# DEFICIT DELLE FUNZIONI ESECUTIVE E… CAT

*Dario Lamonaca CSM Aulss 9 Scaligera, Legnago VR*

Guida poco che devi bere
welcome in Veneto
Tedeschi anca qua
El me scusa... par nàr a Madonna de Campiglio?
Bresciani
El monte con la facia de Napoleon
Kite surf
Toi...
Trentini
Trekking e bom
Formaio
Gnochi de malga
Lessinia
Cimbri
Cimbri e veronesi
Sirese
Mezi trentini
Vache
Valdadigensi
Grandine
Marmi
Vino
Valpolicella
Rally
Marmi anca qua
Valpantena
Píoe sempre
Grappa
Veronesi 100%
Persegari
Pearà
Verona DB
Hellas e butei
Centri commerciali
Locali fighi
Casin e fiera
Traffico
Mama africa
Pomi
E ancora pomi
Le basse
Tabacco
Tastasàl
Risotto
Ancor più basse
Fossi e sdinsale
Il nulla... oltre ai campi
Campi
Mezi rovigoti
Rovigo
Co Rovigo non me intrigo
Campi e fossi
Quasi bresciani
Discoteche
Tortellini
Distaccamento di Mantova
Mantovani
Sommacalabria
Aerei dapartuto
Do sonti finio?
Zanzare co la tarda
Risotto con le anguille
Metà mantovani e metà veronesi
A che sem en lombardia non en romagna...
Ma ela vera che le romagnole le fa ben i...
*RICALCOLO DEL PERCORSO*... diaolocan... Tom Tom de merd#
Veri mantovani
Padova?
Miao
Magnagatti
Vicentini... ormai...
Mesi vicentini
Vino
Mezi trentini
Laghensi e tedeschi
Vin bon
Tedeschi
Gnocca
Turisti che serca Gardaland
Altri tedeschi a Gardaland
Autovelox
Pochi veronesi
Vino
Vacche
Grappa
Vino
Vicentini... ormai...
Semo ancora a Verona?
Go sbajà strada me sa...
Quasi veronesi
Mezzane di sotto
Lavagno
Cologna
Caldiero
Belfiore
Zevio
Oppeano
Isola della Scala
Isola Rizza
Roverchiara
Bonavigo
Minerbe
Angiari
Concamarise
Nogara
Sanguinetto
Casaleone
Gazzo Veronese
Terrazzo
Castagnaro
Veronella
Zimella
Albaredo d'Adige
Roveredo di Guà
Sorgà
Erbè
Trevenzuolo
Salizzole
Bovolone
San Pietro di Morubio
Boschi Sant'Anna
Bevilacqua
Pressa
Villa
Sommacampagna
Castel d'Azzano
Villafranca
Povegliano
Vigasio
Mozzecane
Nogarole Rocca
Valeggio
Castelnuovo del Garda
Sona
Bussolengo
Pescantina
Pastrengo
Cavalon
Bardolino
Garda
Caprino
Brenzone
Ferrara di M. B.
Brentino
Erbezzo
Cerro Veronese
Velo
Rovere
Vestanova
Tregnago
Giovanni Ilarione
Mezzane di sotto
Iliasi
Lavagno
Cologna
Caldiero
San Bonifacio
Arcole
Zevio
Oppeano
Isola della Scala
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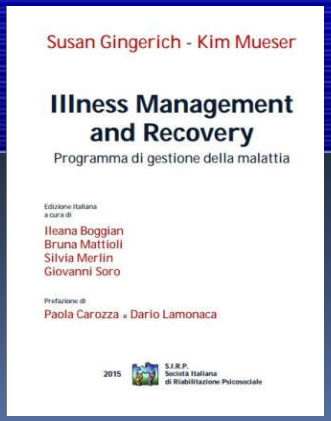
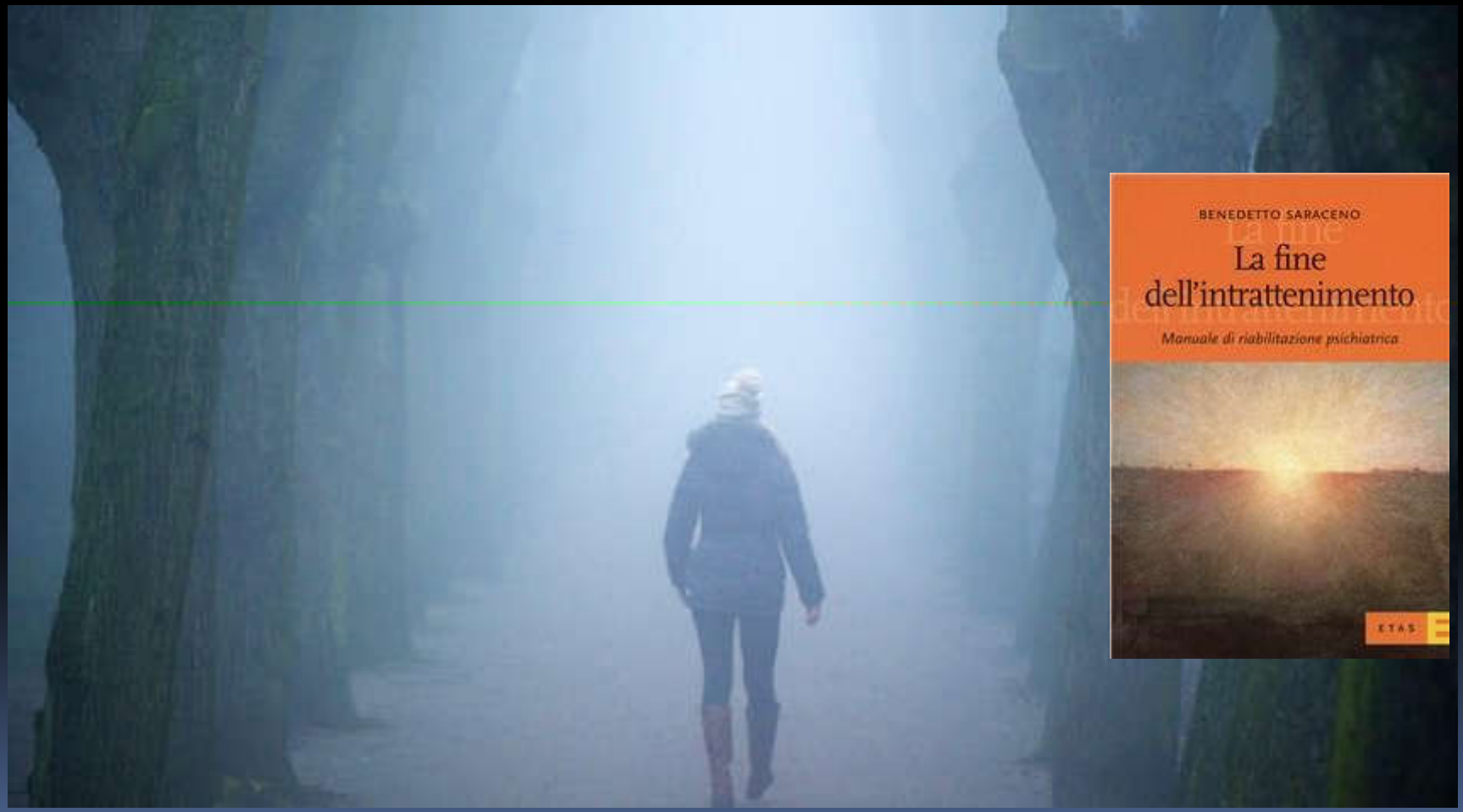
Minerbe
Bevilacqua
Pressa
Roveredo di Guà
Roverchiara
Zimella
Veronella
Albaredo d'Adige
Castagnaro
Rovigo

# Dimensions Altered in Individuals with Schizophrenia

- Ability to work
- Interpersonal relationships
- Self-care abilities
- Social functioning
- Quality of life



# *La riabilitazione deve uscire dalla nebbia…*



# SURVEY DELLE ATTIVITA' RIABILITATIVE IN ITALIA: UNA INDAGINE DELLA S.I.R.P. (Società Italiana di Riabilitazione Psicosociale)

## Frequenza categorie attività riabilitative

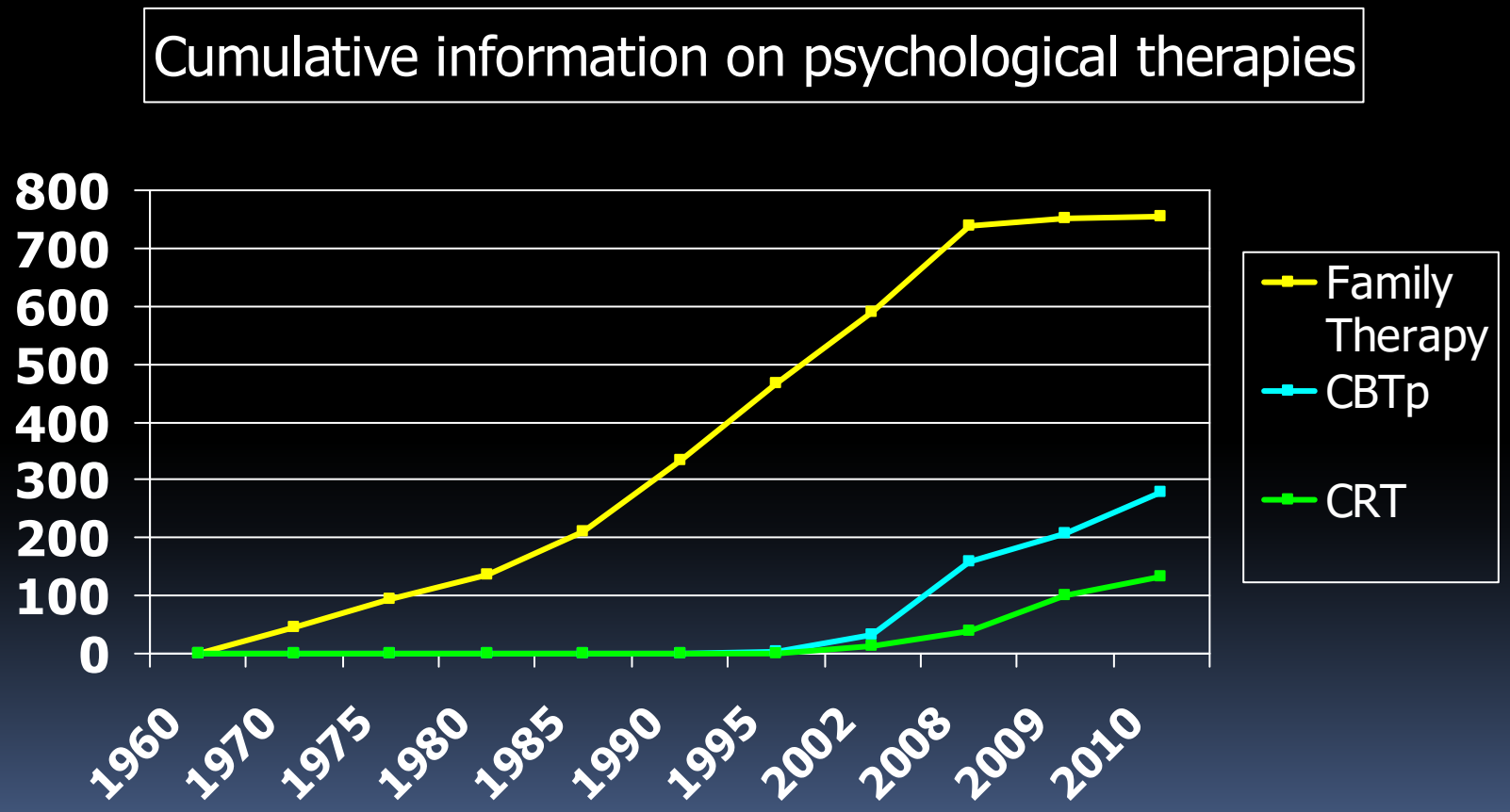
| | | |
|---|---|---|
| Attività per il recupero funzionamento quotidiano e sociale | % | 33,2 |
| Attività occupazionali «ricreative-risocializzanti» | | 17 |
| Attività tempo libero e sport | | 11 |
| Tecniche espressive (artiterapie) | | 6,5 |
| Inserimenti lavorativi / formazione-lavoro | | 6,5 |
| Psicoeducazione (pazienti) | | 5,2 |
| Social Skills Training | | 5,2 |
| Gruppi rivolti all'espressività verbale | | 4,9 |
| Attività psicoeducative rivolte ai familiari | | 2,1 |
| Attività riabilitazione cognitiva | | 1,6 |
| Varie | | 2,1 |
| Missing | | 0,8 |

2901 schede

# *Limitations of biological treatments*

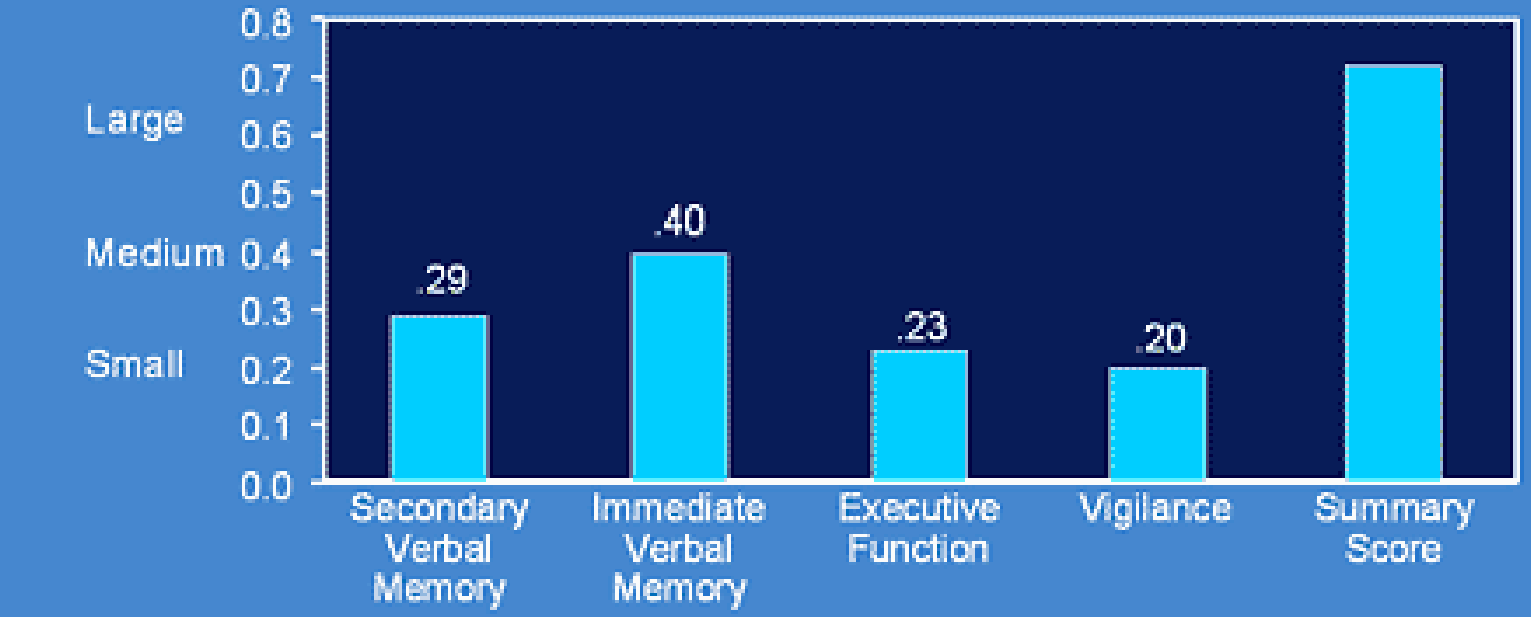
- 10-30% fail to remit by 12 months (Emsley et al. 2007))
- Up to 40% may only partially recover
- The problem of relapse
- Adherence rates (Lieberman et al., 2005; Meltzer 2006)
- Side-effects
- Secondary morbidity and co-morbidity
- Unemployment and functioning (Killackey et al.,2008)

# Rate of accumulation of information on therapies



# Cognitive Deficits and Functional Outcome

## *Effect Sizes (Cohen's r)*

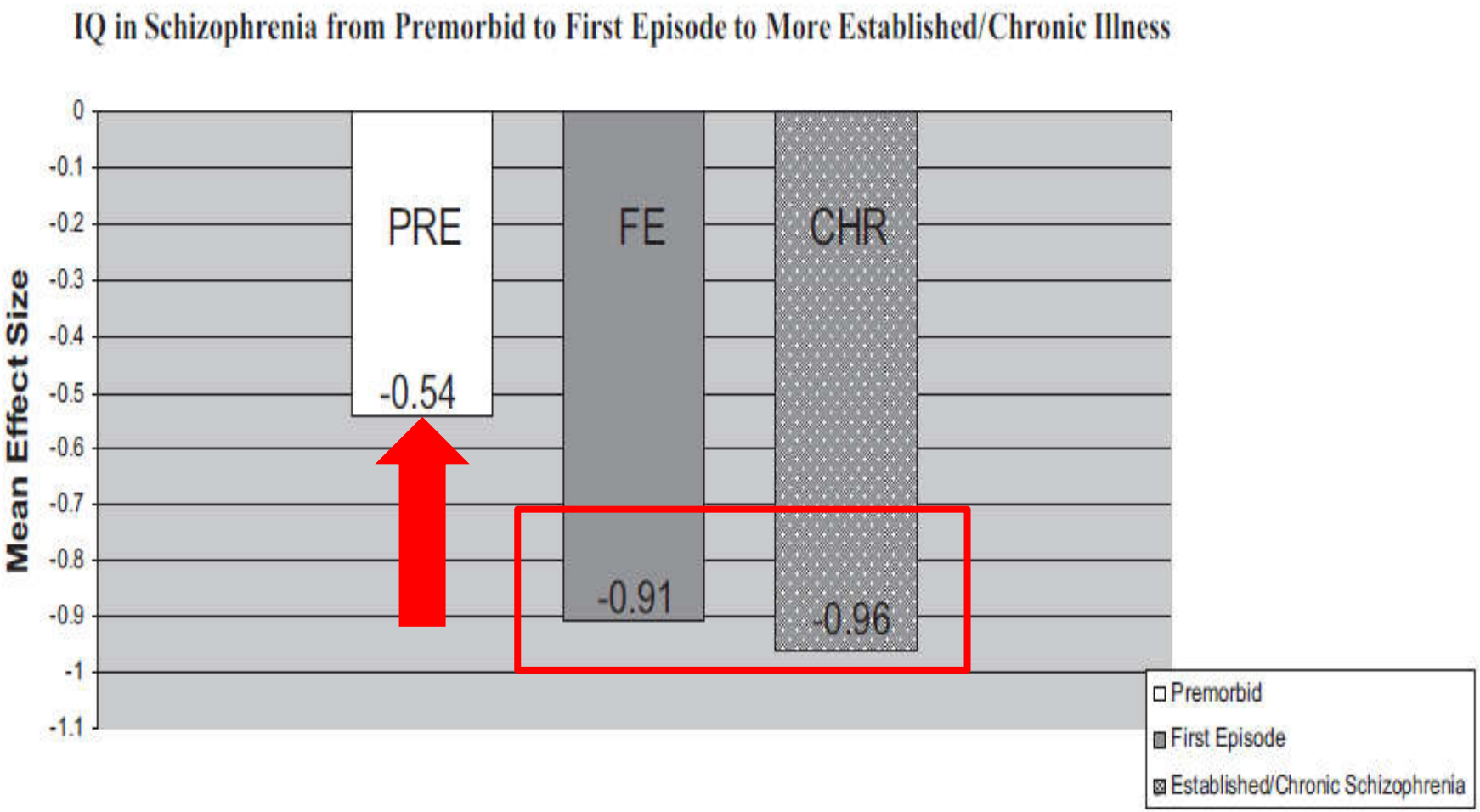



*Estimates weighted by sample size.
Results from 4 separate metaanalyses.
Green MF et al. *Schizophr Bull.* 2000;26:119-136.

# Mean Neurocognitive Effect Sizes Ordered By Magnitude and Corrected for Sample Size

| Test or construct | | *SD* | *n* | *% pts below md* |
|---|---|---|---|---|
| Global Verbal Memory | 1.41 | 0.59 | 31 | 78 |
| Bilateral Motor Skill | 1.30 | 0.38 | 5 | 77 |
| Performance IQ | 1.26 | 1.00 | 17 | 77 |
| Continuous Performance | 1.16 | 0.49 | 14 | 75 |
| Word Fluency | 1.15 | 1.00 | 29 | 75 |
| Stroop Test | 1.11 | 0.49 | 6 | 74 |
| WAIS-R IQ | 1.10 | 0.72 | 35 | 74 |
| Token | 0.98 | 0.49 | 7 | 71 |
| Tactile-Transfer | 0.98 | 1.71 | 12 | 71 |
| Selective Verbal Memory | 0.90 | 0.62 | 7 | 70 |
| Wisconsin Card Sort | 0.88 | 0.41 | 43 | 69 |
| Verbal IQ | 0.88 | 0.66 | 27 | 69 |
| Unilateral Motor Skill | 0.86 | 0.39 | 6 | 69 |
| Trail Making-Part B | 0.80 | 0.50 | 15 | 68 |
| Nonverbal Memory | 0.74 | 1.98 | 14 | 67 |
| Trail Making-Part A | 0.70 | 0.36 | 12 | 66 |
| Facial Recognition | 0.61 | 0.36 | 8 | 64 |
| Digit Span | 0.61 | 0.43 | 18 | 64 |
| Line Orientation | 0.60 | 0.63 | 4 | 64 |
| Non-WAIS-R IQ | 0.59 | 0.51 | 43 | 64 |
| Vocabulary | 0.53 | 0.21 | 38 | 62 |
| Block Design | 0.46 | 0.39 | 12 | 61 |

# Neurocognition in First-Episode Schizophrenia: A Meta-Analytic Review

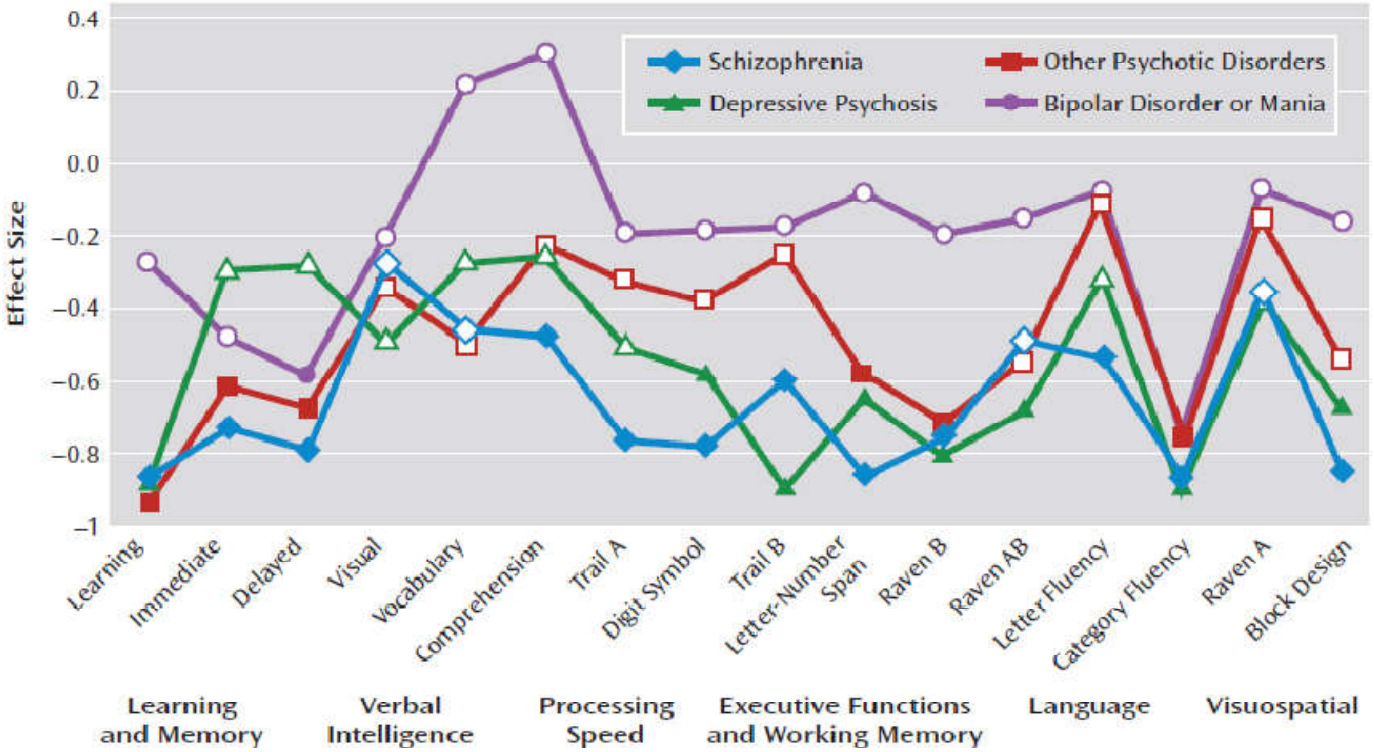



**Comparison to ES values for premorbid schizophrenia are based on the data of a meta-analytic review from Woodberry, Giuliano and Seidman, 2008)**

Neuropsychology
2009, Vol. 23, No. 3, 315–336

# Specific and Generalized Neuropsychological Deficits: A Comparison of Patients With Various First-Episode Psychosis Presentations

FIGURE 2. Neuropsychological Performance Among Patients With Various First-Episode Psychosis Presentations[a]

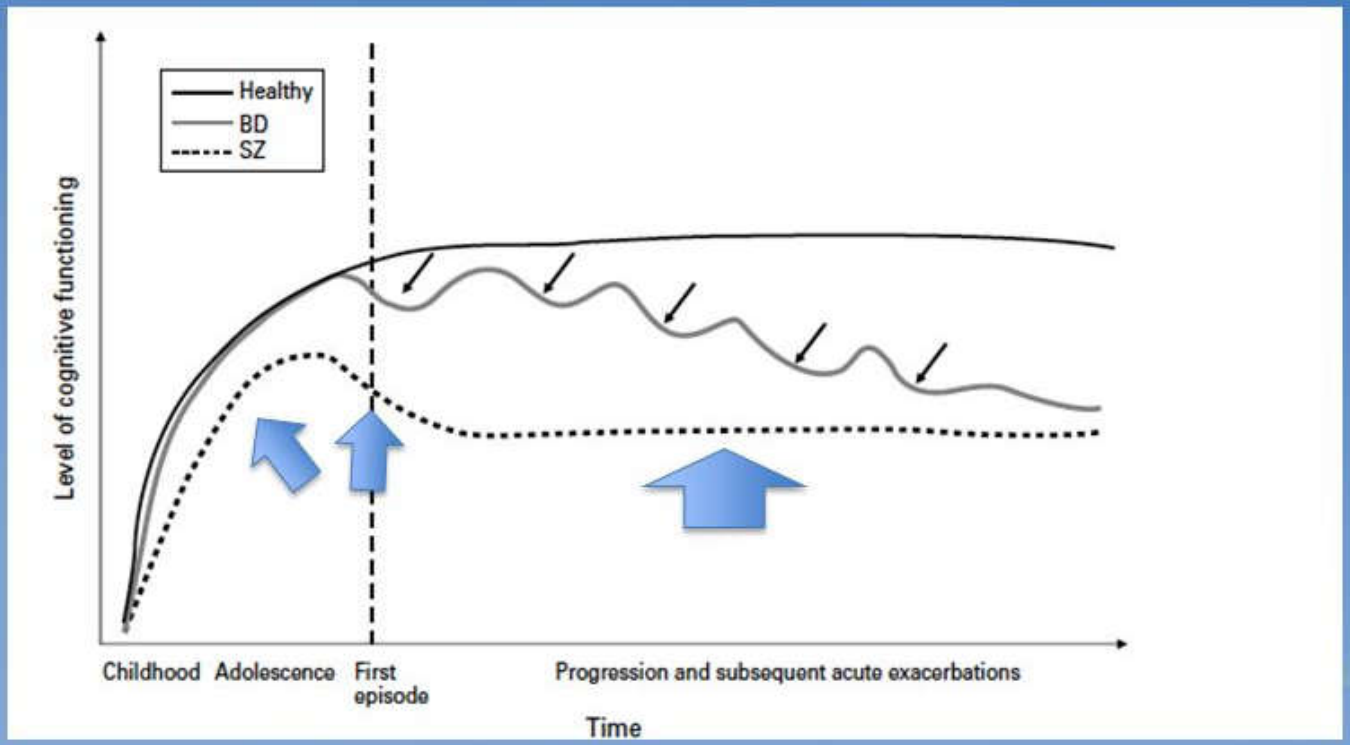



[a]Filled symbols represent a statistically significant difference between the diagnostic group and healthy comparison group at a Bonferroni-corrected level ($p \leq 0.007$). Mean scores (comparison subjects set to zero) were calculated using all available diagnostic subjects per test (expressed in standardized [z] scores). Trail A=Trail Making Test, Part A; Trail B=Trail Making Test, Part B; Raven B=Raven's Colored Progressive Matrices set B; Raven AB=Raven's Colored Progressive Matrices set AB; Raven A=Raven's Colored Progressive Matrices set A.

*Am J Psychiatry 167:1, January 2010*

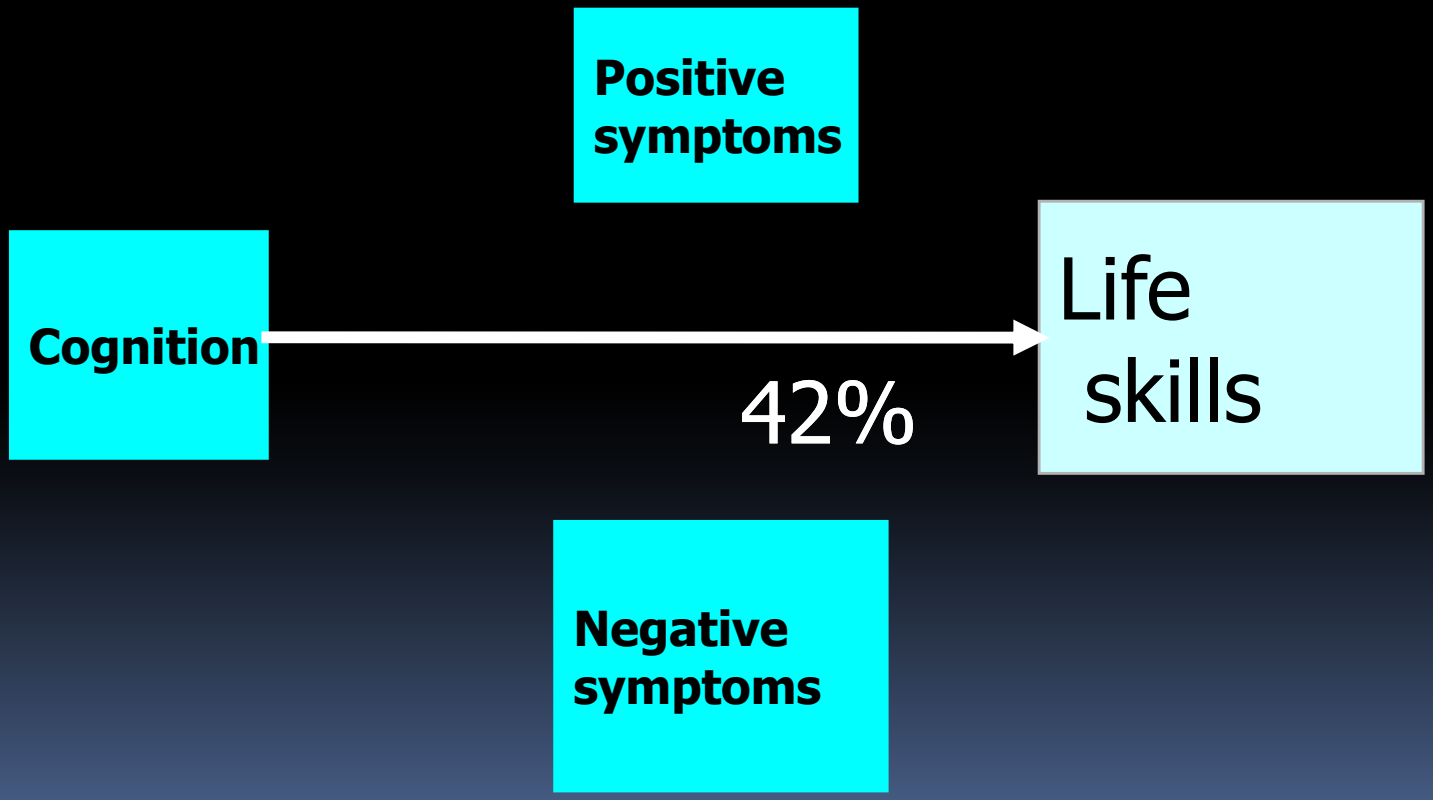
# Trajectory of Cognitive Deficits

Lewandowski *et al.* Psychol Med. 2011 Feb;41(2):225-41.

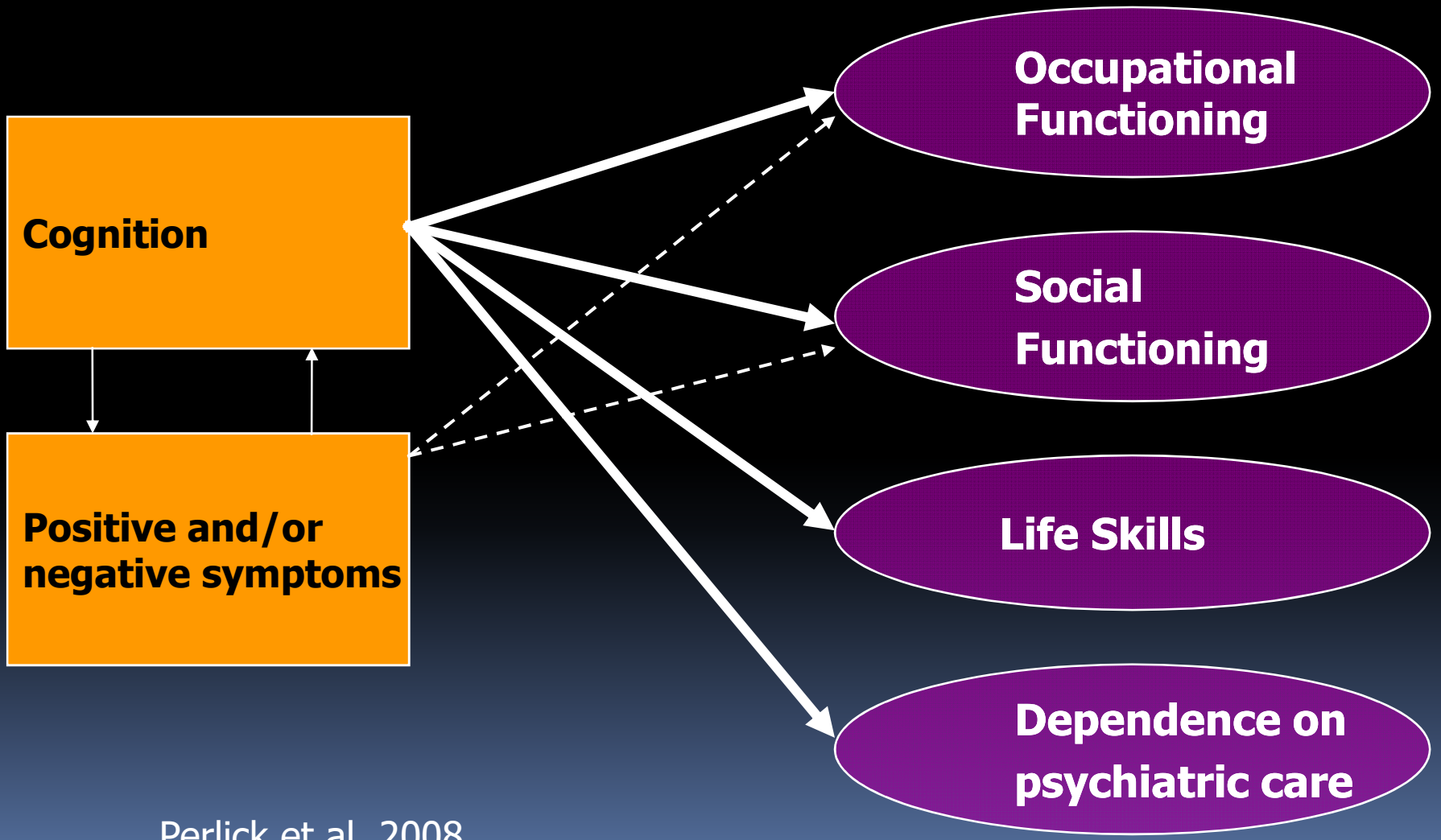


# Life Skills

Velligan *et al 1999*



# Thinking, symptoms and outcomes




Perlick et al, 2008

# What do we know about cognition in schizophrenia?

- Definition of schizophrenia
  - Cognition is important (Kraepelin and Bleuler)
  - DSMV considering cognition as a diagnostic adjunct

- Cognitive disturbances present
  - before onset
  - during episodes
  - between episodes of acute symptoms

# About cognitive difficulties in schizophrenia

- Start early – before onset
- Persist even when symptoms are absent
- Interfere with functioning outcomes
- Not related to medication (although it can make them worse)

*Till Wykes, 2011*

# DEFICIT COGNITIVI NELLA SCHIZOFRENIA ED ESITI DISFUNZIONALI

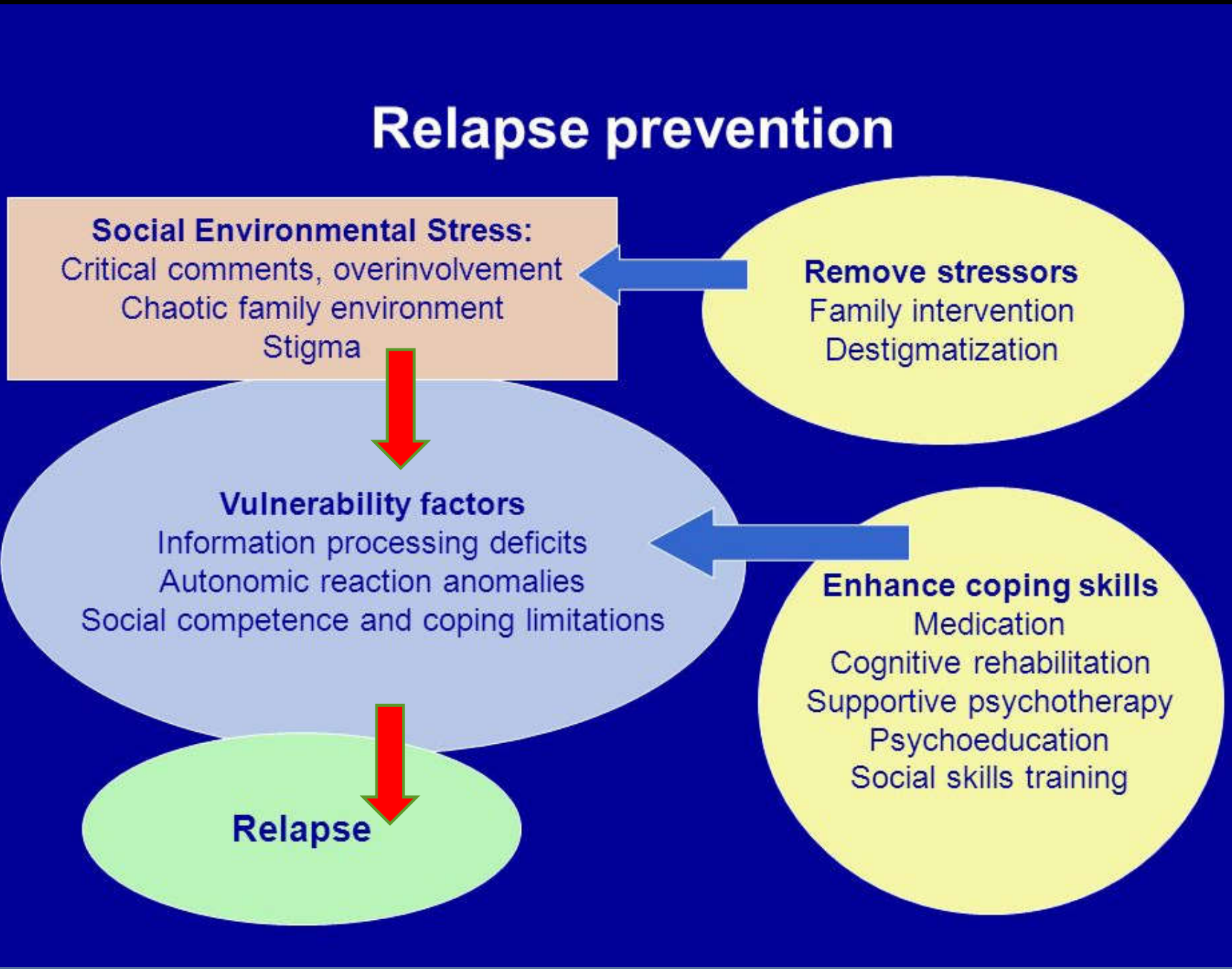
| Funzioni cognitive | deficit cognitivi | Esiti disfunzionali |
|---|---|---|
| **Attenzione** | Deficit nella capacità di selezionare gli stimoli rilevanti ed irrilevanti | **Gestione personale. Competenze sociali. Social Problem Solving** |
| **Memoria** | Deficit nell'accesso all'informazione già immagazzinata e della "Consapevolezza di Conoscenza" | Abitare, nutrirsi, vestirsi |
| **Funzioni Esecutive** | Deficit nell'elaborazione dell'informazione, nell'organizzazione e nella pianificazione di azioni finalizzate | Mezzi di trasporto; Gestione del denaro |
| **Linguaggio** | Alogia, deficit di simbolizzazione e di comprensione verbale | Cura della salute fisica; Corretta compliance |
| **Metarappresentazione** | Incapacità di comprendere il contesto, anomalie pragmatiche della comunicazione | Lavoro, relazioni sociali |

# Gran parte del deficit funzionale è associato ad anomalia delle Funzioni Esecutive

- Programmazione, controllo e verifica dell'attività *(Luria 1966)*
- Formulazione degli scopi, pianificazione, portar avanti in maniera efficace piani finalizzati *(Lezak 1983)*
- Comportamento di problem-solving, elaborare ipotesi ed apprendere dai tentativi falliti *(Shallice 1988)*
- In caso di deficit di funzioni esecutive si può essere in grado di operare azioni routinarie, ma è difficoltoso agire in situazioni nuove *(Baddeley and Wilson 1988)*
- Sia l'esperienza clinica che di ricerca ci dicono che anomalie nel funzionamento esecutivo provocano disfunzionalità sociale *(Crepeau and Scherzer 1993)*

- Concentrarsi
- Acquisizione delle abilità sociali
- *Decodificazione* degli stimoli sociali
- Risoluzione di situazioni problematiche
- Espressione di concetti
- Prendere decisioni
- Svolgimento di un compito e sua portata a termine

# Relapse prevention



# Cognition and Functional Outcome in Schizophrenia

- Cognitive deficits are reliable correlates and predictors of functional outcome (disability)
- Functional outcome includes: work outcome, social outcome, independent living, & skills acquisition
- Magnitude of associations: medium for specific domains; large for summary scores
- Relationships are stronger than between psychotic symptoms & functional outcome
- Cognitive deficits are linked to success in psychiatric rehabilitation

Avolizione

Deficit Espressivo

Sintomi Negativi[1]

Velocità di elaborazione

Attenzione

Memoria di lavoro

Apprendimento Verbale

Apprendimento Visivo

"Problem Solving"

Deficit Neurocognitivi[2]

Outcome Funzionale

Percezione Sociale

Teoria della Mente

Ragionamento sociale

Deficit della Cognizione Sociale[3]

[1]Addington et al. Can J Psychiatry 2003; [1]Harvey & Strassnig World Psychiatry 2013; [1]Galderisi et al, Schizophr Res 2013; [1] Mucci et al Eur Psychiatry; [1,2,3]Galderisi et al, World Psychiatry; [2]Dickerson F, et al. Schizophr Res 1999; [2]Green MF, et al. Schizophr Bull 2000; [3]Couture et al. Schizophr Bull 2006; [3]Green et al, Arch Gen Psychiatry 2012; [3]Harvey & Strassnig World Psychiatry 2013; [3]Reickmann et al, Schizophr Res 2005.

# *Schizofrenia e deficit cognitivi*

- *Incapacità più o meno elevata nel selezionare gli stimoli rilevanti ed escludere quelli non rilevanti*

- *Incapacità di mantenere e dirigere selettivamente l'attenzione*

- *Incapacità di pensare in modo astratto e di trarre delle conclusioni corrette in modo deduttivo e analogico o di evocare risposte appropriate a causa dell'interferenza di risposte in competizione tra loro*

# *I disturbi di base nell'elaborazione delle informazioni hanno effetti…*

- *Sulla capacità di compiere funzioni mentali complesse come ad es. formarsi un'opinione*

- *Sull'emotività*

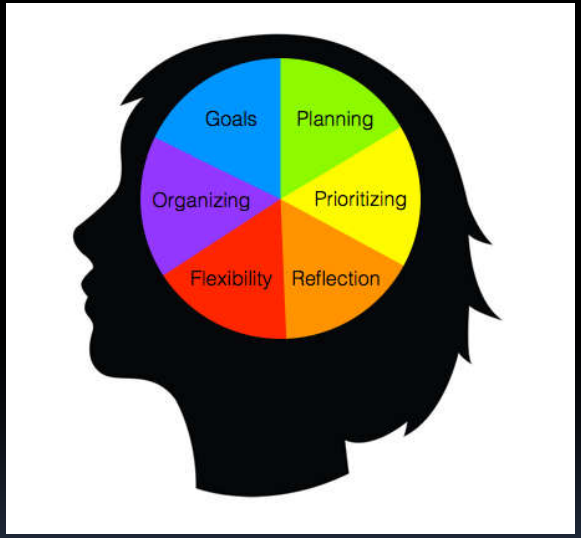
- *Sul comportamento manifesto*

- *Sulle abilità di coordinare pensieri ed idee con i processi percettivi e di adattare l'organizzazione interna delle informazioni alle richieste dell'ambiente*

# *Le funzioni esecutive*

- *Le funzioni esecutive sono un'insieme di abilità cognitive che controllano e regolano la maggior parte di ciò che facciamo nella vita quotidiana*

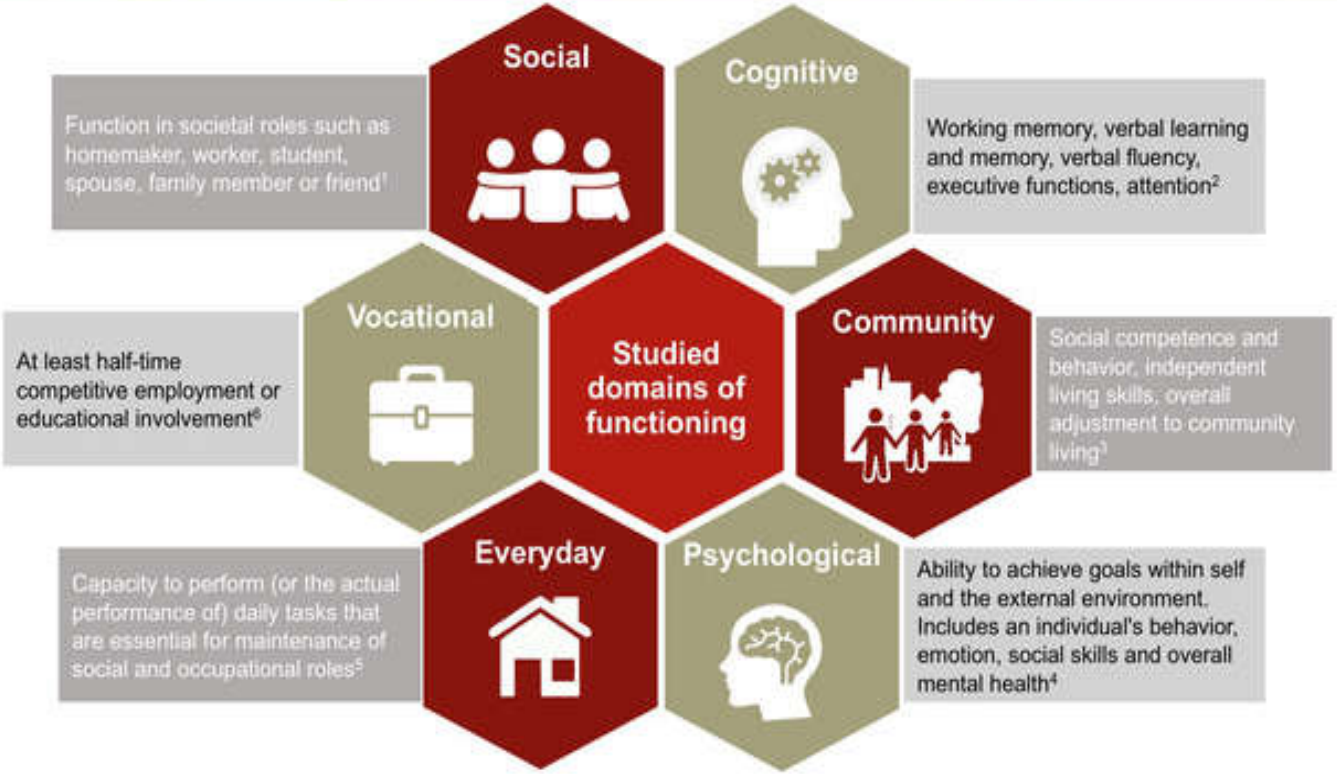
- *Includono le abilità di iniziare, pianificare e organizzare, scegliere gli obiettivi, risolvere problemi, regolare le emozioni e monitorare il comportamento*



# Domains of functioning

| Domain | Implication |
| --- | --- |
| Perception | Executive control of modes of input including perception of external (sensory) and internal (representational) stimuli |
| Cognition | Executive control of thoughts & thought processes |
| Emotion | Executive control of feelings & emotional processes |
| Action | Executive control of modes of output including behavior in external world and storage & retrieval of internal representations |

# Functioning is complex and multifactorial




1. Brissos S, et al. *Ann Gen Psychiatry*. 2011;24;10:18. 2. Bowie CR, Harvey PD . *Neuropsychiatr Dis Treat*. 2006;2(4):531–536. 3. Dickinson D, Coursey RD. *Schizophr Res*. 2002;56(1-2):161–70. 4. Preedy, Victor R. *Handbook of Disease Burdens and Quality of Life Measures*. New York: Springer, 2010. 5. Harvey PD. *Cognitive Impairment in Schizophrenia*. Cambridge: Cambridge University Press, 2013. 6. Liberman RP, et al. *Int Rev Psychiatry*. 2002;14(4):256–272.

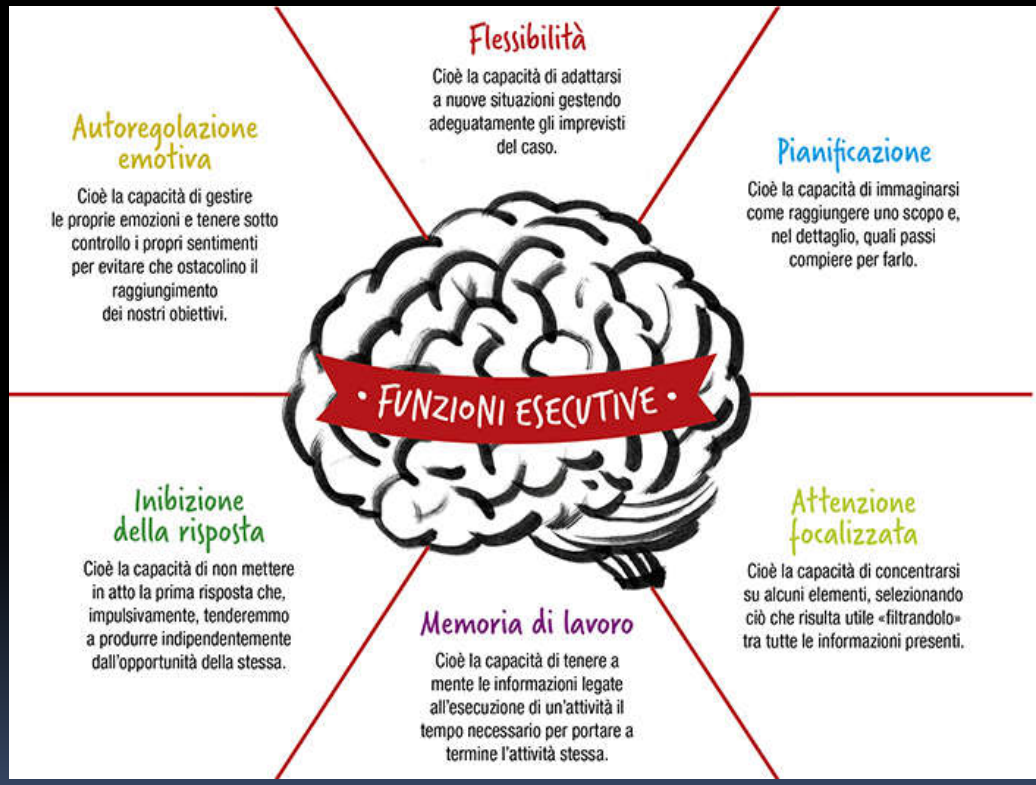
Lundbeck Institute
Campus

# *F.E. e schizofrenia*

- *Le funzioni esecutive comprendono una vasta gamma di processi cognitivi che conducono ad un comportamento mirato*

- *Studi recenti hanno mostrato che molti pazienti schizofrenici presentano difficoltà con alcuni o tutti questi processi*

- *I pazienti schizofrenici presentano difficoltà nell'adattarsi ai cambiamenti nel loro ambiente che richiedono differenti risposte comportamentali*



## PROCESSI

- Flessibilità
- Individuare e mantenere un set
- *Shifting* cognitivo

- Inibizione (controllo inibitorio)

- Pianificazione
- Monitoraggio (uso del feedback)

- Formazione di concetti

## COMPORTAMENTI

- Compiti multipli
- Passare da un pensiero all'altro
- Passare da un comportamento all'altro

- Controllo degli impulsi

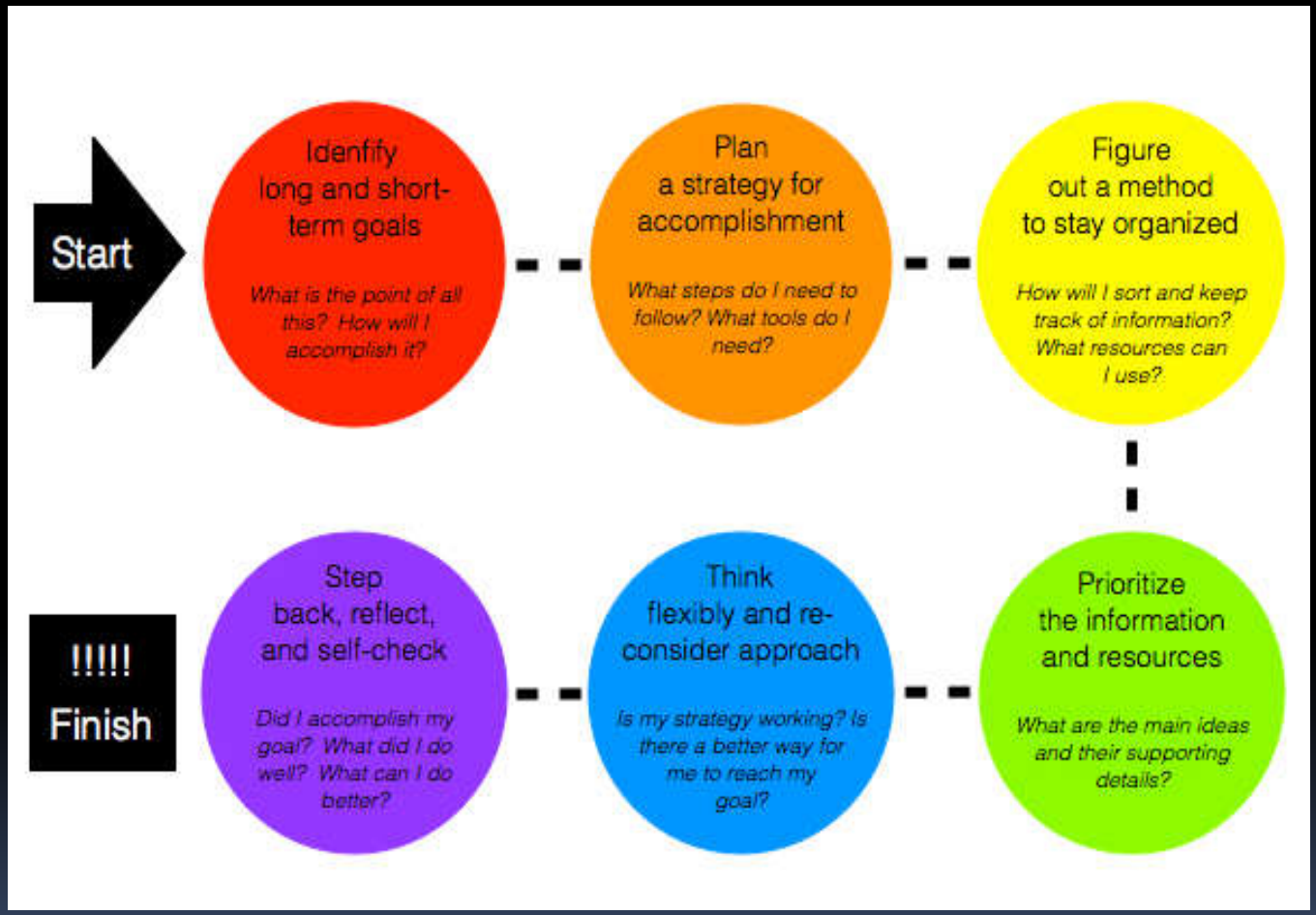
- Problem solving
- Abilità organizzative

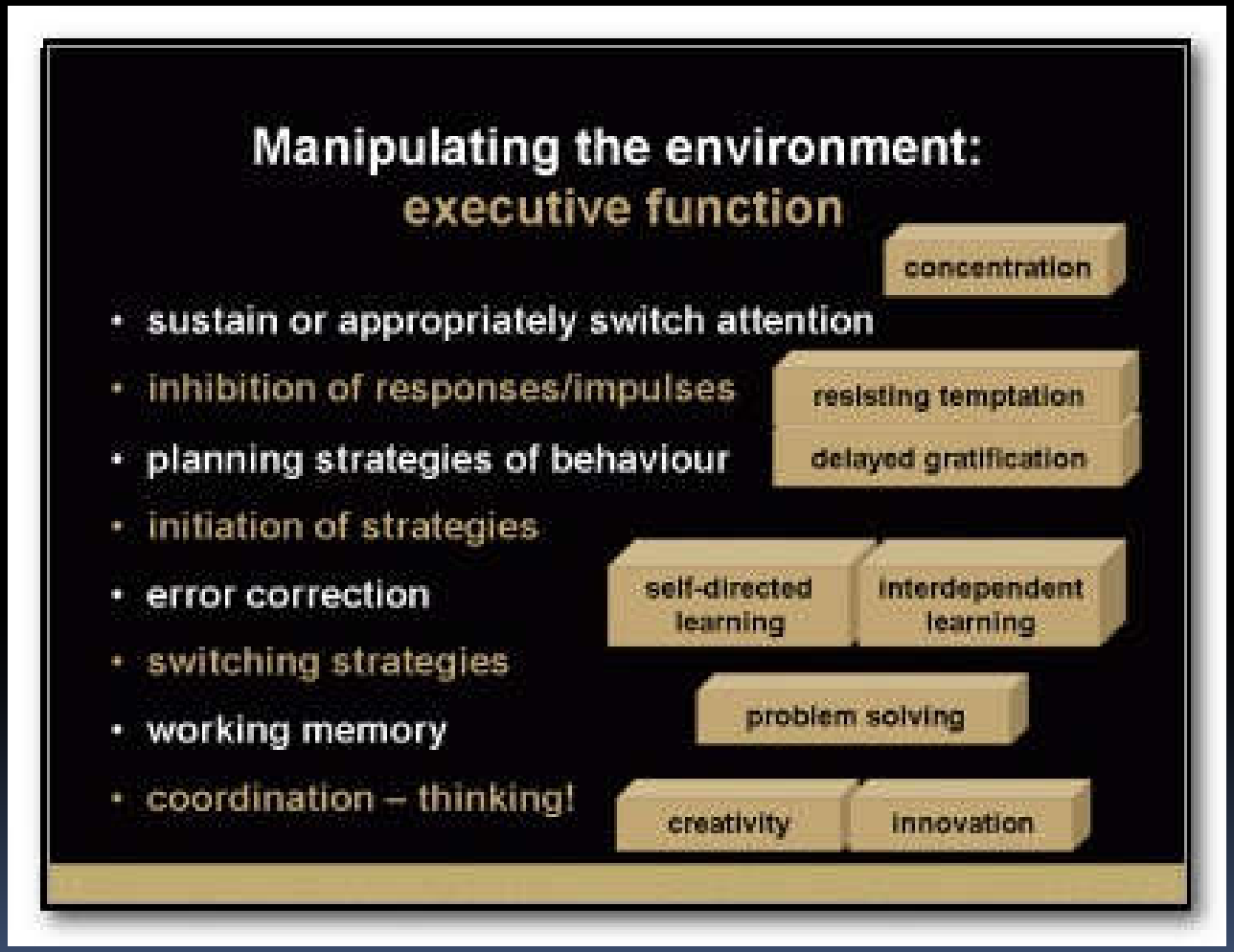
- Ragionamento deduttivo
- Categorizzazione

*Tutto ciò che serve per il comportamento finalizzato*

# Quando si usano le FE

- Apprendimento di nuove azioni
- Azioni che implicano pianificazione e decision-making
- Azioni in cui è necessario correggere gli errori
- Comportamenti nuovi che richiedono l'esecuzione di una nuova sequenza di azioni
- Azioni difficili o pericolose
- Attività in cui è necessario un costante monitoraggio del proprio comportamento
- Azioni in cui in cui bisogna superare forti risposte abituali


Start
Idenfify long and short-term goals
What is the point of all this? How will I accomplish it?
Plan a strategy for accomplishment
What steps do I need to follow? What tools do I need?
Figure out a method to stay organized
How will I sort and keep track of information? What resources can I use?
Prioritize the information and resources
What are the main ideas and their supporting details?
Think flexibly and re-consider approach
Is my strategy working? Is there a better way for me to reach my goal?
Step back, reflect, and self-check
Did I accomplish my goal? What did I do well? What can I do better?
!!!!! Finish


Manipulating the environment:
executive function
concentration
• sustain or appropriately switch attention
• inhibition of responses/impulses
resisting temptation
• planning strategies of behaviour
delayed gratification
• initiation of strategies
• error correction
self-directed learning
interdependent learning
• switching strategies
problem solving
• working memory
• coordination – thinking!
creativity
innovation

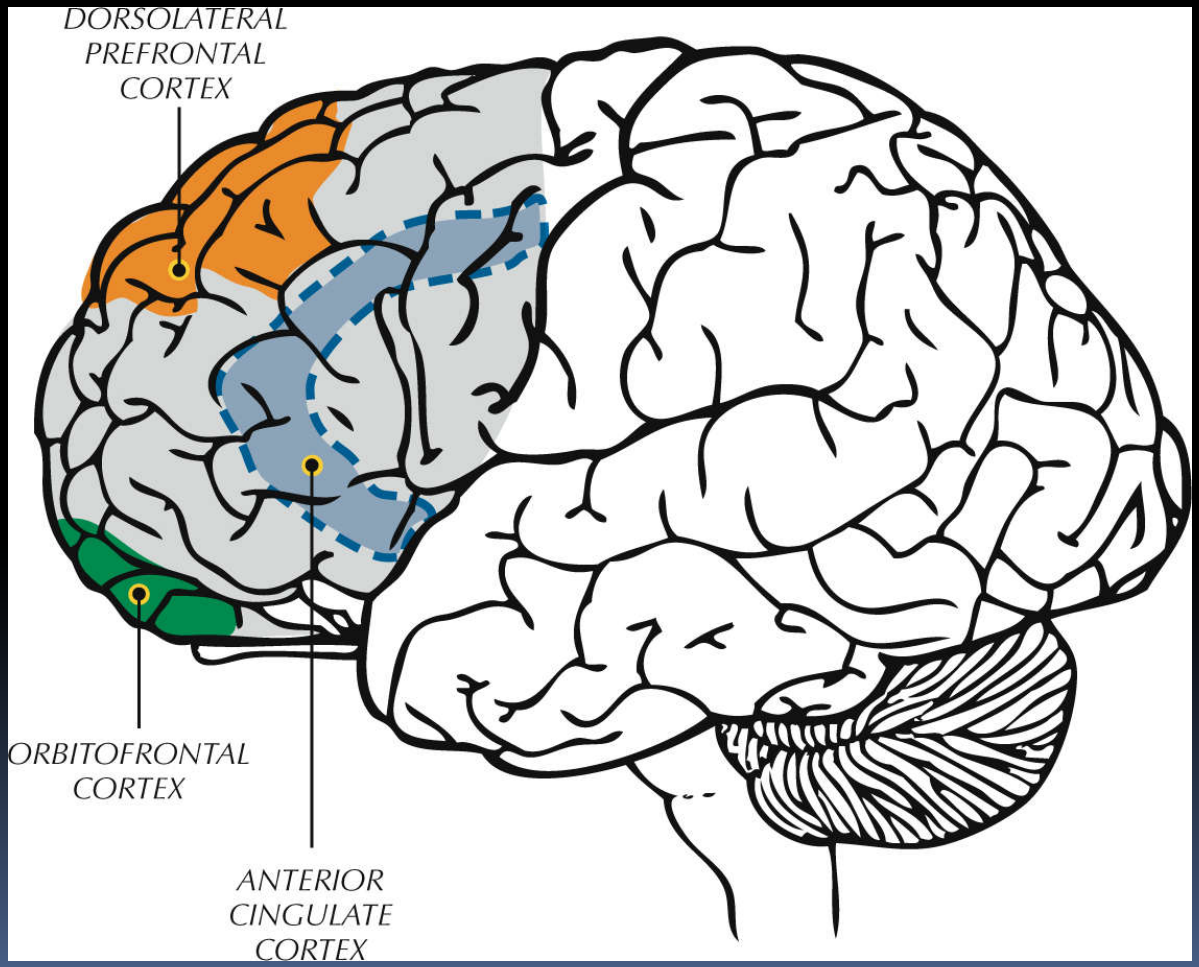
# Il direttore d'orchestra…

***"I deficit cognitivi nella schizofrenia sono come un'orchestra senza direttore…"***

***E. Kraepelin, 1919***

La regione frontale è stata spesso paragonata ad un direttore d'orchestra che riceve dalle restanti zone cerebrali le informazioni relative all'ambiente esterno ed interno e ai segnali emotivi e motivazionali e li utilizza per decidere e pianificare i comportamenti futuri controllando l'attività dei singoli moduli cerebrali.

# *Dove sono le sedi delle funzioni esecutive ?*



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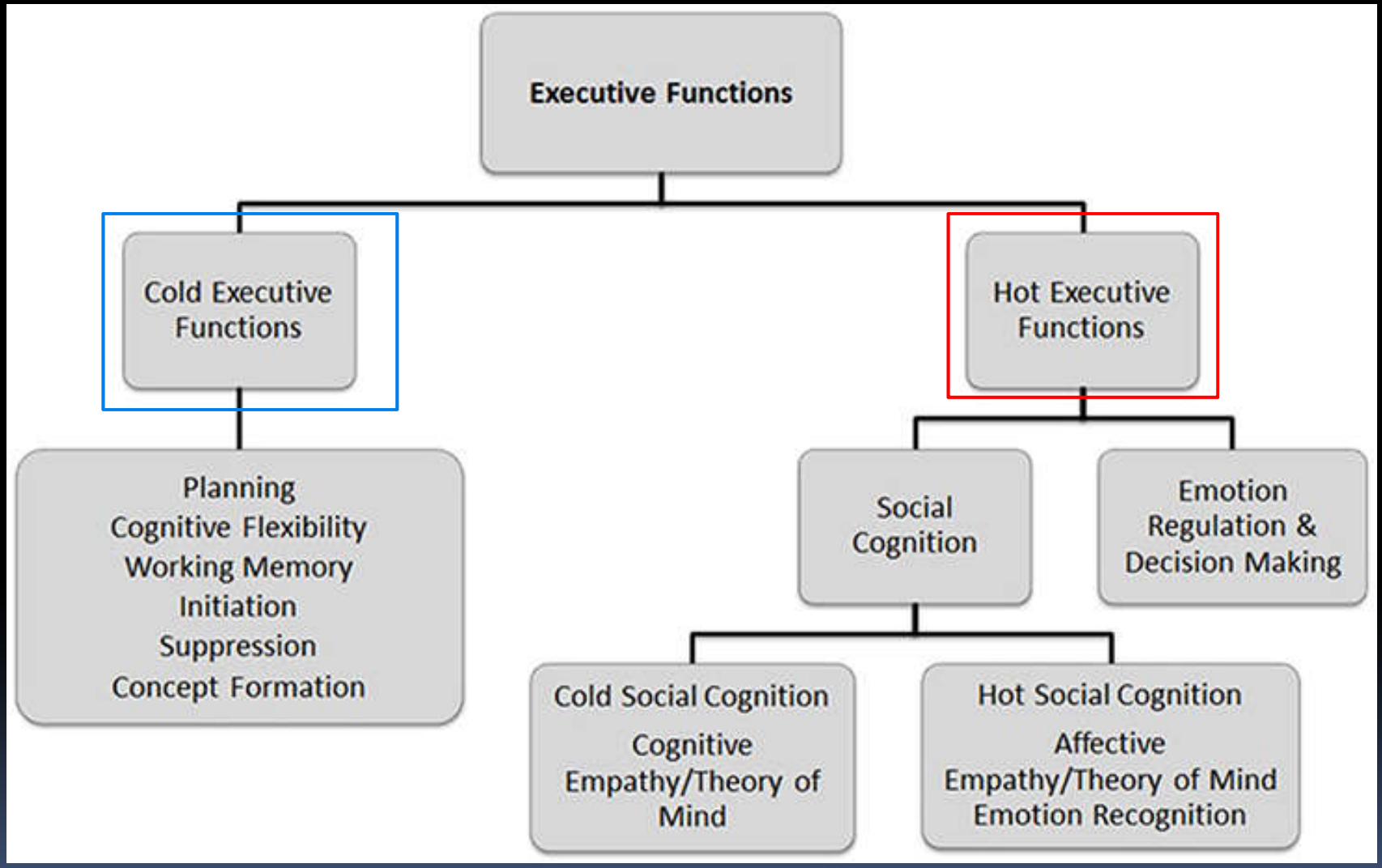
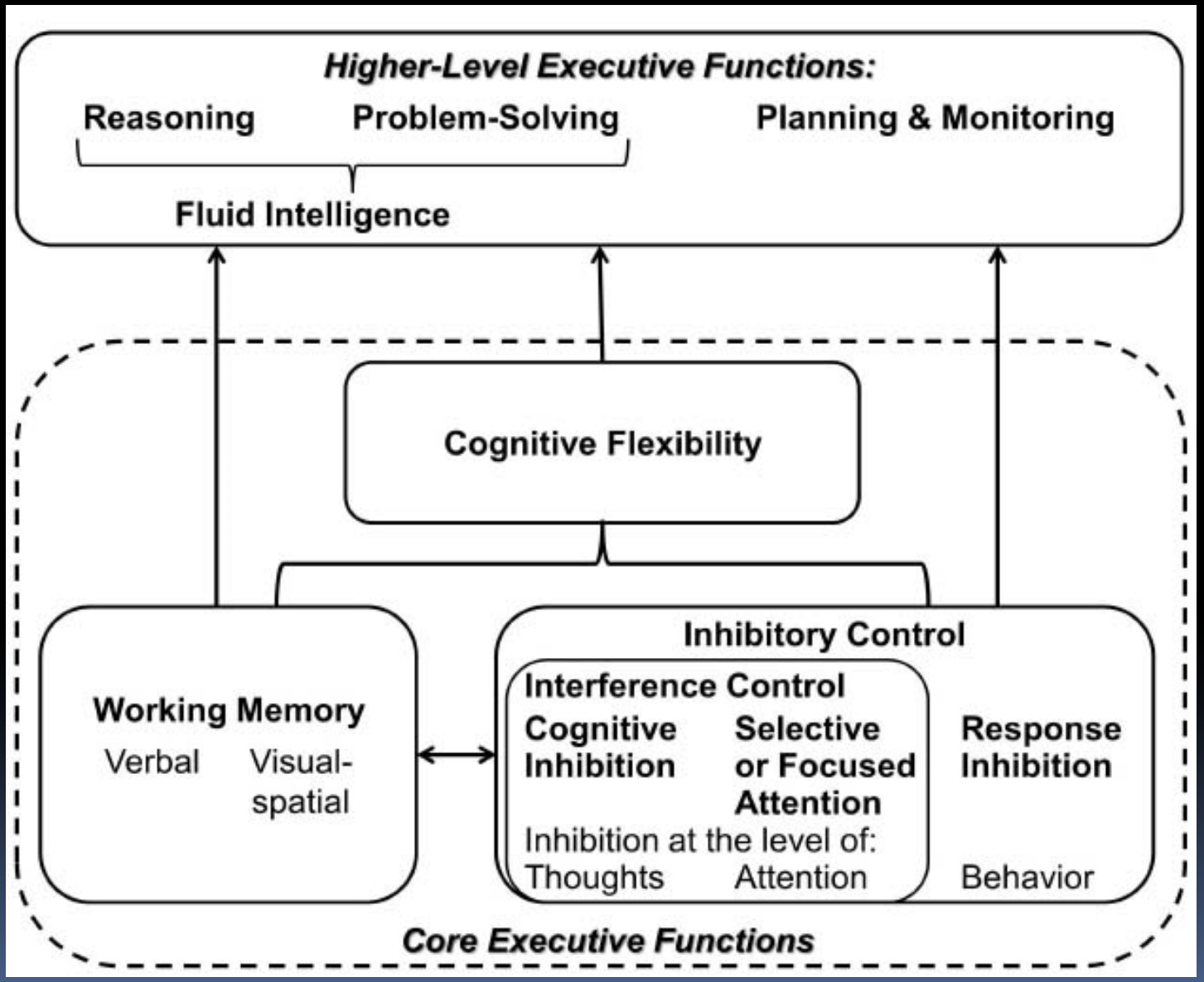

Executive Functions
Cold Executive Functions
Hot Executive Functions
Planning
Cognitive Flexibility
Working Memory
Initiation
Suppression
Concept Formation
Social Cognition
Emotion Regulation & Decision Making
Cold Social Cognition
Cognitive Empathy/Theory of Mind
Hot Social Cognition
Affective Empathy/Theory of Mind
Emotion Recognition

Thinking
Prioritizing / Time Management
Organization
Working Memory
Metacognition / Reflection
Self-Regulation
Task Initiation
Flexibility
Behavioral Control
Self-Monitoring
www.aspecialsparkle.com
©Christine Reeve


Higher-Level Executive Functions:
Reasoning
Problem-Solving
Planning & Monitoring
Fluid Intelligence
Cognitive Flexibility
Working Memory
Verbal
Visual-spatial
Inhibitory Control
Interference Control
Cognitive Inhibition
Selective or Focused Attention
Response Inhibition
Inhibition at the level of:
Thoughts
Attention
Behavior
Core Executive Functions

# *Le funzioni esecutive*

- ***Pensiero generativo*** *(creatività, flessibilità cognitiva)*

- ***Drive Goal*** *(spinta all'azione)*

- ***Inibizione della risposta*** *(ad es. delle informazioni irrilevanti e degli impulsi)*

- ***Mantenimento di uno schema d'azione*** *(portare a termine un compito)*

- ***Pianificazione*** *(organizzazione del pensiero e dell'azione)*

- ***Automonitoraggio*** *(monitorare e valutare la prestazione)*

# Executive Functioning Deficits

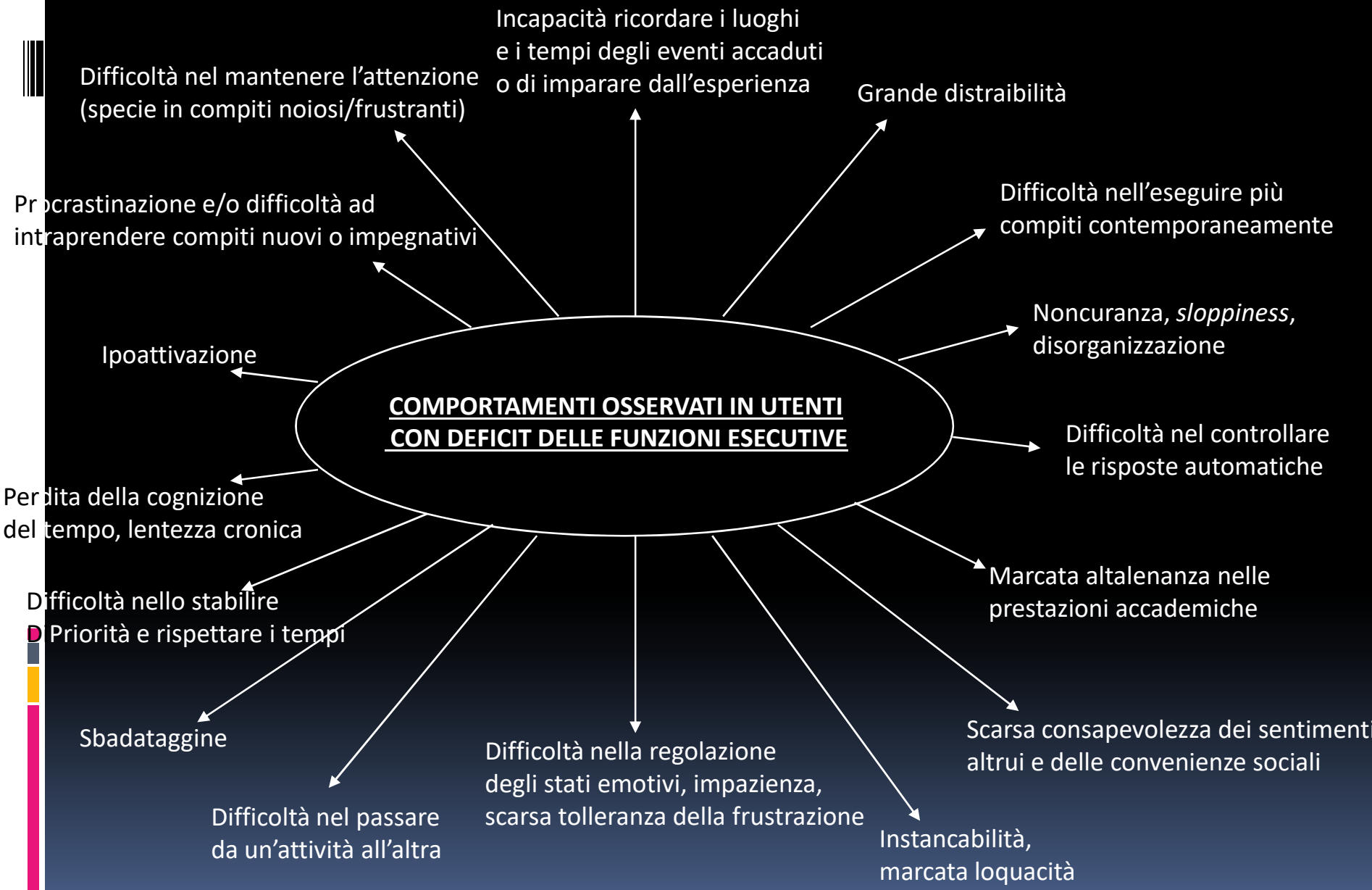
- Difficulties accessing knowledge
- Concrete thinking
- Emotional lability
- Poor frustration tolerance
- Disorganized
- Inconsistent performance on tasks within ability range
- Difficulties coping with change
- Poor judgment

Harcourt Assessment
The Psychological Corporation

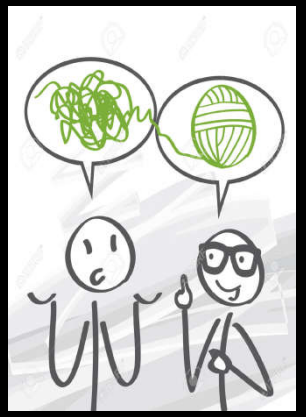
# Executive Functioning Deficits

- Disinhibition - lacks behavioral control, impulsive
- Perseveration - repeats non-functional behavior, inability to change behavior despite corrective feedback, difficulties learning from experience
- Forgetfulness - off-task behaviors, mental errors, loses track of what they were doing
- Inefficiency - takes more steps to complete task than necessary
- Difficulty understanding consequences and cause-effect relationships
- Frequently violate rules despite apparent knowledge of the rules
- Apathetic - lacks motivation, does not set goals, engages in behavior only when prodded

Harcourt Assessment
The Psychological Corporation


COMPORTAMENTI OSSERVATI IN UTENTI CON DEFICIT DELLE FUNZIONI ESECUTIVE
Difficoltà nel mantenere l'attenzione (specie in compiti noiosi/frustranti)
Incapacità ricordare i luoghi e i tempi degli eventi accaduti o di imparare dall'esperienza
Grande distraibilità
Procrastinazione e/o difficoltà ad intraprendere compiti nuovi o impegnativi
Difficoltà nell'eseguire più compiti contemporaneamente
Noncuranza, *sloppiness*, disorganizzazione
Ipoattivazione
Difficoltà nel controllare le risposte automatiche
Perdita della cognizione del tempo, lentezza cronica
Marcata altalenanza nelle prestazioni accademiche
Difficoltà nello stabilire Priorità e rispettare i tempi
Scarsa consapevolezza dei sentimenti altrui e delle convenienze sociali
Sbadataggine
Difficoltà nella regolazione degli stati emotivi, impazienza, scarsa tolleranza della frustrazione
Difficoltà nel passare da un'attività all'altra
Instancabilità, marcata loquacità

# *Esempi di deficit F.E.*



- ***Non riesce ad ascoltare a lungo:*** *deficit attenzione*
- ***Non riesce a rispettare il proprio turno nel parlare:*** *deficit inibizione*
- ***Non riesce a svolgere operazioni a memoria:*** *deficit memoria di lavoro*
- ***Ha difficoltà a riprendere un'attività dopo un'interruzione:*** *deficit flessibilità cognitiva*
- ***Non riesce ad organizzare un compito:*** *deficit pianificazione*
- ***E' in difficoltà quando deve iniziare un compito, continua a procrastinare:*** *deficit spinta all'azione*

# Esempi di stili comportamentali

- ***Igiene personale :***

***Può indossare gli stessi vestiti perché sono quelli che trova per primi vicino al letto***

- ***Aderenza ai farmaci:***

***Può non assumere i farmaci a causa della disorganizzazione che c'è in casa***

- ***Lavoro/Studio:***

***Può essere in difficoltà nel completare i compiti a causa di fattori distraenti o perché manca una costante supervisione***

- ***Tempo libero:***

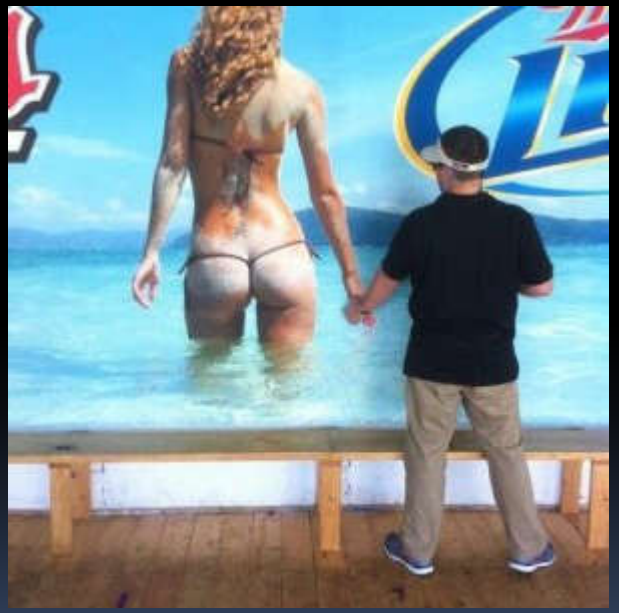
***Può non essere capace di identificare attività piacevoli o di completare i passi necessari***

# *Sintomi principali*

- *Abulia*
- *Apatia*
- *Ipoattività*
- *Distraibilità*
- *Impulsività*
- *Disinibizione*

# *Conseguenze relazionali*

- ***Difficoltà nel fare e mantenere amicizie***
- ***Reazioni come isolamento, impotenza, rabbia, tristezza***
- ***Deficit di cognizione sociale***
- ***Fallimento nella riabilitazione***



# "SCENDO SUBITO" DISSE LEI...

# Vent'anni dopo
## ... non proprio ma quasi ...

### *Dopo iniziale pessimismo*

- *Allenamento di abilità sociali e di rimedio cognitivo non garantiscono attendibili benefici, non se ne raccomanda l'utilizzo nella pratica clinica.* Pilling et al., 2002. *Psychol Med*
- *Dato il limitato numero di studi inclusi, non si giunge a risultati conclusivi che permettano di ottenere evidenze pro o contro la riabilitazione neurocognitiva nel trattamento della schizofrenia.* Hayes and Grath 2003. *The Cochrane Library*

### Ora

- Il rimedio cognitivo è un trattamento efficace per diversi disturbi psichiatrici. Lee et al., 2013. *Psychol Med*
- Il rimedio cognitivo per la schizofrenia si è dimostrato efficace nel migliorare sia la cognitività che l'esito funzionale indipendentemente dal tipo di metodologia utilizzata. Medalia & Saperstein, 2013.

# Psychosocial Support

- **Kay (1992)**
- Psychosocial approaches should be used in conjunction with cognitive rehab to address both organic brain damage and psycho-emotional effects of brain injury
  - achieved through the client therapist relationship
  - by involving the client this:

  a) increases control over their situation

  b) decreases feelings of victimization/ discouragement

# Principi di base della Riabilitazione Cognitiva

## Neurogenesi

Si riferis… …duzione di nuovi neuroni, si verifi… …ll'adulto (Eriksson 1998; …n 1999)

…no connessioni

…imoli, esercizio, …00)

- ↓ da stress, invecchiamento, e elevati livelli di glucocorticoidi (Gould 2000)

La capacità dei neu… …ioli modificando la forza de… …iche, la citoarchitettura, la co… …ttività

Il cervello non è "fisso", … …ontro ad un continuo rimodellamen… …orfologico

## Riabilitazione Cognitiva

La riabilitazione cognitiva fonda i suoi presupposti teorici sulle proprietà plastiche del cervello adulto

La maggior parte degli interventi si basa su ipotesi di riorganizzazione funzionale e di apprendimento

# Definizione di Rimedio Cognitivo

**"…un intervento finalizzato al miglioramento delle funzioni cognitive (attenzione, memoria, funzioni esecutive, cognizione sociale o metacognizione) in maniera duratura e generalizzabile"**

**Cognitive Remediation Experts Workshop, Cellard C et al, In: Ritsner MS (ed) Handbook of schizophrenia spectrum disorders, Vol III, Springer, 2011**

# Evidenze di neuroplasticità

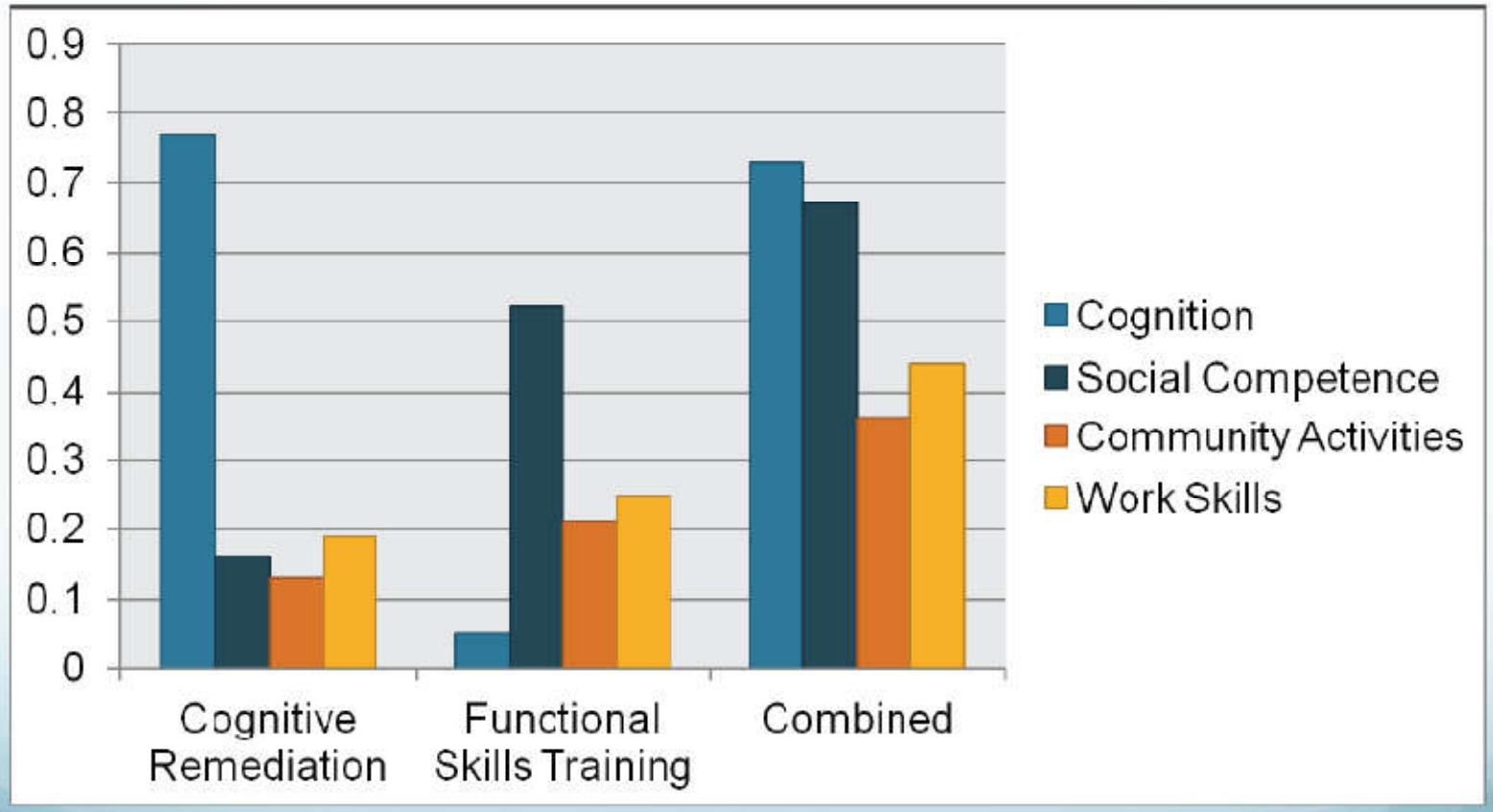
- I livelli di BDNF (fattore neurotrofico cerebrale) aumentano dopo trainin cognitivo. BDNF proposto biomarker periferico degli effetti del training (Vinogradov et al., 2009)
- Brain Imaging (fMRI e DTI):
  - Incremento attivazione nei lobi frontali
    - a) Regioni associate alla working memory (Wykes et al., 2002)
    - b) Area di Broca' (Vianin et al., 2014)
  - Attivazione delle reti cerebrali significativamente cambiato nel senso di normalizzazione ed in sostanza bianca aumento dell'indice di anisotropia frazionaria nella parte anteriore del corpo calloso.
  - I miglioramenti cognitivi ed i cambiamenti funzionali e strutturali hanno mostrato correlazioni significative (Penadés et al., 2013).
  - Gli studi di neuroimaging nei pazienti sottoposti a rimedio cognitivo suggeriscono un effetto positivo sul funzionamento cerebrale in termini di riorganizzazione funzionale delle reti neurali (Penadés et al., 2017).

# A Meta-Analysis of Cognitive Remediation for Schizophrenia: Methodology and Effect Sizes

- 2.104 partecipanti
- effetti soddisfacenti e duraturi su cognitività e funzionamento
- effetti sui sintomi modesti e non duraturi
- non grandi differenze tra diversi tipi di approccio (approcci "strategici" più efficaci)
- più efficaci nei pazienti clinicamente stabili
- più efficaci sul funzionamento se applicati in aggiunta a riabilitazione

**Wykes, Am Jou Psychiatry, 2011**

# Effect Sizes in Bowie et al.'s 2012 Study




*Combined Cognitive Remediation and Fucntional Skills Training for Schizophrenia: Effects on Cognition, Functional Competence and Real-World Behavior, Am Jou Psychiatry, 2012*

# Effects of Cognitive Remediation

- **Cognitive performance improvement indirectly related to changes in social functioning** (Wykes et al., 1999; Spaulding et al., 1998)
- **Cognitive Rehabilitation improved self-esteem** (Wykes et al., 1999)
- **Effect sizes for changes of psychosocial indices comparable with or larger than those of cognitive performance improvement** (Twamley et al, 2003; McGurk et al, 2007)

*Malata va a piedi a Lourdes per la grazia, ma abita a 50 metri dal santuario e le passa solo la forfora…*

Schizophrenia Research xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

# Does cognitive remediation modify the use of psychiatric services and the patterns of care of patients with schizophrenia?

Antonio Vita [a,b,*], Giacomo Deste [a], Stefano Barlati [a], Antonino Grano [b], Roberto Poli [c], Emilio Sacchetti [a,b]

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[b] University of Brescia, School of Medicine, Brescia, Italy
[c] Hospital Istituti Ospitalieri, Cremona, Italy

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ABSTRACT

The use of inpatient and outpatient psychiatric services were assessed in the 12 months before and after a cognitive remediation (CR) intervention or treatment as usual (TAU) in a sample of 84 patients with schizophrenia who previously underwent an effectiveness study of CR.

A smaller number and shorter duration of hospitalizations in acute wards and a higher total number of outpatient and rehabilitative interventions, as well as a more constant, intensive and articulated rehabilitation in the 12 months after the intervention were found in patients who received CR, compared with those who received TAU. CR may modify the use of psychiatric services and the patterns of care of patients with schizophrenia.

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# CONCLUSIONS

CR may may have a significant impact on the use of psychiatric services and pattern of care of patients with schizophrenia

**REDUCTION OF HOSPITALIZATIONS IN ACUTE PSYCHIATRIC UNIT**
*(clinical stabilization)*

**INCREASE IN OUTPATIENT SERVICE USE**
*(shift to community based settings of care)*

**ACCESS TO ADVANCED AND MORE COMPLEX REHABILITATION**
*(improved cognitive abilities)*

**POTENTIAL EFFECTS ON COSTS**
*(different use of resources)*

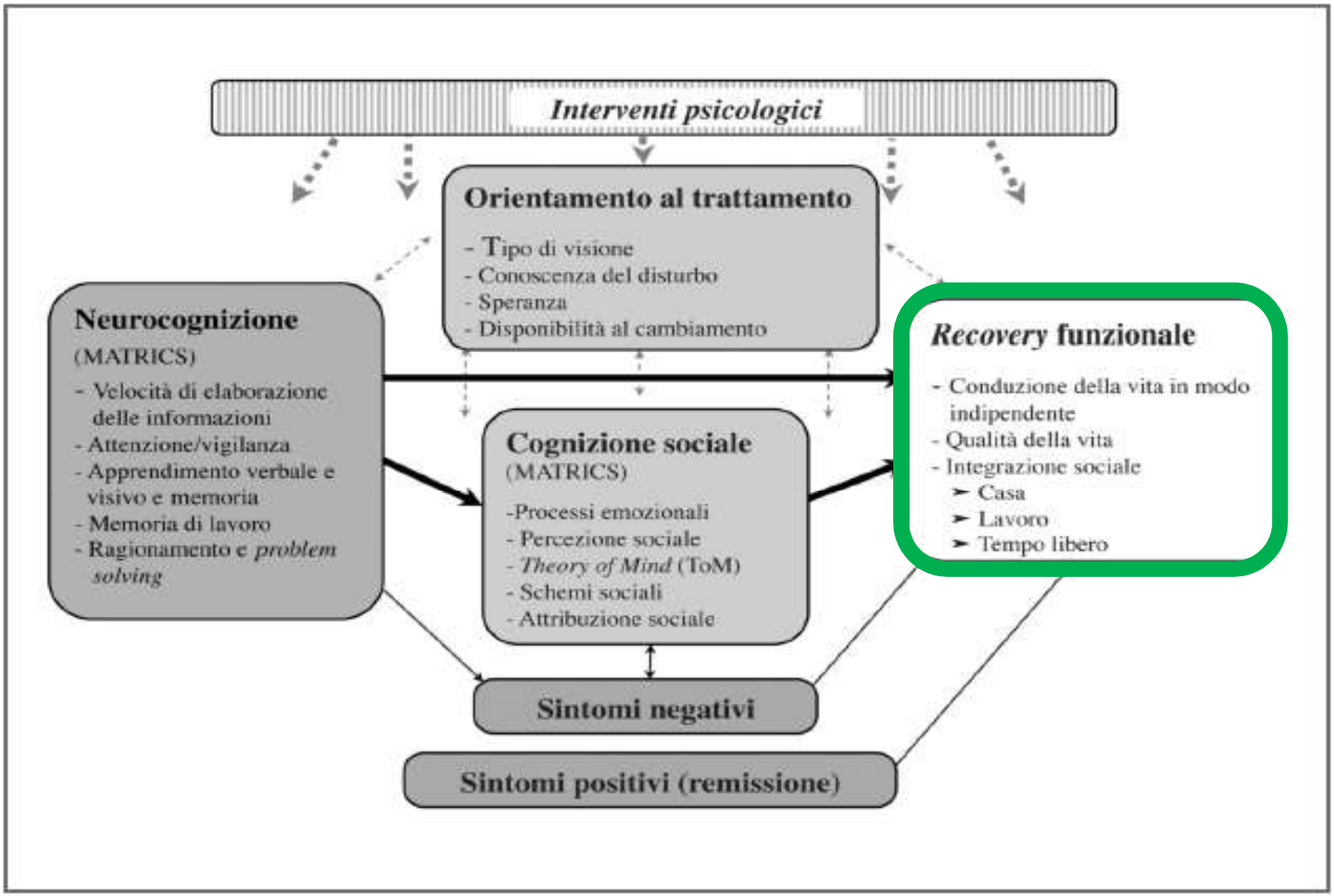



**Fig. 1.1** Modello integrato: possibili mediatori tra la cognitività e il recovery funzionale (Roder et al., 2010)

# *Razionale ed obiettivo dei trattamenti di rimedio cognitivo*

- ***Razionale:***

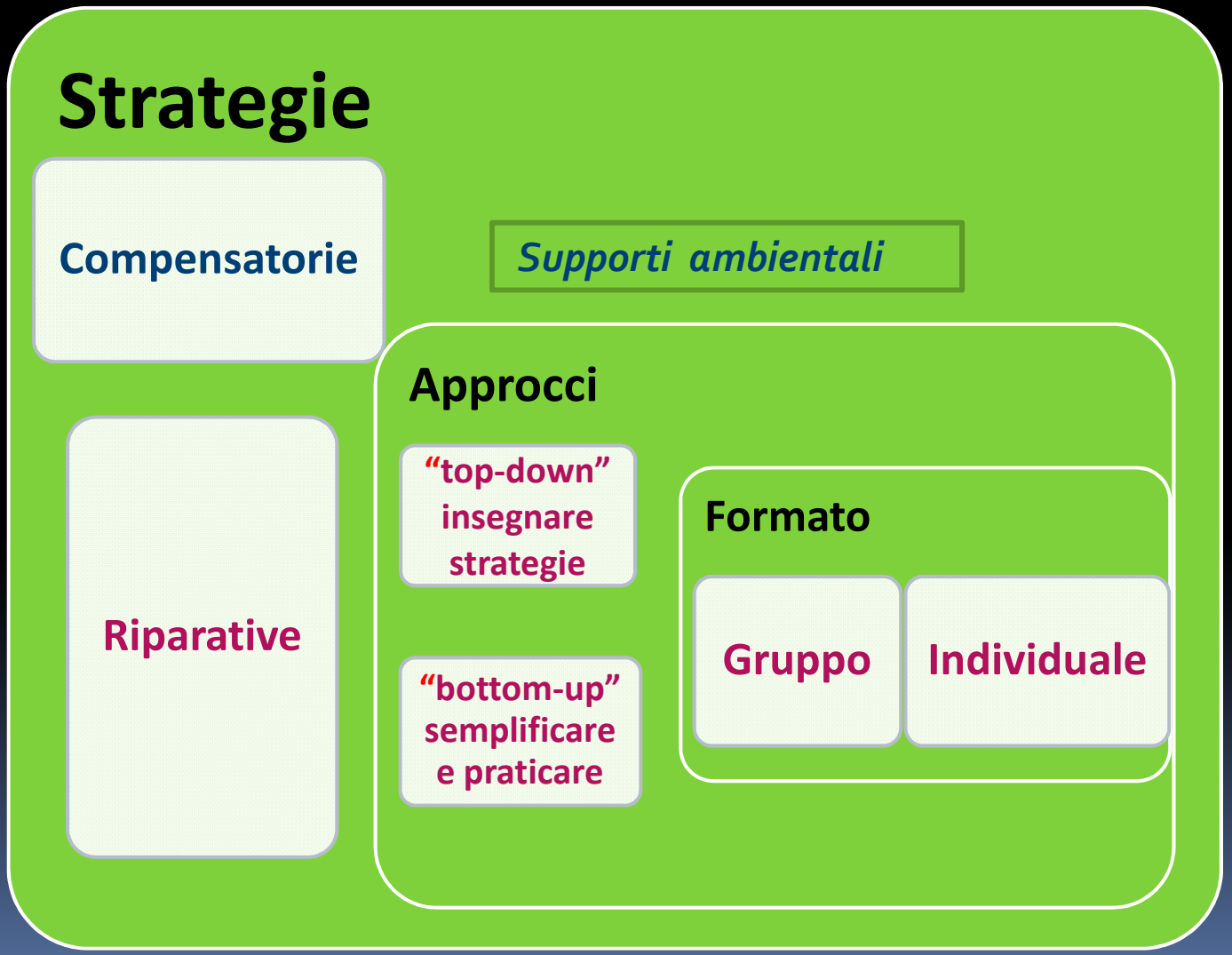
  *Coinvolgere i partecipanti nell'impiegare particolari abilità al fine di facilitare l'apprendimento e l'uso di strategie strutturate per compensare i deficit*

- ***Obiettivo:***

  *Insegnare una varietà di strategie di elaborazione dell'informazione, incoraggiando ad adottare le abilità apprese a seconda del compito e del contesto, con il fine di applicarle nella vita quotidiana*

*Vita, Barlati, 2014*

# *Rimedio cognitivo*
# *Training neurocognitivo*

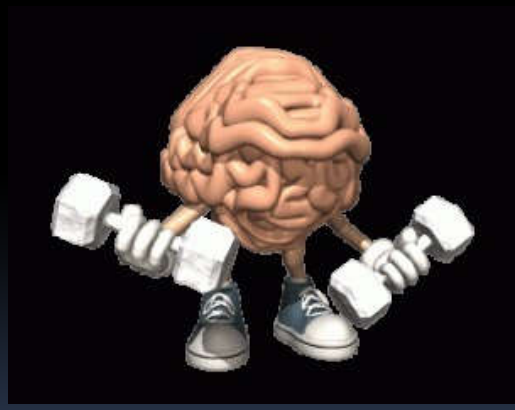


# *Interventi Psicosociali per i deficit cognitivi*

- ***Interventi di rimedio cognitivo di tipo riparativo (es. Cogpack, PST)***

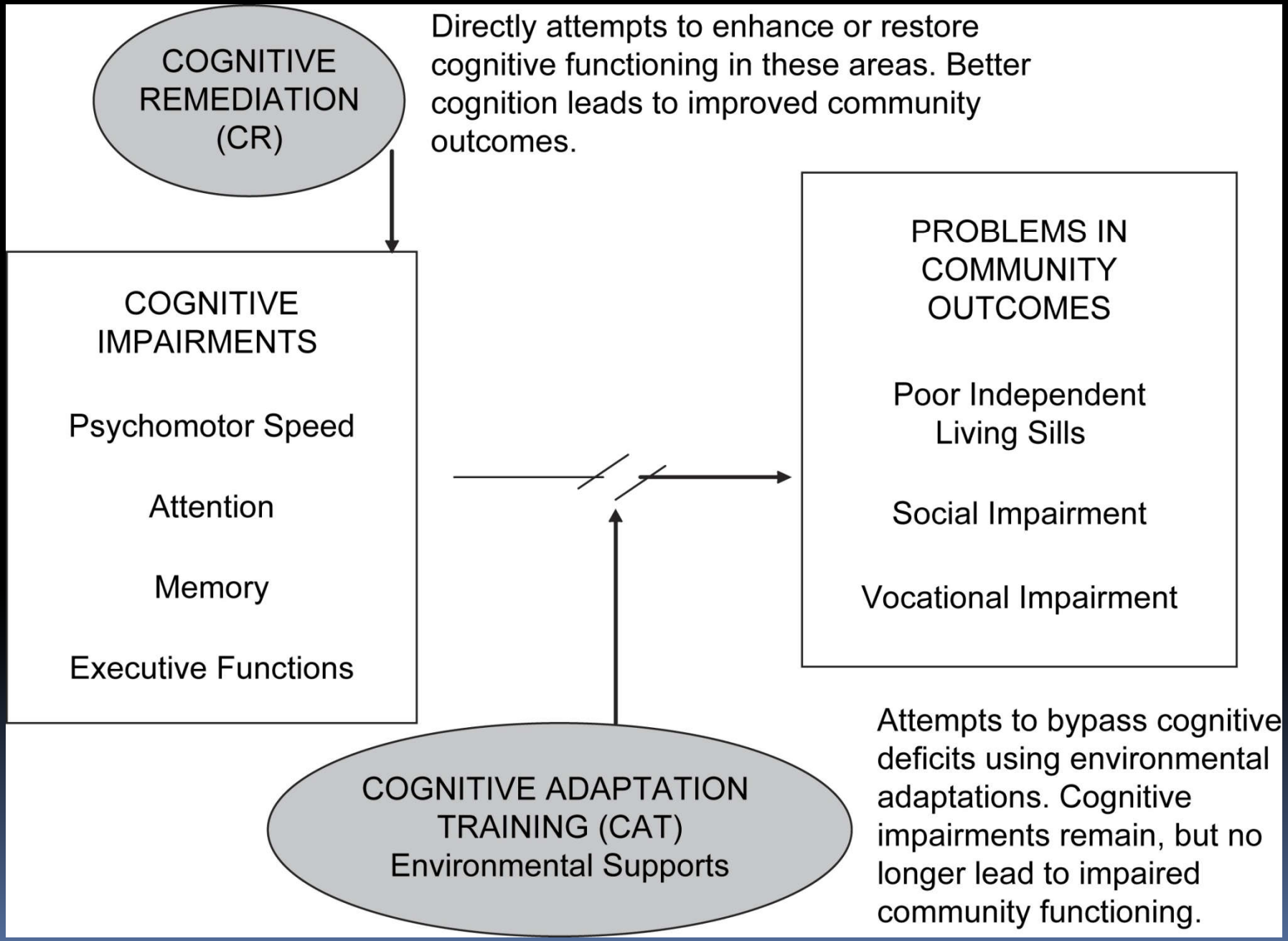
- ***Strategie di tipo compensatorio / supporti ambientali (es. CAT)***

- ***Interventi Integrati (es. INT)***



# Cognitive Adaptation Training (CAT)

- Evidence-based psycho-social intervention
- Uses a motivational strengths perspective to facilitate person's initiative and independence
- Provides environmental modifications (e.g., calendars, clocks, signs, organizers) to help people bypass cognitive challenges and organize their environment and function independently


COGNITIVE REMEDIATION (CR)
Directly attempts to enhance or restore cognitive functioning in these areas. Better cognition leads to improved community outcomes.
COGNITIVE IMPAIRMENTS
Psychomotor Speed
Attention
Memory
Executive Functions
PROBLEMS IN COMMUNITY OUTCOMES
Poor Independent Living Sills
Social Impairment
Vocational Impairment
COGNITIVE ADAPTATION TRAINING (CAT)
Environmental Supports
Attempts to bypass cognitive deficits using environmental adaptations. Cognitive impairments remain, but no longer lead to impaired community functioning.

# Adaptation: Two Mechanisms

- Assimilation:
  - Interpreting or construing environmental events in terms of one's existing cognitive structures and ways of thinking
- Accommodation:
  - Changing one's existing cognitive structures and ways of thinking to apprehend environmental events

# Psychosocial rehabilitation approach

Rehabilitation describes the restoration of functioning

Psychosocial rehabilitation refers more specifically to the restoration of psychological and social functioning, and is frequently used in the context of mental illness

King et al (2007)

Based on 2 core principles that people are:

- Motivated to achieve independence and self-confidence through competence and mastery
- Are capable of learning and adapting to meet their needs and achieve their goals

# Razionale interventi CAT

- ***Persone con disfunzione tipo apatia:***

*-Maggiore livello di strutturazione e supporti ambientali più evidenti*

- ***Persone con disfunzione tipo disinibizione:***

*-Riduzione degli stimoli e supporti ambientali più organizzati*

# Ripple Effect of Executive Functioning Skills

Weak executive functioning can cause problems in many life areas. Likewise, simple improvements can have a positive affect in many ways

# Gli effetti persistono?

## Persistence of effectiveness of cognitive remediation interventions in schizophrenia: A 1-year follow-up study

Giacomo Deste [a], Stefano Barlati [a], Paolo Cacciani [a], Luca DePeri [b], Roberto Poli [c], Emilio Sacchetti [a,b], Antonio Vita [a,b,*]

Schizophrenia Research, 2015

## Computer-assisted cognitive remediation therapy in schizophrenia: Durability of the effects and cost-utility analysis

Gemma Garrido, Rafael Penadés, Maite Barrios, Núria Aragay_, Irene Ramos, Vicenç Vallès, Carlota Faixa, Josep M. Vendrell_

Psychiatry Research, 2017

## Integrated cognitive remediation and standard rehabilitation therapy in patients of schizophrenia: persistence after 5 years

Mariachiara Buonocore [a], Marco Spangaro [a,c], Margherita Bechi [a], Maria Alice Baraldi [b], Federica Cocchi [a], Carmelo Guglielmino [a], Laura Bianchi [a], Antonella Mastromatteo [a,c], Marta Bosia [a,c,*,1], Roberto Cavallaro [a,c],

Schizophrenia Research, 2017

*Vita sempre più difficile per gli aspiranti Kamikaze: viene richiesta esperienza…*

**Schizophrenia Bulletin** vol. 35 no. 5 pp. 884–893, 2009
doi:10.1093/schbul/sbp075
Advance Access publication on July 20, 2009

# Multimodal Cognitive Therapy: Combining Treatments That Bypass Cognitive Deficits and Deal With Reasoning and Appraisal Biases

**Dawn I. Velligan[1,2], Meredith Draper[2], Donna Stutes[2], Natalie Maples[2], Jim Mintz[2], Sara Tai[3], and Douglas Turkington[4]**

[2]Department of Psychiatry, The University of Texas Health Science Center San Antonio, San Antonio, TX; [3]School of Psychological Sciences, University of Manchester, Manchester, UK; [4]School of Neurology, Neurobiology and Psychiatry, Newcastle University, Newcastle upon Tyne, UK

**The process of recovery in schizophrenia involves resolving persistent symptoms, addressing cognitive impairments, and improving functional outcomes. Our research group has demonstrated the efficacy of cognitive adaptation training (CAT)—a home-based psychosocial treatment utilizing environmental supports such as medication containers, signs, checklists, and the organization of belongings to bypass deficits in cognitive functioning and cue and sequence adaptive behavior) for improving adherence to medications and functional outcomes in schizophrenia. Early CAT pilot studies utilizing some therapists with training in cognitive behavior therapy (CBT) techniques for psychosis found significant improvements in positive symptoms. More recent larger scale randomized clinical trials failed to replicate this finding with CAT therapists not trained in CBT techniques. Persistent psychotic symptoms substantially impair patients' ability to adapt to life in the community. Cognitive**

**nation into a multimodal treatment, and describe the design of an ongoing randomized trial to investigate efficacy.**



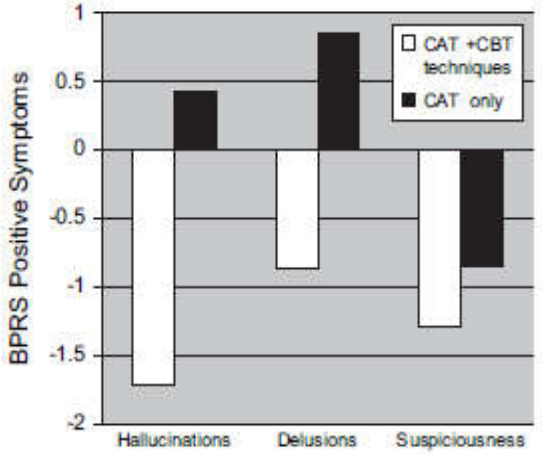



**Fig. 3.** Changes in Psychosis Symptoms Over Time in Cognitive Adaptive Training (CAT) Alone Vs CAT Conducted by Individuals With Cognitive Behavior Therapy Training. In mixed effects regression analyses with baseline scores used as covariates, differences between groups on levels of hallucinations and delusions were significant after 9 months of treatment ($F_{1,11} = 7.88$, $P < .01$ and $F_{1,11} = 6.10$, $P < .04$); while differences on level of suspiciousness

**Schizophrenia Bulletin** vol. 34 no. 3 pp. 483–493, 2008
doi:10.1093/schbul/sbm111
Advance Access publication on October 10, 2007

# The Use of Individually Tailored Environmental Supports to Improve Medication Adherence and Outcomes in Schizophrenia

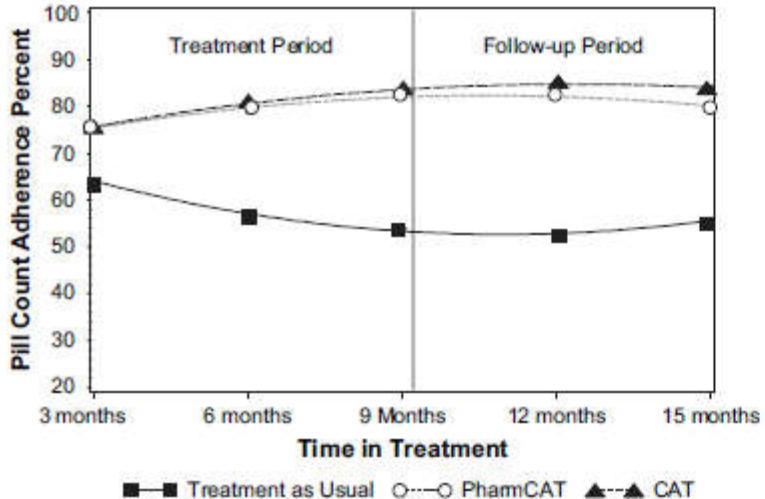
**Dawn I. Velligan[1,2], Pamela M. Diamond[5], Jim Mintz[2], Natalie Maples[2], Xueying Li[2], John Zeber[2,6], Larry Ereshefsky[3], Yui-Wing F. Lam[4], Desiree Castillo[2], and Alexander L. Miller[2]**

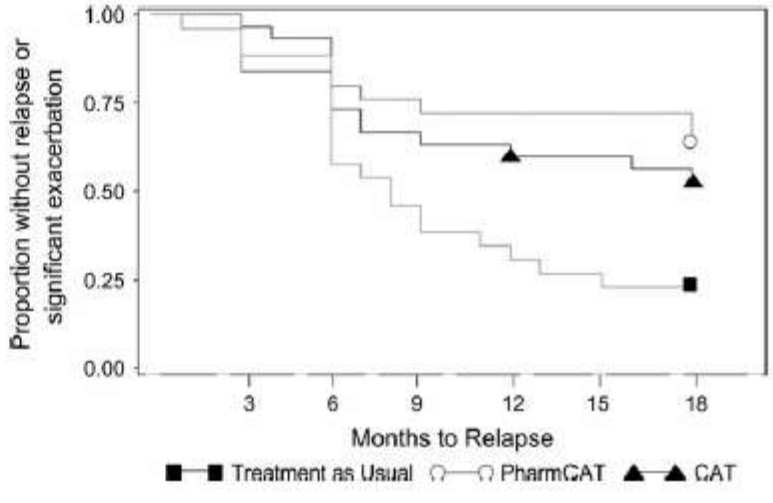
[2]Department of Psychiatry; [3]Department of Pharmacotherapy Education and Research; [4]Department of Pharmacology, University of Texas Health Science Center at San Antonio, San Antonio, TX; [5]Center for Health Promotion and Prevention Research, University of Texas School of Public Health, Houston, TX; [6]VERDICT, Veterans Affairs HSR&D, San Antonio, TX

**TAU (.004). Findings indicate that supports targeting medication adherence can improve and maintain this behavior. Comprehensive supports targeting multiple domains of functioning are necessary to improve functional outcomes. Maintenance of gains in functional outcome may require some form of continued intervention.**

*Key words:* medication adherence/cognitive deficits/cognitive rehabilitation/medication compliance/cognitive adaptation training/environmental supports





**Schizophrenia Bulletin** vol. 41 no. 3 pp. 597–603, 2015
doi:10.1093/schbul/sbu127
Advance Access publication September 5, 2014

# A Randomized Controlled Trial Comparing Cognitive Behavior Therapy, Cognitive Adaptation Training, Their Combination and Treatment as Usual in Chronic Schizophrenia

**Dawn I. Velligan*[,1], Sara Tai[2], David L. Roberts[1], Natalie Maples-Aguilar[1], Matt Brown[1], Jim Mintz[1], and Douglas Turkington[3]**

[1]Department of Psychiatry, University of Texas Health Science Center, San Antonio, San Antonio, TX; [2]School of Psychological Sciences, University of Manchester, Manchester, UK; [3]School of Neurology, Neurobiology and Psychiatry, Newcastle University, Newcastle upon Tyne, UK

*To whom correspondence should be addressed; Department of Psychiatry, The University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78229-3900, US; tel: 210-567-5508, fax: 210-567-1291, e-mail: velligand@uthscsa.edu

**Following baseline assessment, 166 patients in medication maintenance at a community mental health center who were experiencing both persistent positive symptoms of schizophrenia and impairments in functioning were randomized to 1 of 4 treatments for 9 months: (1) Cognitive Behavior Therapy for psychosis (CBTp)—a therapy designed to identify and alter reasoning and appraisal biases that contribute to the formation and maintenance of positive symptoms, (2) Cognitive Adaptation Training (CAT)—a treatment using environmental supports including signs, alarms, checklists and the organization of belongings established at weekly home visits to compensate for impairments in cognitive functioning and improve everyday functional outcomes, (3) Multi-modal Cognitive treatment—a combination of CBTp and CAT, and (4) Treatment as Usual. Data on symptoms and functional outcomes were obtained every 3 months. A mixed effects regression model with repeated measures using a 2 (CAT/no CAT) × 2 (CBT/no CBT) design indicated that functioning as measured by the Multnomah Community Ability Scale improved more in groups receiving CAT than other treatment groups. Auditory hallucinations and associated distress improved slightly more in groups receiving CAT. In this study, CBTp did not improve outcomes. Combining CAT with CBTp did not improve outcomes more than CAT alone.**

talk-therapy designed to help the individual to identify appraisal biases, cognitive distortions, and alternative explanations for events, and to find ways to cope with the distress caused by persistent psychotic symptoms. Cognitive Adaptation Training (CAT) is home-based therapy using environmental supports, such as signs, checklists, alarm reminders, and the organization of belongings to bypass cognitive and motivational impairments and improve everyday functioning. We were interested in determining whether a multimodal intervention combining these therapies would improve a broader range of outcomes for individuals with schizophrenia than either single modality treatment.

Both CBTp and CAT attempt to deal with cognitive problems in different ways. CAT uses supports in the environment to bypass formal neurocognitive deficits and cue and sequence functional behaviors.[1] CBTp seeks to identify and alter emotional processes and behaviors associated with reasoning and appraisal biases that contribute to the formation and maintenance of positive symptoms and functional problems.[2] The integration of treatment primarily aimed at reducing positive symptoms with another designed to cue behavior in the home is a novel multimodal approach we have called Mcog.[3]

Both CBTp and CAT are designed to customize treatments to the needs of the individual. CBTp accomplishes this by developing an individual problem list collabora-

Stiekema et al. Trials (2015) 16:49
DOI 10.1186/s13063-015-0566-8

TRIALS

STUDY PROTOCOL Open Access

# Effectiveness and cost-effectiveness of cognitive adaptation training as a nursing intervention in long-term residential patients with severe mental illness: study protocol for a randomized controlled trial

Annemarie PM Stiekema[1,2*], Piotr J Quee[3], Marian Dethmers[1], Edwin R van den Heuvel[4], Jeroen E Redmeijer[1], Kees Rietberg[1], A Dennis Stant[4], Marte Swart[5], Jaap van Weeghel[6], André Aleman[7,8], Dawn I Velligan[9], Robert A Schoevers[2,10], Richard Bruggeman[2,10] and Lisette van der Meer[1,2,7]

**Abstract**

**Background:** Despite the well-known importance of cognitive deficits for everyday functioning in patients with severe mental illness (SMI), evidence-based interventions directed at these problems are especially scarce for SMI patients in long-term clinical facilities. Cognitive adaptation Training (CAT) is a compensatory approach that aims at creating new routines in patients' living environments through the use of environmental supports. Previous studies on CAT showed that CAT is effective in improving everyday functioning in outpatients with schizophrenia. The aim of this study is to evaluate the effect of CAT as a nursing intervention in SMI patients who reside in long-term clinical facilities.

**Methods/Design:** This is a multicenter cluster randomized controlled trial comparing CAT (intervention group) as a nursing intervention to treatment as usual (control group). The primary goal is to evaluate the effectiveness of CAT on everyday functioning. Secondary outcomes are quality of life, empowerment and apathy. Further, an economic evaluation will be performed. The study has a duration of one year, with four follow-up assessments at 15, 18, 21 and 24 months for the intervention group.

**Discussion:** There is a need for evidence-based interventions that contribute to the improvement of the functional recovery of long-term residential patients. If our hypotheses are confirmed, it may be recommended to include CAT in the guidelines for SMI care and to implement the method in standardized care.

**Trial registration:** Nederlands Trial Register (identifier: NTR3308). Date registered: 12 February 2012.

**Keywords:** Cognitive adaptation training, CAT, Functioning, Severe mental illness, Schizophrenia, Quality of life, Nursing intervention, Cognitive remediation

*Recuperato nel padiglione delle Filippine il giapponese che non sapeva della fine dell'EXPO…*

PERÒ DAI,
LE COSE SBAGLIATE
MI VENGONO TUTTE
GIUSTE.

*Grazie per l'attenzione*