Cognitive Adaptation Training: Improving Outcomes in Serious Mental Illness

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Negative Symptoms
- Affective blunting
- Poverty of speech
- Amotivation
- Decreased activity
- Social withdrawal

Community Functioning/Behavior
- Work/School
- Interpersonal relationships
- Self-care/activities of daily living
- Medication adherence

Cognitive Deficits
- Attention
- Memory
- Executive functions

Comorbid Conditions
- Mood
- Substance abuse
- Anxiety

Schizophrenia: Signs and Symptoms Related to Outcome

Positive Symptoms
- Delusions
- Hallucinations
- Disorganized speech/behavior

Cognitive Adaptation Training:

Neuropsychological Profile for Patients with Schizophrenia

ABS = abstraction; VBL = verbal cognitive; SPT = spatial organization; SME = semantic memory; VME = visual memory; LRN = language; VSM = visual-motor processing and attention; AUD = auditory processing and attention; MOT = motor speed and sequencing.

MAPTICS Taxonomy of Cognition

- Attention/Vigilance
- Speed of Processing
- Working Memory
- Executive Functioning / Reasoning and Problem Solving
- Verbal Learning and Memory
- Visual Learning and Memory
- Social Cognition

Continuous Performance Test Identical Pairs Version

Misses
False Alarms


California Verbal Learning Test

Let’s suppose you were going shopping. I’m going to read a list of items for you to buy. Listen and when I’m through, I want you to say back as many of the items as you can.
drill
plums
vest
parsley
grapes
paprika
sweater
wrench
etc.

Assesses verbal memory, the ability to recall, to recognize previously learned information, and to use contextual cues.

Executive Functions

- Initiation and inhibition
- Cognitive flexibility
  - Planning
  - Problem solving
  - Judgment

Wisconsin Card Sort

Tests cognitive flexibility and problem-solving


Trails B


Verbal Fluency

Please tell me all the words you can that begin with the letter “C”

<table>
<thead>
<tr>
<th>Perseveration</th>
<th>Apathy</th>
<th>Disinhibition</th>
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<tbody>
<tr>
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Cognitive Deficits Predict Functional Outcomes

Executive Function → ADLs
Attention → Social Function
Memory → Work
Psychomotor Speed

ADLs = activities of daily living.


Interventions for Cognitive Deficits

- Cognitive Remediation
  - Cognitive Enhancement Therapy
  - Neurocognitive Enhancement Therapy
- Compensatory strategies/environmental supports
Cognitive Enhancement Therapy vs Enhanced Supportive Therapy

- 60 hours of computer training in attention, memory, and problem-solving
- 45 session weekly social-cognitive group that focuses on learning how to take the perspective of others, reading non-verbal cues, and managing emotions


Neurocognitive Enhancement Therapy (NET)

- NET components
  - Cognitive exercises for up to 5 hours a week for 26 weeks
  - Feedback from an assessment of cognitive function as it related to work delivered in the support group
  - A weekly social information-processing group
- Results indicated more hours worked in VA work programs and more earned in NET vs control conditions


Environmental Supports Can Reduce the Problems Caused by Cognitive Impairment

- Executive Function
  - Performance of ADLs
  - Social Function
  - Occupational Function


Glasses Reduce Problems in Functioning Associated with Poor Vision

- Poor Vision
  - Difficulties in: Reading, Driving, Interpreting Facial Expression, Playing Sports
  - Glasses


Executive Functions

- Formulate plans for goal-directed behavior
- Sequence behavior and thought
- Maintain goal-directed action in the face of distraction
- Inhibit irrelevant or inappropriate behavior

Better and Poorer Executive Functioning

Better
- General—How do I look
- More complicated activities—work, social life
- Smaller signs and cues
- Need help in few areas
- Can participate more

Poorer
- Specific—Comb hair, tuck in shirt
- More basic daily living—grooming, dressing
- Big signs and cues
- Need help in many areas
- Need trainer to suggest

Deficits in Executive Function

- Apathy
- Disinhibition
- Mixed

Behaviors Associated with Impaired Executive Function

Dressing Behavior: Apathetic Profile
- Stays in day clothes to sleep
- Does not complete dressing steps adequately (e.g., shoes untied, shirt incorrectly buttoned, fly unzipped)
- Stays in pajamas all day

Dressing Behavior: Disinhibited Profile
- Wears multiple layers of clothing
- Wears clothing that is too small, torn, or soiled because it is in the closet
- Wears clothing inappropriate for weather or scheduled activity
- Wears clothing or accessories in an inappropriate manner
- Skips important steps in dressing due to distraction from irrelevant stimuli

Taking the Bus

- May ride the bus to the end of the line and not get off at their stop. May miss the bus because they couldn't get going.
- May be late for the bus because they have misplaced necessary objects (e.g., keys). May get off the bus at the wrong stop following someone else. May get distracted by store windows or people on the way to the bus.
- May show behaviors listed under both apathy and disinhibition. Once on the way to the bus, they may get distracted.

Different Roads to the Same Behavior
- Someone may not use soap in the shower because she doesn’t start a behavior unless prompted (apathetic) or because she becomes distracted by objects in the shower so that she misses steps in showering (disinhibited)
- Someone may wear dirty clothes because he doesn’t change clothes (apathy) or because the clothes he took off last night are the first thing he sees when he gets out of bed in the morning (disinhibited)
- Someone may not take their medication because it was all the way over in the kitchen (apathy) or because they got distracted by papers on the counter when they were walking toward their medication and started picking up the counter (disinhibited)

Cognitive Adaptation Training (CAT)
- Manual—lists environmental supports
- Uses signs, calendars, checklists, and reorganization of belongings to cue and sequence behaviors in the home or work environment
- Treatment is based upon how the person thinks and behaves (executive function and behavior)
CAT Principles

- Deficits in executive function, attention, and memory
- Deficits in executive function lead to apathy or disinhibition
- Knowledge of executive impairment, functional deficits, and overt behavior lead to target interventions
- Adapted for deficits/strengths in attention, memory, fine motor skills
- Interventions best applied in real-life settings in relation to real-life problems

3 Steps to CAT Treatment Planning

- Step 1: Comprehensive assessment
- Step 2: Treatment planning form
- Step 3: Specific problem form

CAT Assessments

- Cognitive Function—Attention, Memory, Executive Functions, Fine Motor
- Overt Behavior—Frontal Systems Behavior Scale
  - Rates behavior on a series of scales based on frequency
  - Produces scores for Apathy and Disinhibition
- Environmental and Functional Assessment—EFA
  - Activity-by-activity schedule of the patient's typical day
  - Safety, organizational, or cleanliness problems during a tour of the living environment
  - Possession, placement, and use of certain critical items

General Intervention Strategies for CAT

Based upon level of executive functioning overt behavior

Apathy—Prompting and cueing to complete each step in a sequenced task
Disinhibition—Removal of distracting stimuli and cues for inappropriate behavior
Mixed—Both prompting of steps and removal of distracting stimuli

Poor Executive Function—Cues must be larger, more proximal, more numerous
Fair Executive Function—More subtle cues, less proximal

General interventions are adapted for strengths or weaknesses in specific areas of cognitive functioning (eg, attention, memory)

Prior to Intervention:

Dresser and Drawers

Prior to Intervention:

Shelves
Interventions Used in CAT

Apathy Disinhibition Mixed

CAT Intervention for Dressing

Problems with Orientation

Intervention for Medication Adherence

Making It Easy to Take Medication

Disinhibition—Fair Executive Function

- Decreasing the number of steps needed to take medication increases the likelihood that it will be taken.

- For problems with attention—signs or checklists are printed in fluorescent colors and the colors of the signs are changed weekly.

- Memory Deficits
  - Apathy—cue with voice alarm or checklist.
  - Disinhibition—Use a sign to remind the patient to check whether they have taken medication. Use separate containers for each day or dose time.
Dental Hygiene: Apathy, Poorer Executive Function

**Brush Teeth Everyday**

Prior to Intervention

Prior to Intervention

Prior to Intervention

Prior to Intervention

**CAT Intervention**

After Intervention

Shelves Before and After
Checklists for Every Day

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**Apathetic—Poor Executive Function**

**Apathetic—Fair Executive Function**

**Daily Schedule**

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**Taking the Bus**

**Disinhibition: Fair Executive Function**

**CAT Intervention for Work**

**Fair Executive Functioning**

**Where to Start**

- Problems with treatment adherence
- Safety issues and patient identified problems
- Medication adherence
- Orientation

**CAT Interventions for Complex Skills**

- Locating key rings
- All belongings have a clearly marked place where they are used/removed (pouch attached to the bed for glasses, laundry baskets placed where clothing is removed)
- Menu-driven electronic instructions for cooking
- Written instructions attached to cleaning supplies
Does CAT Work?

What is the evidence?

Study Design

240 approached
156 consented
99 inpatients 3 mos post DC
97 outpatients
105 Randomized
96 with baseline and 1 follow-up

TAU (n = 29)
CAT (n = 32)
PharmCAT (n = 34)

TAU = treatment as usual.


Sample Demographics

<table>
<thead>
<tr>
<th>% Male</th>
<th>% Hispanic</th>
<th>% Other/Mixed</th>
<th>Age</th>
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<tr>
<td>56.84</td>
<td>36.84</td>
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<table>
<thead>
<tr>
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<th>% African-American</th>
<th>Education</th>
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<tr>
<td>30</td>
<td>40</td>
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Medication Adherence over Time by Treatment

Adherence by unannounced, in-home pill counts; blood levels were not used because of problems in interpretation. Pharmacy records produce similar findings to those illustrated here.


Social and Occupational Functioning over Time by Treatment

Main effect of Group-F(2,147) = 113.38; P < .0001; visits by group (linear)-F(1,202) = 4.85; P < .005; visits by visits by group (quadratic) F(2,250) = 3.51; P < .032. CAT > Standard and PharmCAT at all time points except 6 mo follow-up. PharmCAT > Standard at 3 and 6 mos.


Time to Relapse by Treatment Group
Conclusions

- Environmental supports such as those used in CAT may improve adherence to oral antipsychotic medications in schizophrenia patients.
- Improvements in adherence remain 6 months after withdrawal of home visits.
- Improvements in functional outcome occur primarily in the Full-CAT program and decline 6 months after withdrawal of home visits.

Newer CAT Models in the Pay-for-Performance Era

- Superior Medicaid Familiar Faces Program
  - Payment to keep high utilizers out of hospital and ED
  - Payed each day person remains in community
  - Saves an average of $40,000 per patient in 9 months
- Money Follows the Person-DHHS
  - Individuals with medical and psychiatric illness
  - Desiring to move out of nursing homes
  - Followed with a package of services
    - Housing
    - CAT
    - Case Management
    - Supported Employment
  - Total cost savings (2005–2015) are $18,788,718

Practical Take-Aways

- Environmental supports can change behavior and create habits.
- They are easy to employ and are designed to be used by bachelor's level staff under the supervision of a psychologist.
- Improving functioning by directly working in the person's home and work environment yields large effects.