Cognitive Remediation Work in Anorexia Nervosa

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Map of the talk and workshop

- Research background and rational for CRT
- Why CRT for ED
- What is current evidence for CRT

In the workshop I will demonstrate HOW
Practical elements for assessments / exercises
Plans for the future research/clinical bridge
WHY CRT for ED

• Poor treatment engagement – drop out in AN clinical studies
• Findings in Cognitive characteristics for ED
• Successful use of CRT in other areas of MH
www.NICE.org

has concluded no grade A (reflecting strong empirical data)
recommendation for treatment for AN and
49 C (expert opinion in absence of strong data). Further research in effective treatments was encouraged.

9 RCT-s for AN; drop out rates very high (between 30-65%)

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Many patients say in different words:

I think it is going to be difficult to think my way out of my problem because I think the problem is the way that I think
Cognitive style variation in the general population

- CC: e.g. good proof reading (Lang et al 2014, 2015)
- SS: e.g. choosing one strategy routine (Tchanturia et al 2011, 2012)
  Estimated IQ in anorexia: A systematic review
  Annals of General Psychiatry. 23; 9 (1) :40
Research in cognitive characteristics

- Cognitive inflexibility in Anorexia Nervosa robustly replicated
  (review Westwood et al 2016, Tchanturia et al 2012)
- Poor gestalt processing
  (review Lang et al 2016, 2014)
- Perfectionism is strongly present in AN
  (review Lloyd et al 2014)
- IQ is higher than average
  (Lopez et al 2010)
Excessive attention to detail

- Normal tendency to examine context of information, link together items of information to understand the “broad picture” (U. Frith 1991)
- Individuals with autistic spectrum disorders have weak central coherence and are not able to see “wood for trees” (F. Happé 1996)
Attention to detail: Embedded Figures Test
Embedded Figures Test

Lopez, C., et al (2008); *IJED, 41*(2), 143-152, **Lang et al 2016 Plos one.**

*N = 42 (AN) and 42 (HC) – pilot*

\[ p < 0.01 \]

\[ p < 0.001 \]
CC studies in adults

ROCFT (N=252)


Studies not included in meta-analysis:

• Lindner et al., 2012 – did not report CCI
• Goddard et al., 2013 – Only included males, but found that ED males had weaker central coherence than HC males (d=-0.5, p=0.009).
• Kanakam et al., 2012- Included mixed AN & ANREC: reported no differences between ED twins and HC (d=0.1, p=0.05).
Effect size is similar in CC in children

Lang et al 2015, 2016 Plos one

N= (AN -42; HC =42) in children
Trail Making Task (TMT)

Wisconsin Card Sort Task (WCST)

Set-shifting measures

Brixton Task
The task (Part B) requires *rapid and sustained alternation between two sets*. This alternation is thought to require executive control, specifically flexibility.
Set Shifting WCST

• Measures abstract reasoning and ability to shift strategies efficiently.

No significant difference in perseverative errors between AN and ASD participant groups, suggesting similar set-shifting profiles.

Westwood et al. (2016) Psychological Medicine
Weight gain alone does not change the flexibility of thinking.

Research and clinic - NEUROPSYCHOLOGY

RESEARCH
Sensitive experimental paradigms

What happens
Before and after psychological treatment?

MEASURE THE OUTCOMES

INFORM THE TREATMENT
- Information for the treatment
- What do we treat?
Cognitive Remediation Therapy

CRT

Is a psychological intervention that:

- Consists of mental exercises aimed at improving cognitive strategies.
- Encourages thinking about thinking (Reflection).
- Helps to explore new thinking strategies in everyday life.

Target for CBT reduction in symptoms, CRT thinking skills themselves.
Is there evidence that executive *impairments* can be effectively treated?

What patients think

How patients think
Cognitive remediation: a promising tool for the treatment of schizophrenia
(Demily, C & Frank, N. 2008)

- Integrated Psychological Treatment (IPT) - Brenner & Volker (1992, 2005)
- Cognitive Remediation Therapy (CRT) – Delahunty & Morice 1993; Wykes, Reeder (2000, 2007)
- Neurocognitive Enhancement Therapy (NET) – Bell et al (2007)
- Cognitive Adaptation Training (CAT) – Velligan et al 2008)
Meta-Analyses of RCTs of Cognitive Training/Remediation

2003: 17 studies
- Cognition = 0.32
- Symptoms = 0.26
- Functioning = 0.51

2007: 26 studies
- Cognition = 0.41
- Symptoms = 0.28
- Functioning = 0.36

2011: 40 studies
- Cognition = 0.45
- Symptoms = 0.18
- Functioning = 0.42

A Review of Cognitive Training in Schizophrenia
by Elizabeth W. Twamley, Dilip V. Jeste, and Alan S. Bellack

Abstract
Empirically supported treatments for schizophrenia now include a variety of psychosocial interventions, such as social skills training, vocational rehabilitation, and psychotherapy. As awareness of the functional importance of neurocognitive impairments in schizophrenia has increased, interest in treatments to improve cognition has grown. We review the literature on cognitive training (CT), which has been studied in 17 published randomized, controlled trials to date. The differential effectiveness of uncomputerized and computer-assisted interventions, with and without strategy coaching, and an environment-adaptive intervention, is examined. We conclude that the different types of approaches, whether computer-assisted or not, all have effective components that hold promise for improving cognitive performance, symptoms, and everyday functioning. Our recommendations for further research, including the use of functional outcomes measures and long-term followup, highlight the importance of improving ecological validity in this area of treatment research.

Keywords: Psychosis, schizophrenia, psychosocial treatment, neuropsychology, rehabilitation.


A Meta-Analytic Review of Cognitive Remediation in Schizophrenia

Susan R. McGurk, Ph.D.
Elizabeth W. Twamley, Ph.D.
David I. Sitzer, Ph.D.
Gregory J. McHugo, Ph.D.
Kim T. Mueser, Ph.D.

Objective: This study evaluated the effects of cognitive remediation for improving cognitive performance, symptoms, and psychosocial functioning in schizophrenia.

Method: A meta-analysis was conducted of 26 randomized, controlled trials of cognitive remediation in schizophrenia including 1,151 participants.

Results: Cognition was significant across all three effect sizes for (0.41), a small effect size for symptoms (0.29). The effects of cognitive remediation on psychosocial functioning were significantly stronger in studies that provided adjunctive psychosocial rehabilitation than in those that did not.

Conclusions: Cognitive remediation programs provide benefits for schizophrenia, and when combined with psychiatric rehabilitation, this benefit generalizes to functioning, relative to rehabilitation alone. These benefits cannot be attributed to poor study methods.

Reviews and Overviews

A Meta-Analytic Review of Cognitive Remediation for Schizophrenia: Methodology and Effect Sizes

Till Wykes, Ph.D.
Vv V. Huddy, Ph.D.
Caroline Cellard, Ph.D.
Susan R. McGurk, Ph.D.
Pål Grøber, Ph.D.

Objective: Cognitive remediation therapies for schizophrenia were developed to treat cognitive problems that affect functioning, but the treatment effects may depend on the type of trial methodology adopted. The present meta-analysis will determine the effects of treatment and whether study method or potential moderators influence the estimates.

Method: Electronic databases were searched up to June 2009 using variants of the key words "cognitive," "training," "remediation," "clinical trial," and "schizophrenia." Key research were 1750 studies in which 1750 of participants had a diagnosis of schizophrenia, all of whom received standard care. There was a companion group and allocation procedure in these studies. Data were available to calculate effect sizes on cognition and/or functioning. Data were independently extracted to two reviewers with excellent reliability. Methodological moderators were extracted through the Clinical Trials. Assessment Measures and verified by authors in 90% of cases.

Results: The meta-analysis (2.114 percent) yielded significant effects on global changes and functioning. The cognitive effect was small and disappeared at follow-up assessment. No treatment element (remediation approach, duration, computer use, etc.) was associated with cognitive outcome. Cognitive remediation was more effective when patients were clinically stable. Significant stronger effects on functioning was found when cognitive remediation therapy was assessed together with other psychosocial rehabilitation, and a much larger effect was present when a strategic approach was adopted together with adjunctive rehabilitation. Despite availability in methodological rigor, this did not moderate any of the above effects, and even in the most rigorous studies there were similar small to moderate effects.

Conclusions: Cognitive remediation benefits people with schizophrenia, and when combined with psychiatric rehabilitation, this benefit generalizes to functioning, relative to rehabilitation alone. These benefits cannot be attributed to poor study methods.

(Ann. Psychiatry Wykes et al., vol. 58; 2011)}
What therapists think they are changing with CRT

- **Brain connectivity** - fMRI
- **Cognition** – Flexibility, memory, planning, information processing (e.g. Wykes et al 2007)
- **Metacognition** – thinking about the thinking
- **Quality of Life** (e.g. McGurk et al 2007)
- General functioning
- Symptoms
Targeting cognitive styles and strategies in ED

Cognitive Remediation Therapy for Anorexia
Manual for Clinicians
Tchanturia, Davies, Reeder, Wykes
2007, 2010
London 2 version
available from the SLAM ED website
Cognitive Remediation Therapy: ‘The how rather what of thinking’

• Manual based 10-session intervention, twice a week, for adult AN admitted to a specialist ED Unit

• Include exercises to:

(1) increase cognitive flexibility

(2) see the ‘bigger picture’

(3) relate to real life
Research evidence for CRT in ED

MRC Framework for the Development of Complex Interventions

Pre-clinical
- Explore relevant theory to ensure best choice of intervention and hypothesis and to predict major confounders and strategic design issues

Phase I
- Identify the components of the intervention, and the underlying mechanisms by which they will influence outcomes to provide evidence that you can predict how they relate to and interact with each other

Phase II
- Describe the constant and variable components of a replicable intervention AND a feasible protocol for comparing the intervention to an appropriate alternative

Phase III
- Compare a fully-defined intervention to an appropriate alternative using a protocol that is theoretically-defensible, reproducible and adequately controlled, in a study with appropriate statistical power

Phase IV
- Determine whether others can reliably replicate your intervention and results in uncontrolled settings over the long term

Cognitive Remediation Therapy (CRT) for eating and weight disorders

Continuum of increasing evidence

Routledge 2015 London
www.katetchanturia.com
Framework for Development / Evaluation of RCTs for Complex Health Interventions

**Theory**
- * Empirical evidence from ED
- * Intervention tailored from psychosis

**Modelling**
- Case Series
  - 23 patients
- Qualitative feedback
  - Patients / professionals
- Replication
- 7 papers

**Exploratory Trial**
- CRT Testing in group settings

**Definitive RCT**
- RCT-s published from
  - USA
  - Germany
  - Netherlands
  - France in progress

**Pre-clinical**

**Phase I**

**Phase II**

**Phase III**

**Phase IV**

Long-term Implementation
First RCT – Stanford USA:


Stanford trial (N=46)

Does CRT help to keep patients in the treatment?
RCT from Heidelberg Germany


Heidelberg trial (N=40)

Baseline

1

TAU = CRT

TAU = Non-Specific CT

Does CRT improve flexibility of thinking better than NSCT?
Does CRT help to improve quality of life and eating pathology?

RCT from The Netherlands

RCT – on going France: TRECOGAM

Paris trial (N=120: 60 AN-R + 60 AN-BP)

Does CRT improve neuropsychological functioning?

Does CRT improve clinical outcome?
CRT improves cognitive task performance
(Tchanturia et al 2014 for review EERD)

Effect sizes of the CRT treatment studies including cognitive assessments
Drop out from the treatment (psychological and psychopharmacological 35-65% reported in the past studies before 2004)

From available evidence drop out from CRT is low! (0-15%)
Quality of life more than symptoms improve in Schizophrenia what about AN?
Evidence for QoL improvement from one case series and one RCT trial!
What patients think about CRT

• Qualitative studies in adults (Whitney et al 2008)
• Recently larger qualitative study in young people (12-18):

Giombini et al in press:
‘Looking at the big picture is also relevant to real life, especially in stressful situations where it is important to prioritise, such GCSE’.
‘I discovered that I do not like changes, but over the course of my CRT meetings I attempted to change small things. Most of them felt weird, but some changes were good ...’
Suggested improvements by patients

• ‘I think that CRT could be improved by having more and longer sessions because they are so much fun. I also think it would be interesting to do some group CRT as well as individual’.

• the use of homework books so it could be discussed and perhaps be more useful...
European Eating Disorders Review

Cognitive Remediation Therapy as an Intervention for Acute Anorexia Nervosa: A Case Report

Helen Davies and Kate Tchanturia*
Institute of Psychiatry, King’s College, University of London, UK

The aim of this case report is to illustrate how cognitive remediation therapy (CRT) can be used as part of the treatment programme in acute anorexia nervosa (AN) to stimulate mental activities and improve thinking skills and information-processing systems when other therapies, for example cognitive behavioural therapy (CBT), may be too complex and intense for the patient to engage in. Furthermore, we hypothesize that CRT may be an effective tool in improving flexibility of thinking in AN, as previous neuropsychological findings have proved that rigidity is one of the maintaining factors in AN. Copyright © 2005 John Wiley & Sons, Ltd and Eating Disorders Association.
What we think works for AN patients well from CRT active ingredients:
- Shifting from symptoms to thinking styles,
- later to the idea of bigger picture of recovery,
- motivation style,
- playful nature, opportunity to reflect
Future directions
Clinical and research developments
Cognitive remediation, brain function and central coherence: an anorexia nervosa pilot study

Leon Fonville¹⁺, Vincent Giampietro²⁺, Helen Davies¹, Naima Lounes¹, Andrew Simmons²,³, Steven Williams²,³ and Kate Tchanturia¹,⁴*

Abstract

Objectives: Cognitive remediation therapy (CRT) for anorexia nervosa (AN) is an intervention designed to improve the thinking processes of AN patients as well as their general cognitive functioning. While previous behavioural studies have shown promising results, no studies to date have assessed the neuronal effects of CRT in AN.

Methods: In this study, nine patients and fourteen healthy controls (HC) performed a variant of the embedded figures test (EFT) during functional magnetic resonance imaging at two separate occasions to assess central coherence. Patients received 10 sessions of CRT in between scans, and controls did not receive any training.

Results: While both groups showed improvement on the task over time, there was no indication of greater improvement in performance after CRT. Neuroimaging data did reveal that on complex embedded figures (CEF), those with AN showed a stronger decrease in task-related activation during the follow-up scan in the fusiform gyrus and middle occipital gyrus as well as greater task-related deactivation in the medial frontal gyrus extending into the precuneus.

Thanks to the home and international

For manuals and more information visit:
www.katetchanturia.com

Research gate
If we have time for questions?
If not email me:
Kate.Tchanturia@kcl.ac.uk
Thanks

BRC- NIHR Biomedical Research Centre for Mental Health and the National Institute of Health Research (NIHR)

Swiss Anorexia Nervosa Foundation

The Psychiatry Research Trust

Ariadne

South London and Maudsley NHS Foundation Trust
References

Systematic reviews:


Group CRT:


Patients feedback:


Child adolescent adaptation:


Careers and family:

References (fMRI studies)


