Early Intervention for Cognition and Functional Recovery

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Overview

1. Case: Mr P
2. Cognitive functioning in psychosis and relationship to outcomes
3. Cognitive rehabilitation in early psychosis
4. Case activity: Ms V
1. Case: Mr P

Mr P - Background

- 20 year-old man with mild intellectual disability referred to Orygen by mother following 3 week deterioration in mental state
- Living with supportive mother, parents divorced, had fortnightly visits with father, younger brother at Uni interstate
- Mild intellectual disability detected at 3 years old, no clear syndrome, pattern or chromosomal abnormality identified. Recent assessment Full Scale IQ = 57.
- Intensive early intervention programs, mainstream schooling to Year 8, Special School, Tertiary and Further Education (TAFE)
- Prior to illness, attending TAFE 4 days per week, travelling independently by public transport, working casually at his mother’s work, socially active, multiple sports
Mr P - Background

- Referred to Orygen Youth Health by mother in May 2010 following 3 week deterioration in mental state: paranoia, delusions, auditory hallucinations, withdrawal from usual activities & increasing distractibility.
- Symptoms worsened over next few weeks & included prolonged ‘absences’ or ‘frozen spells’ & catatonia.
- 4 month admission to IPU.
- Commenced on clozapine after adequate trials of aripiprazole & quetiapine were unsuccessful.
- Lost most of his independence skills when unwell & required assistance with all ADLs including eating, showering & toileting.
### Initial Assessment

<table>
<thead>
<tr>
<th>Domain</th>
<th>Result</th>
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</table>
| **Global Assessment of Functioning (GAF)**  | Premorbid = 90 (based on modified scoring system for ID; Hurley, 2001)  
Current = 38                                                                                                           |
| **Environmental & Functional Assessment (EFA)** | • No safety, medication adherence or orientation concerns. Had supplies for completing basic ADLs.  
• Some return to regular activities: watching & playing various sports, using his computer, music, visiting the zoo, & attending TAFE part-time  
• But, marked decline in adaptive functioning since FEP, which was causing significant stress for Mr P & his family & increased caregiver burden (including employment of attendant caregivers 2x week).  
• Main difficulty was Mr P’s notable attentional lapses, lack of initiation & ability to follow through with tasks he used to perform adeptly & independently (next slide). |
| **Overt Behaviour**                         | Increased Disinhibition, but mostly Apathy behaviour since FEP                                                                                                                                   |
| **Cognitive Function**                      | ID, *plus* decline in attention (frequent lapses), processing speed & executive function since FEP  
*Strengths:* rote learning, routine, literacy                                                                                           |
Specific Goals Identified

• To shower independently
• To cross the road safely & independently
• To get up & dressed independently
• To eat more slowly
• To catch the train safely & independently
• To initiate & maintain conversations
• To speak more slowly & clearly
• To stop picking fingernails
• To learn to cook some meals
Overview of Intervention (Cognitive Adaptation Training)

- Seen approximately weekly for 30 sessions over 9 months
- Sessions 30-60 minutes
- Sessions at home, local neighbourhood, catching train, cafes
- Mother frequently present & involved
- Focus on obvious & structured environmental cues/compensatory strategies aimed at prompting goal-directed behaviour
- Additional complementary techniques also used (e.g., role-play, reward chart)
21 STEPS TO HAVING YOUR BATH

1. Turn on tap and fill in shower
2. Wet your feet
3. Rub your feet with 2-WAYS OF SHAR
4. Apply soap with a sprayer
5. Turn off the tap
6. Wash your feet
7. Rinse your feet
8. Dry your feet
9. Ask your doctor for a sprayer
10. Brush your teeth
11. Wrap a towel around your feet
12. Wash your hands
13. Ask your doctor to spray your feet
14. Wash your feet
15. Rub your feet with 2-WAYS OF SHAR
16. Turn off the tap
17. Wash your feet with a sprayer
18. Rinse your feet
19. Turn off the tap
20. Ask your doctor for a sprayer
21. Wash your feet

PUT FORK/SPOON DOWN AFTER EACH BITE
Crossing the road safely

• Voice-recorded ‘tracks’ on iPod (e.g., “keep walking, don’t stop, keep going” repeatedly)
• 4-step routine:
  1. Get iPod ready
  2. Check for cars
  3. Say “safe” when deemed safe to cross
  4. Press play on iPod & cross road
• Lots of *in vivo* practice
• Practice during the week between sessions with mum
• After 4 months of training Mr P was going to the park independently & using steps 2-4 of routine (he no longer needed the iPod to prompt him across the road)
Conversation Skills

- Learn & role-play ‘conversation vigilance’ strategies (Twamley et al., 2008):
  - Remove distractions
  - Make eye contact
  - Paraphrase
  - Ask questions/get facts

- Coloured cue cards
Mr P – May 2012

• Discharged to Adult Mental Health Service for ongoing clozapine treatment & monitoring
• Commenced work 3 days per week in sheltered workplace & continues with TAFE 1 day per week
• Travels independently on PT & goes to park alone to play football
• Friends & family report that he continues to improve in spontaneity & ‘return to old self’
• Mother reported that he showers independently but shouts to her as he completes each of the steps on the cue card!

“it has helped Mr P regain his independence & confidence in himself”
2. Cognitive Functioning in Psychosis and Relationship to Outcomes
Cognition

• Thinking skills of the individual that are not directly observed but inferred from behaviour
• Can be likened to a computer: an individual’s capacity for input, storage, processing, & output of information
• Mental operations underlying goal-directed behaviour
Cognitive domains

- Overall intelligence/IQ
- Language abilities
- Visuospatial/nonverbal abilities
- Attention/concentration
- Working memory (the ability to hold & mentally manipulate information)
- Speed of information processing
- Verbal & visual learning & memory
- Executive functions (higher-level abilities such as planning, organisation, mental flexibility, reasoning, & problem solving)
- Social cognition (emotion recognition, theory of mind)
Cognitive deficits (and strengths)

Usually determined via one or both of two methods:

1. Performance is below (or above) what is expected based on the average performance of healthy individuals of a similar age, gender or educational background (often defined as performance 1-2 standard deviations below normative sample).

2. Performance is below (or above) what is expected based on the individual’s premorbid or present level of intellectual functioning. For example, the person is assessed as having average premorbid intelligence & was achieving good grades at school, but currently performs well below average on tests of attention & memory, indicating relative deficits in these domains.
Cognition in CHR, First-Episode & Chronic Schizophrenia

Clinical High Risk: Fusar-Poli et al. (2012), Wodberry et al. (2008)
First Episode Psychosis: Mesholam-Gately et al. (2009)
Cognitive deficits in psychosis

- Common, but heterogeneous
- Present *before or early in* illness onset
- Often present during symptom remission
- Not simply a result of poor motivation or lack of effort
- Not usually caused by medications (unless high doses or multiple medications are used)
- Can be worse in the context of substance use
National Survey of High Impact Psychosis (SHIP), 2010; N=1,825 - Top 3 Challenges facing people with psychosis in Australia (%)

- Difficulty getting medical appointment
- Inability to access mental health services...
- No family or caregiver
- Stigma/discrimination
- Other
- Unstable housing
- Poor physical health
- Uncontrolled mental health symptoms
- Financial matters

#1 for young people 44.5%
In Australia, nearly half people <35 years on Disability Support Pension due to mental illness.
Cluster membership associated with negative symptoms and functioning at baseline and 6-month follow-up

Good visual organisation & memory


22 y.o. female, Disability support worker

24 y.o. male, Cleaner & kitchen hand, electrical engineering course
Poor visual organisation & memory


22 y.o. male, P/T diploma theatre arts, looking for work

21 y.o. female, Unemployed
Verbal Memory predicts employment duration over 18 months

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<tr>
<th></th>
<th>LIST A</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td></td>
<td>CHURCH</td>
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<td>HOUSE</td>
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<td>RIVER</td>
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<td>FISH</td>
<td></td>
<td>RIVER</td>
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</table>

**SCORE**
4. Neuropsychological Rehabilitation in Youth Mental Illness
Cognitive Rehabilitation

- Pharmacological approaches: limited evidence
- Cognitive rehabilitation:
  - Cognitive remediation
  - Compensatory / environmental approaches
Cognitive Remediation

- **Aim**: to train & improve or restore cognitive processes.
- Via structured repetitive task practice: drill- or strategy-based computer, paper & pencil, or interpersonal exercises.
- Undertaken at high intensity & frequency (e.g., 40 mins 2-4 times/week).
- >40 years of research in schizophrenia & other mental illnesses, exponential growth in research over each decade.
- Most use computer-based exercises & most require a trained facilitator.
- Several approaches also add strategy coaching &/or include a group-based element.
Is Cognitive Remediation Effective?

Cognitive Compensation

• Apply & teach compensatory strategies & environmental supports to compensate for or ‘bypass’/‘work around’ cognitive difficulties, as well as capitalise on person’s cognitive strengths

• Primary focus of improving daily functioning, rather than cognition
  e.g., daily activity/task checklist; alarm or sign to prompt particular task

*Metaphor: Glasses for poor vision*
Benefits of Compensatory Approaches in Psychosis?

• Focus is on **functioning**
• Highly **flexible** - crucial for therapeutically engaging & treating young people, who often experience symptomatic exacerbations, amotivation, & a gradual adjustment to the disruption caused by the illness on normal development
• Relatively simple and easy to deliver
• Can involve **families**
• **Large effects** seen in chronic schizophrenia trials
• Cognitive Adaptation Training (CAT) model has largest evidence base
• But, also see [www.cogsmart.com](http://www.cogsmart.com) (Compensatory Cognitive Training, Elizabeth Twamley)
CAT Treatment Model

Velligan et al (2010)

- Manualised
- Individually-tailored
- Uses signs, calendars, checklists, & reorganization of belongings to cue, & sequence behaviours in person’s own environment
- Treatment is based upon how the person thinks & behaves (executive function & behaviour)
- Delivered weekly in the community for 9 months
## Behaviour Profiles

<table>
<thead>
<tr>
<th>Apathy</th>
<th>Disinhibition</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouble starting an activity</td>
<td>Easily distracted by things so trouble finishing an activity</td>
<td>Difficulty starting every step</td>
</tr>
<tr>
<td>Trouble starting each step in an activity</td>
<td>Skips steps because they are distracted</td>
<td>Distracted &amp; driven by cues in the environment</td>
</tr>
<tr>
<td>Need prompting &amp; fewer steps</td>
<td>Follows automatic cues in the environment &amp; does the incorrect thing</td>
<td>Need help starting tasks &amp; removal of distractions</td>
</tr>
<tr>
<td></td>
<td>Need you to remove the distractions &amp; keep them on track— &amp; cue helpful behaviour</td>
<td></td>
</tr>
</tbody>
</table>
Cognitive Adaptation Training Assessments

- **Cognitive Function**: Tests of executive function (also attention, memory, processing speed)
- **Overt Behaviour**: Frontal Systems Behaviour Scale (FrSBe) (Grace & Molloy, 2001)
- **Environmental & Functional Assessment (EFA)** (Velligan et al., 2010)
- **Specific goals** to be worked on
Results of assessment reveal one of the following CAT intervention categories:

<table>
<thead>
<tr>
<th></th>
<th>Apathy</th>
<th>Disinhibition</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Executive</td>
<td>Apathy/Poor</td>
<td>Disinhibition/Poor</td>
<td>Mixed/Poor</td>
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<tr>
<td>Function</td>
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<tr>
<td>Fair Executive</td>
<td>Apathy/Fair</td>
<td>Disinhibition/Fair</td>
<td>Mixed/Fair</td>
</tr>
<tr>
<td>Function</td>
<td></td>
<td></td>
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</tbody>
</table>

Each category guides the types of strategies used
## Meta Analysis

<table>
<thead>
<tr>
<th>Study Name</th>
<th>Outcome</th>
<th>Std diff in means</th>
<th>Standard error</th>
<th>Variance</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>Z-Value</th>
<th>p-Value</th>
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<td>Hansen, 2012</td>
<td>GAF</td>
<td>0.430</td>
<td>0.283</td>
<td>0.080</td>
<td>-0.125</td>
<td>0.965</td>
<td>1.517</td>
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<td>Quee, 2010</td>
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<td>0.536</td>
<td>0.372</td>
<td>0.139</td>
<td>-0.194</td>
<td>1.265</td>
<td>1.440</td>
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<td>Velligan, 1996</td>
<td>FNA</td>
<td>0.874</td>
<td>0.331</td>
<td>0.110</td>
<td>0.235</td>
<td>1.525</td>
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<td>0.884</td>
<td>2.559</td>
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Allott et al. (in preparation)

7 RCTs (N=391 patients): compared to various control conditions, CAT significantly improves global functioning in schizophrenia, with a large effect observed (SMD=0.78; 95%CI=0.46-1.11; \( p < 0.001 \))
Feasibility Study of CAT in FEP

Allott et al. (2016) *Early Intervention in Psychiatry*; Allott et al. (2017) *Work*

AIM: to examine the feasibility & acceptability of CAT in FEP

- **Inclusion**: FEP, age 15-25, cognitive or functional difficulties
- **Exclusion**: ID, neurological condition, florid psychosis, poor English, environmental/clinical risk (due to home visits)
- Assessments of feasibility & acceptability, participant goals & functional needs, clinical observations, & formal measures of functioning, quality of life & motivation at baseline & 9-months
- CAT delivered as per manual - adaptations made as required & recorded for later revision for FEP
- CAT supervision via Skype & email
Recruitment & Retention

• 8 referrals in 3 months (included Christmas period) – 5 consented, 1 ineligible, 2 refused
• No exclusions/withdrawals based on risk
• No hospital admissions
• 100% completed CAT intervention; session attendance rates very high (95.3%)
<table>
<thead>
<tr>
<th>Demographics</th>
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<td>92</td>
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<td>27</td>
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<tr>
<td>Average session preparation time (min)</td>
<td>11</td>
<td>14</td>
<td>39</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>Cost of materials</td>
<td>$62.77</td>
<td>$133.15</td>
<td>$14.50</td>
<td>$73.39</td>
<td>$91.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$75.02 ($43.18)</td>
</tr>
</tbody>
</table>
Satisfaction with CAT dose

- 4/5 participants indicated weekly sessions were ‘just right’; one participant stated it was ‘too frequent’
- 4/5 participants indicated 9 months was ‘just right’; one participant stated the duration was ‘too short’
- All case managers indicated the length & frequency of CAT sessions was ‘just right’
## Functional domains targeted using CAT with FEP participants (N=5)

<table>
<thead>
<tr>
<th>Functional Domain</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education/school*</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>Organization &amp; planning</td>
<td>1, 2, 4, 5</td>
</tr>
<tr>
<td>Work*</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>Transportation*</td>
<td>1, 4, 5</td>
</tr>
<tr>
<td>Hygiene/personal care</td>
<td>1, 2</td>
</tr>
<tr>
<td>Leisure/social skills</td>
<td>1, 5</td>
</tr>
<tr>
<td>Household chores</td>
<td>1, 5</td>
</tr>
<tr>
<td>Orientation</td>
<td>4, 5</td>
</tr>
<tr>
<td>Budgeting/financial management</td>
<td>2</td>
</tr>
<tr>
<td>Cooking skills</td>
<td>3</td>
</tr>
</tbody>
</table>

* All 5 participants had or were receiving supported employment (IPS)

* 4/5 participants had Learner’s permit
Key Themes

- Cognitive heterogeneity, but clear functional decline
- Functional domains different to chronic samples – related to age, stage of illness & family factors
- Family involvement (4/5) – measure caregiver burden
- Not all generic strategies applicable – critical supplies, medication management, behaviour checklists
- External & internal compensatory strategies useful
Key Themes

• Use of technology
• *In vivo* exposure, skills practice & behavioural activation important components
• Psychoeducation to family, treating team & external agencies re cognition, behaviour & psychosis
• Stigma – formal measure in future
• Adaptation to psychosis
Participant Satisfaction with CAT

“How useful was...?”

- Ax of Cog
- Ax of Goals
- Feedback
- 1 on 1
- Home based
- Family
- Env Supports
- Strategies
- Benefited
- Satisfied

- Very much
- Somewhat
- Neutral
- Not really
- Not at all
Case Manager Satisfaction with CAT
“How beneficial was...?”

- Very much
- Somewhat
- Neutral
- Not really
- Not at all

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

1 on 1 | Home based | Communication | Benefited | Satisfied | Positive impact | Negative impact
--- | --- | --- | --- | --- | --- | ---
Red | Red | Red | Blue | Red | Red | Green
What goals, habits, or areas of your life has CAT helped with?
What things did you like or find most helpful about CAT?

“Time management”
“Thinking positively about my recovery”
“Made me see my goals more clearly”
“Having a companion to assist with cooking and create a recipe book”
“Therapist coming to my home”
“Helping with public transport (e.g., getting to city)”
“Teaching me to use a calendar to remember the date and record appointments”
“I learnt heaps of new things!”
Formal outcome measures

- SOFAS: $d = 1.69$
- UPSA - P&O: $d = 0.94$
- QoL - Psychological: $d = 2.36$
Tips when using compensatory strategies

• Involve caregivers/family
• Decide on goals collaboratively & periodically review them
• Ensure client can see the relationship between the strategy being implemented & their stated goal(s)
• Communicate with other treating staff (e.g., ward or accommodation staff)
• Early on, focus on most achievable goals so as to raise motivation & hope for more challenging goals
• Use strategies that you believe the client will most likely engage in (ask them)
• Environmental supports do not need to be permanent; they may be a stepping-stone to enhancing more automated adaptive behaviours
• Remember: If you don’t try you won’t know – sometimes you need to use trial-and-error!
4. Case activity: Ms V
Background to Ms V

• 24 year old university student who experienced a significant decline in functioning over 12 month period prior to experiencing FEP (diagnosis of schizophrenia).
• Lives with parents & younger brother.
• After several trials of different atypical antipsychotics, her psychotic symptoms resolved on aripiprazole, however she continues to experience difficulties with daily functioning, including attending to her self-care & keeping up with the demands of university.
• Her premorbid intellectual functioning was above average (estimated IQ of 110), but since experiencing psychosis she presents with significant cognitive difficulties including slowed processing speed, poor concentration, poor memory & problems with organisation.
Background to Ms V

- Ms V decided to drop out of university & look for a job.
- With the help of an employment specialist she found part-time employment at a fast-food restaurant (Subway) & also as a receptionist at a medical centre.
- However, ongoing cognitive difficulties are making it challenging for Ms V to maintain her employment & she is at risk of losing her jobs (employers have given warnings).
- What strategies could you put in place to help support Ms V in order to maintain her employment?
## Possible Compensatory Interventions for Ms V

<table>
<thead>
<tr>
<th>Cognitive &amp; work difficulties identified</th>
<th>Strategies you could use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concerns about being too slow</td>
<td></td>
</tr>
<tr>
<td>2. Problems with punctuality/being late</td>
<td></td>
</tr>
<tr>
<td>3. Lack of attention to grooming &amp; hygiene (e.g., pants too low, revealing buttocks; unkempt hair)</td>
<td></td>
</tr>
<tr>
<td>4. Trouble remembering tasks to be completed</td>
<td></td>
</tr>
<tr>
<td>5. Learning colleagues’ names &amp; phone greeting</td>
<td></td>
</tr>
</tbody>
</table>
Kelly Allott
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