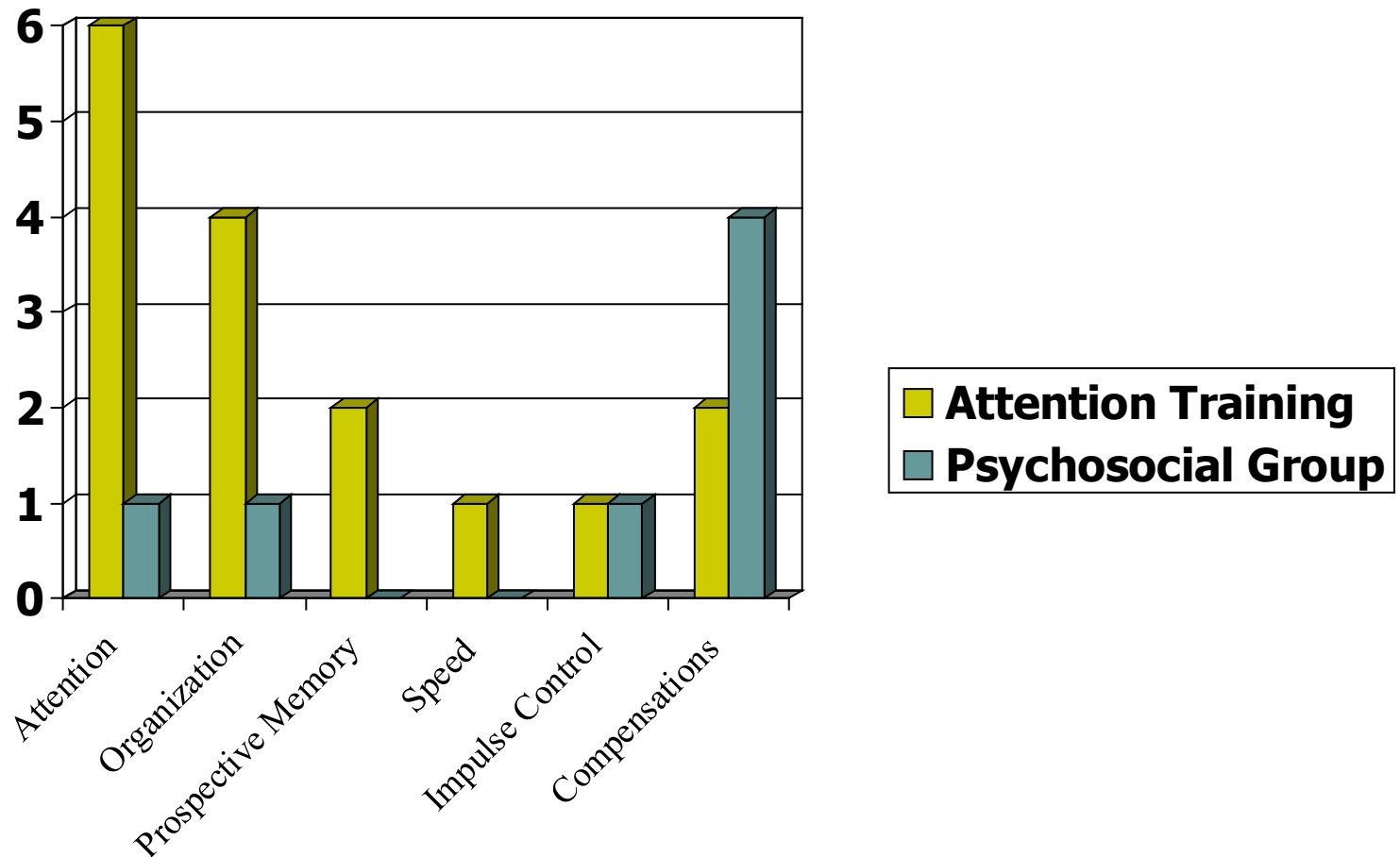
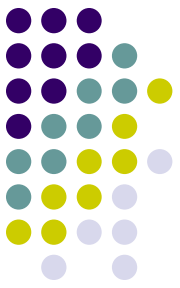# Multiple goals of rehabilitation: Cognitive skills & Adjustment

Usually cognitive and adjustment oriented interventions are treated separately, but
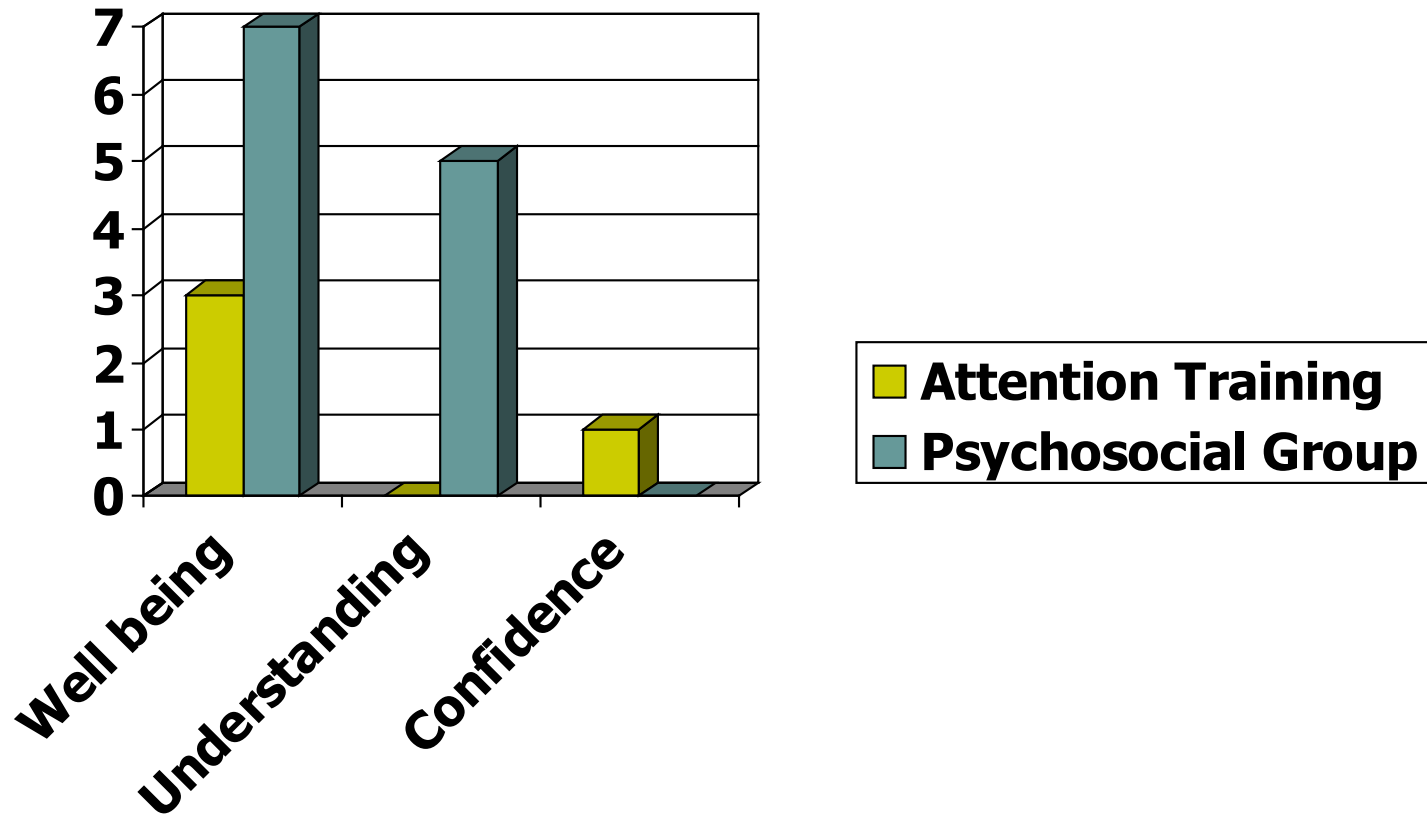
Is there a differential impact?

(Sohlberg et al, 2001)

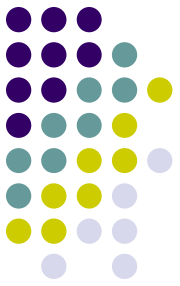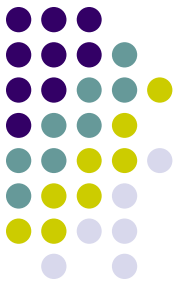# Cognitive Changes Associated with Two Types of Intervention

Psychosocial Changes Associated with Two Types of Intervention
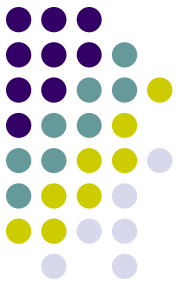
Melding interventions

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

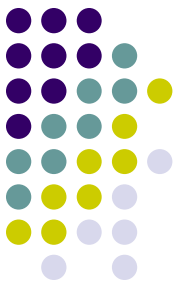 *I have difficulty paying attention to more than one thing at a time*

(Ponsford, 1998)
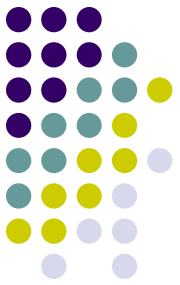
Attention Rating and Monitoring Scale (ARMS) allows rating frequency of attention symptoms using five point scale

(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 paniced.*

- 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.*

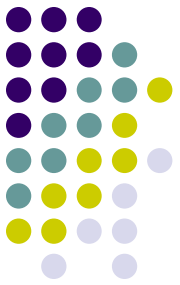# **Practice APT and Functional Attention Tasks**
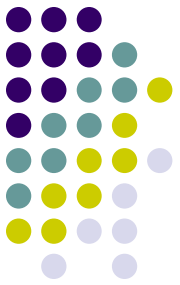
- Focused attention
- Simple sustained attention
- Complex sustained attention
- Selective attention
- Alternating attention
- Divided attention

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?
Monday 8:00am	*Burnt pancakes*	*Don't leave kitchen*
Tuesday 1:00pm	*Forgot what tool I went to get*	*Write it down, say it to myself*
Tuesday 5:00pm	*Didn't stop at store, record mileage*	*Put post-it on dash*

Attention Success Log

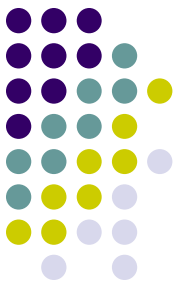| Date/Time	Describe attention success	Why were you successful?
Monday 9:00am	*Cleaned and reassembled chainsaw*	*Stuck with 1 task, no distractions*
Tueday 3:00pm	*Remembered to make phone calls; didn't quite when I wanted to*	*Made a list, set aside enough time, quiet*

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
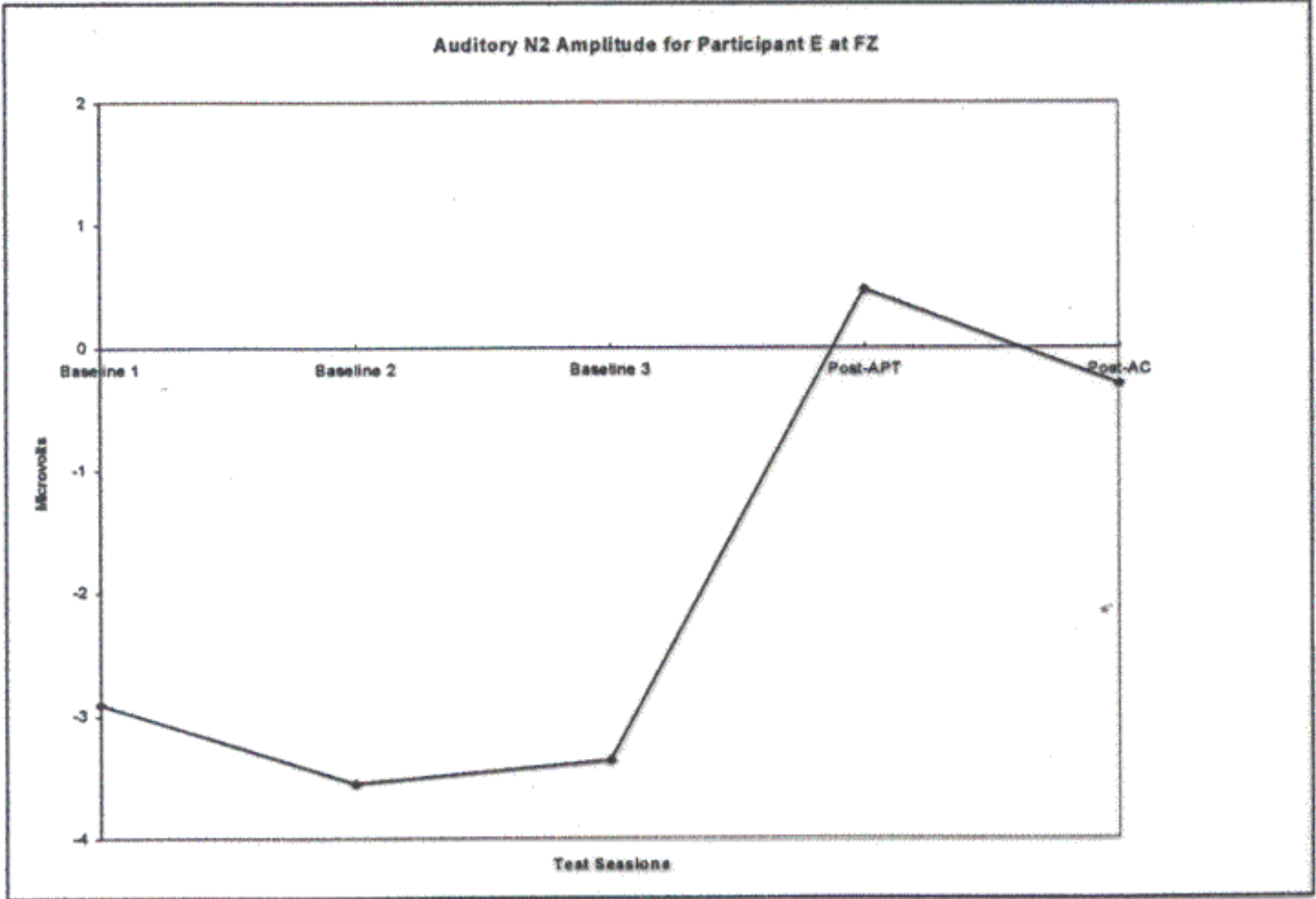
Treatment Outcomes on APT Test
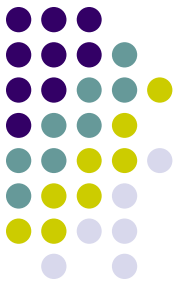
(Raskin & Buckeit, 2000)
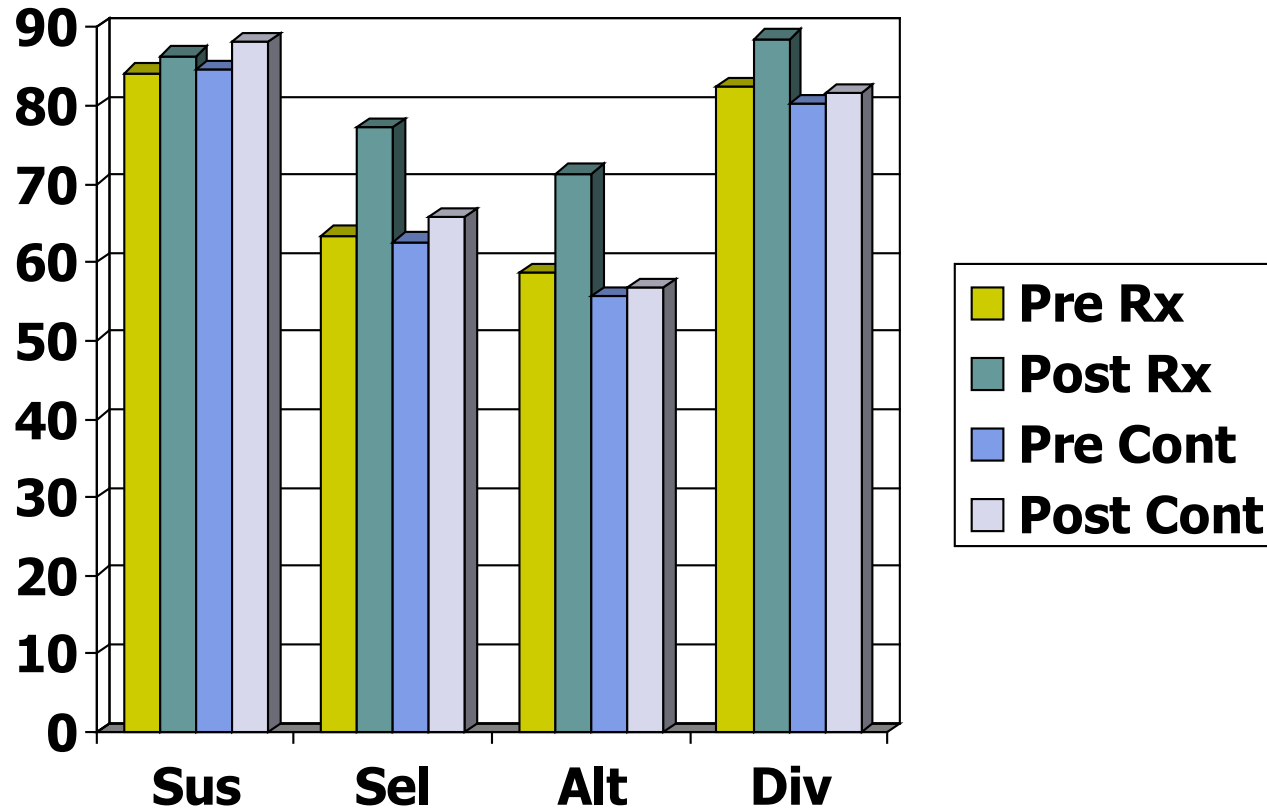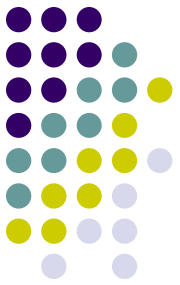
Evidence for changes in emotional state

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

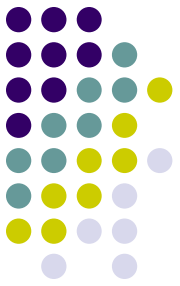Auditory N2 Amplitude for Participant E at FZ

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