

# DEFICIT DELLE FUNZIONI ESECUTIVE E... CAT



*Dario Lamonaca CSM Aulss 9 Scaligera, Legnago VR*



# Dimensions Altered in Individuals with Schizophrenia

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



Susan Gingerich - Kim Mueser

## Illness Management and Recovery

Programma di gestione della malattia

Edizione italiana  
a cura di

Ileana Boggian  
Bruna Mattioli  
Silvia Morlin  
Giovanni Soro

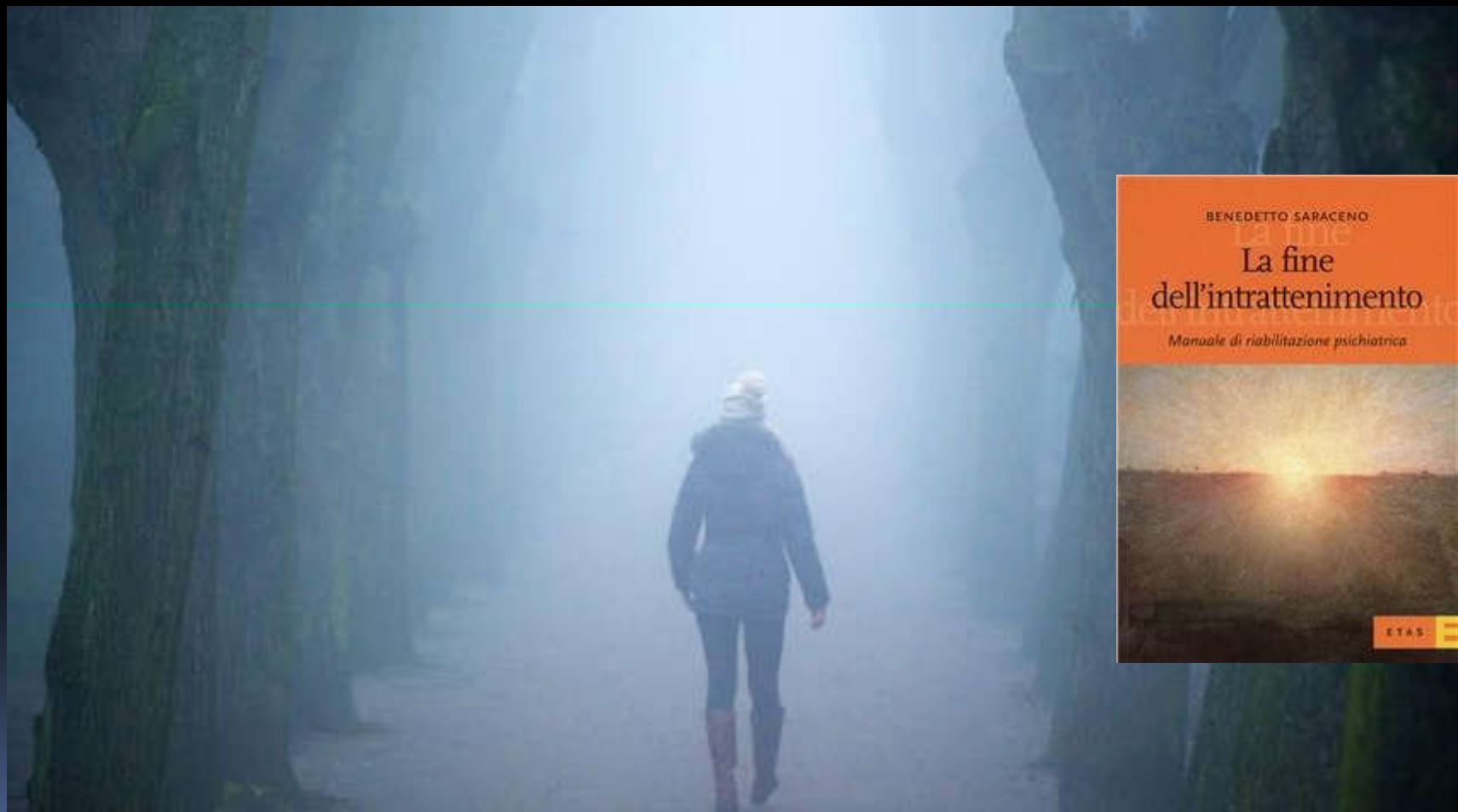
Prefazione di

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Società Italiana  
di Riabilitazione Psicosociale



*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

# Limitations of biological treatments

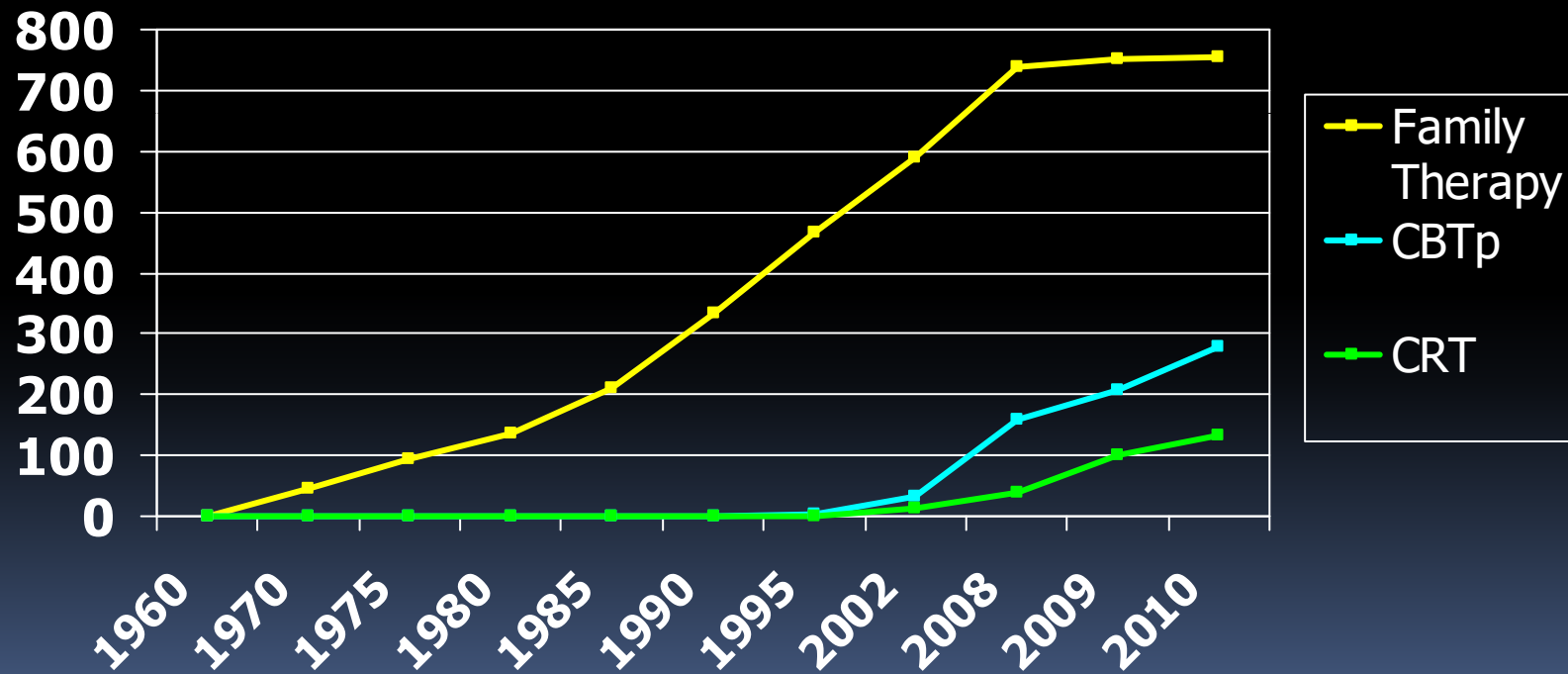
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- 10-30% fail to remit by 12 months (Emsley et al. 2007)
- Up to 40% may only partially recover
- The problem of relapse
- Adherence rates (Lieberman et al., 2005; Meltzer 2006)
- Side-effects
- Secondary morbidity and co-morbidity
- Unemployment and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



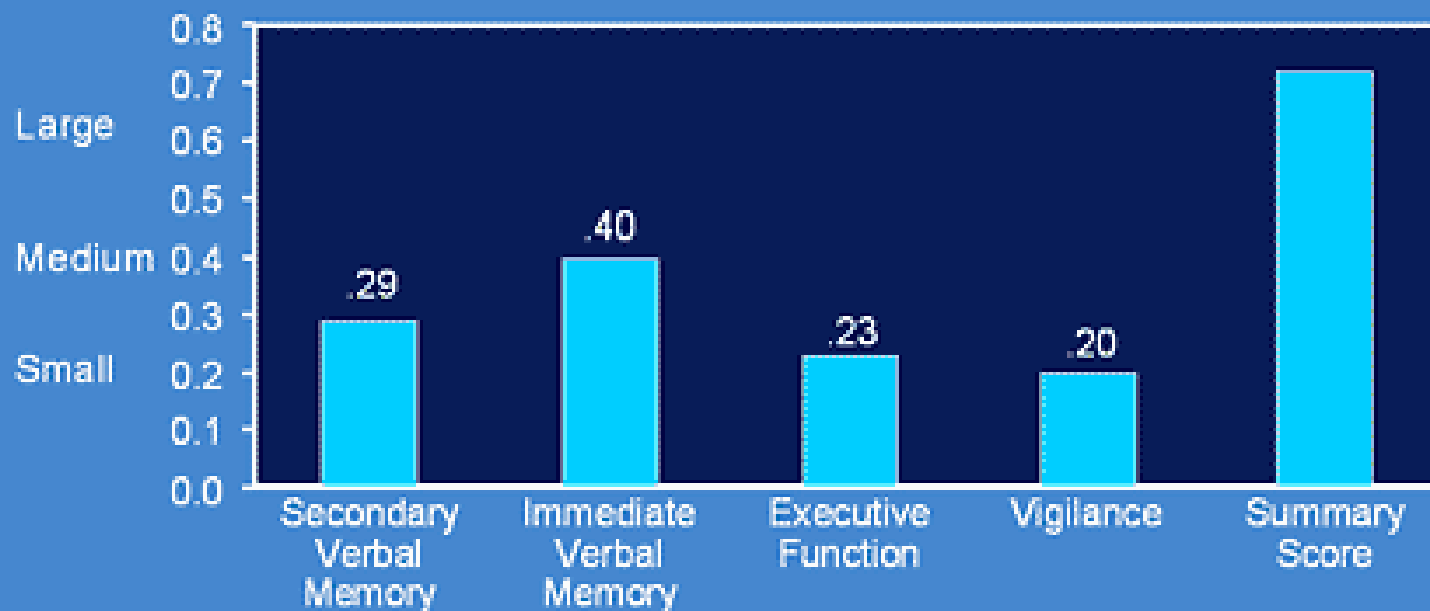
# Rate of accumulation of information on therapies

Cumulative information on psychological therapies



# Cognitive Deficits and Functional Outcome

Pooled estimated  $r^*$  *Effect Sizes (Cohen's  $r$ )*



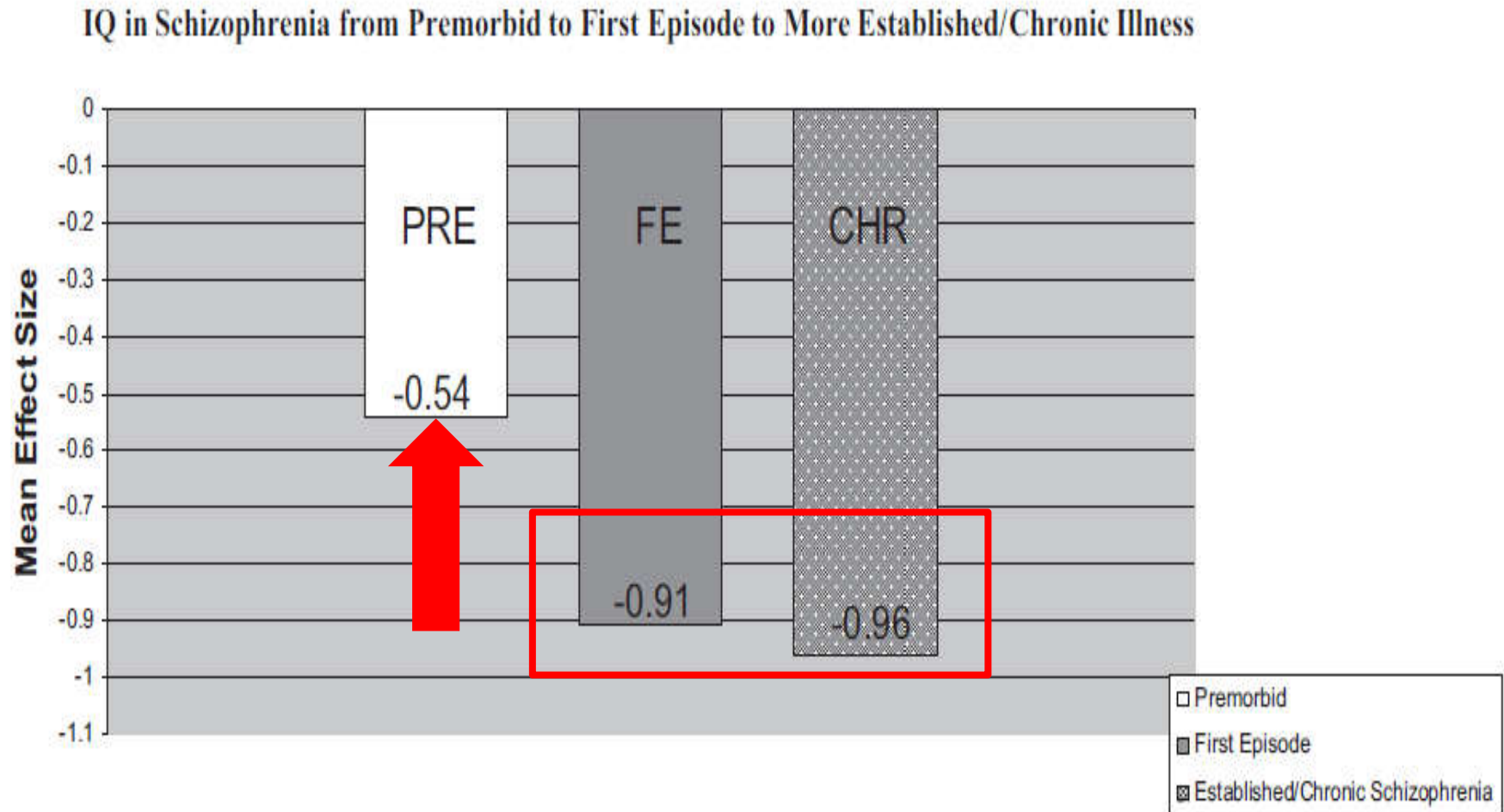
\* Estimates weighted by sample size.  
Results from 4 separate metaanalyses.  
Green MF et al. *Schizophr Bull.* 2000;26:119-136.



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

Test or construct	Effect Size	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

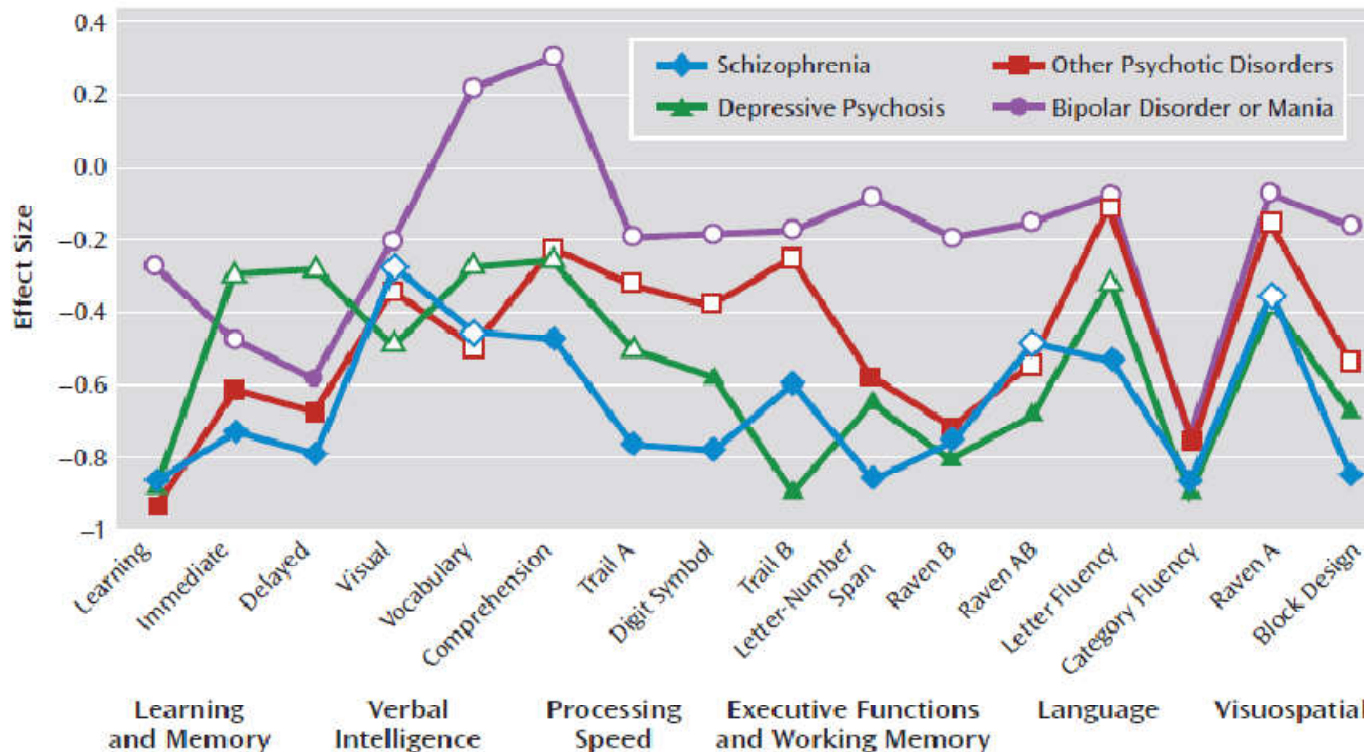
# Neurocognition in First-Episode Schizophrenia: A Meta-Analytic Review



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

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

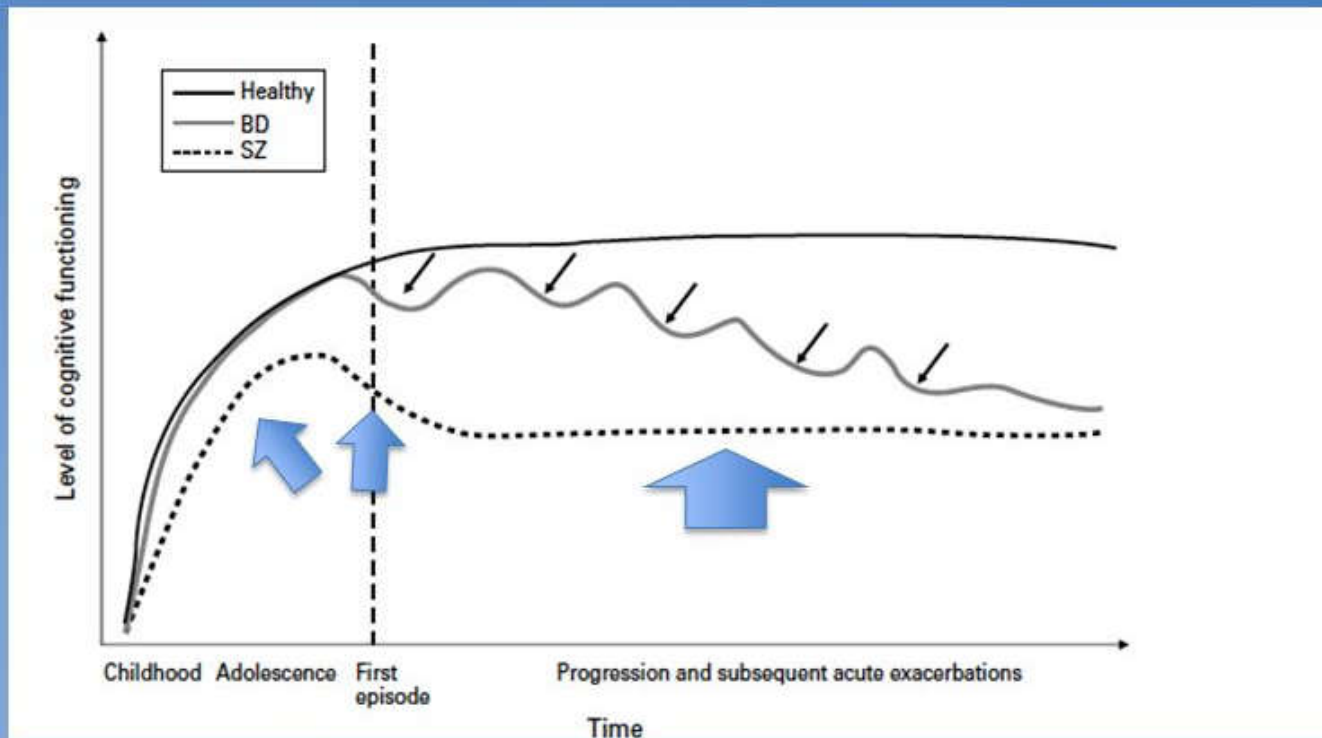
FIGURE 2. Neuropsychological Performance Among Patients With Various First-Episode Psychosis Presentations<sup>a</sup>



<sup>a</sup>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.

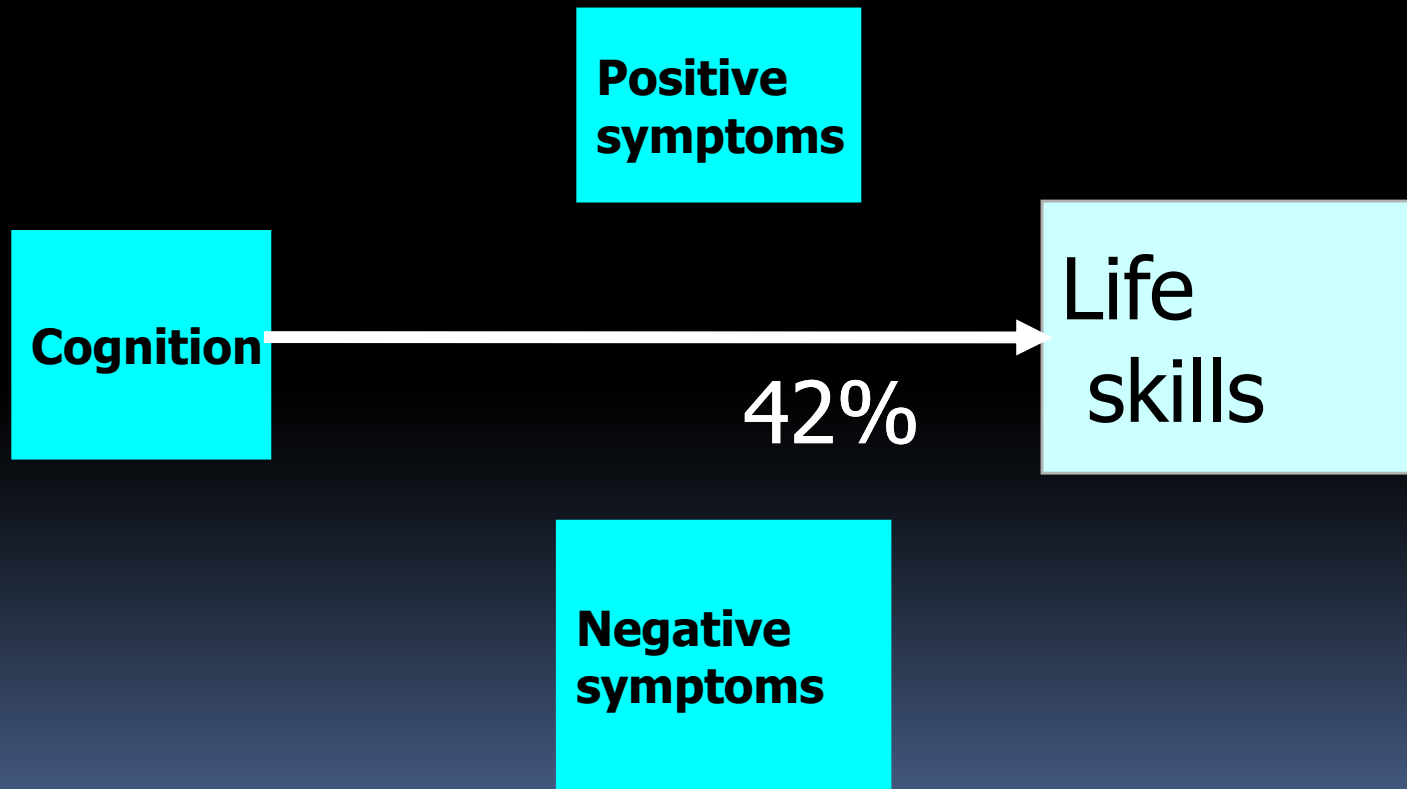
# Trajectory of Cognitive Deficits

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

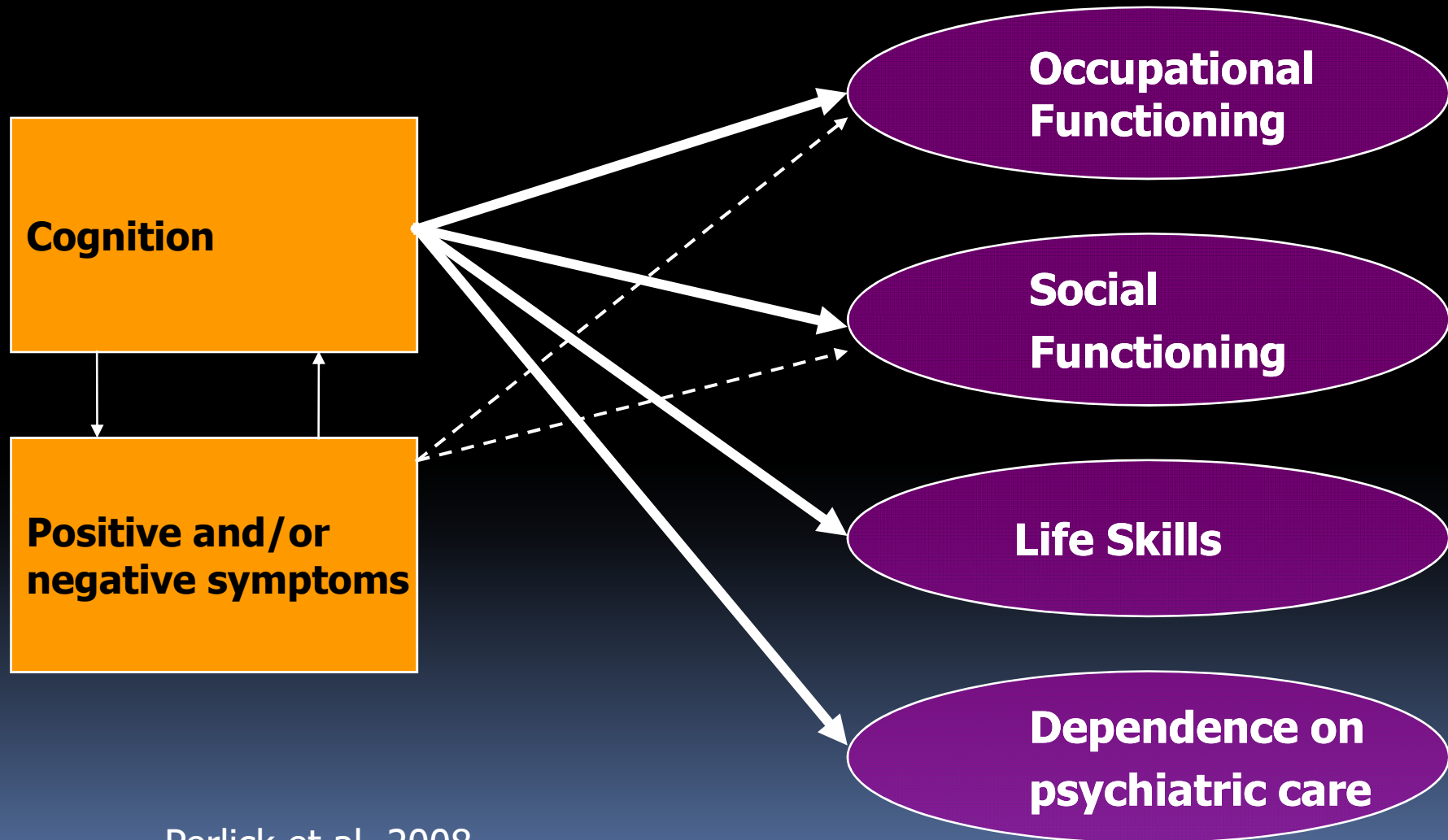


# Life Skills

*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)



# DEFICIT COGNITIVI NELLA SCHIZOFRENIA ED ESITI DISFUNZIONALI

## Funzioni cognitive

**Attenzione**

**Memoria**

**Funzioni Esecutive**

**Linguaggio**

**Metarappresentazione**

## deficit cognitivi

Deficit nella capacità di selezionare gli stimoli rilevanti ed irrilevanti

Deficit nell'accesso all'informazione già immagazzinata e della "Consapevolezza di Conoscenza"

Deficit nell'elaborazione dell'informazione, nell'organizzazione e nella pianificazione di azioni finalizzate

Alogia, deficit di simbolizzazione e di comprensione verbale

Incapacità di comprendere il contesto, anomalie pragmatiche della comunicazione

## Esiti disfunzionali

**Gestione personale.  
Competenze sociali.  
Social Problem Solving**

Abitare, nutrirsi, vestirsi

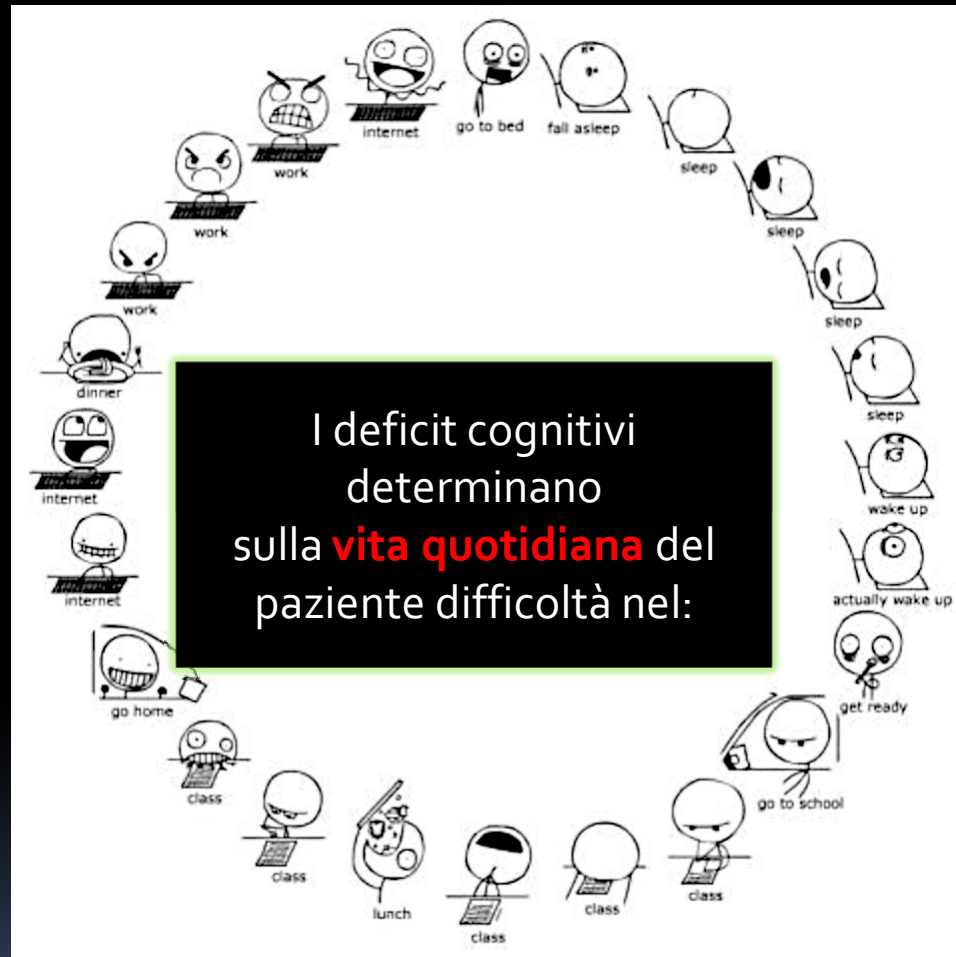
Mezzi di trasporto;  
Gestione del denaro

Cura della salute fisica;  
Corretta compliance

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

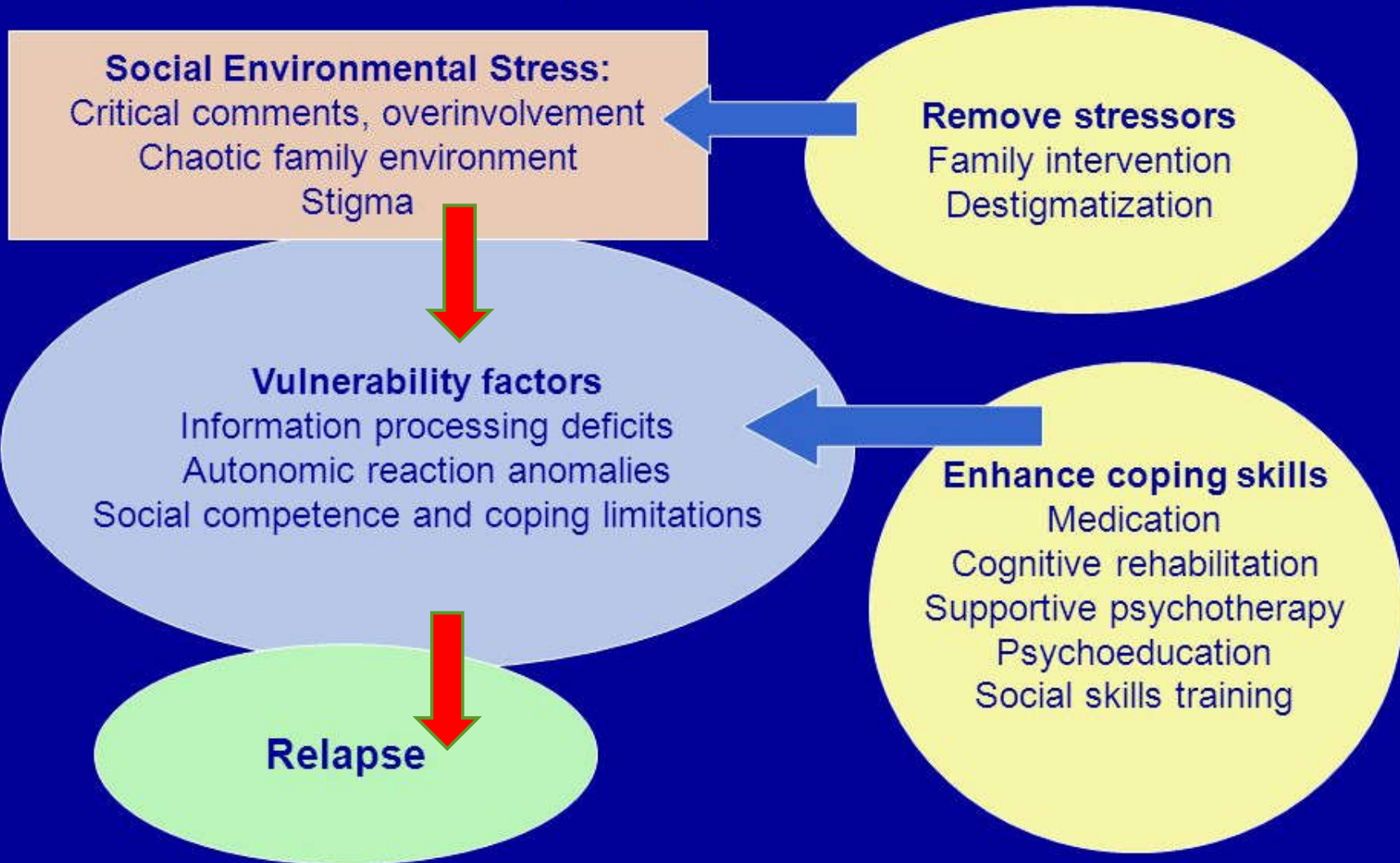
Risoluzione di  
situazioni  
problematiche

Espressione di  
concetti

Prendere decisioni

Svolgimento di un  
compito e sua  
portata a termine

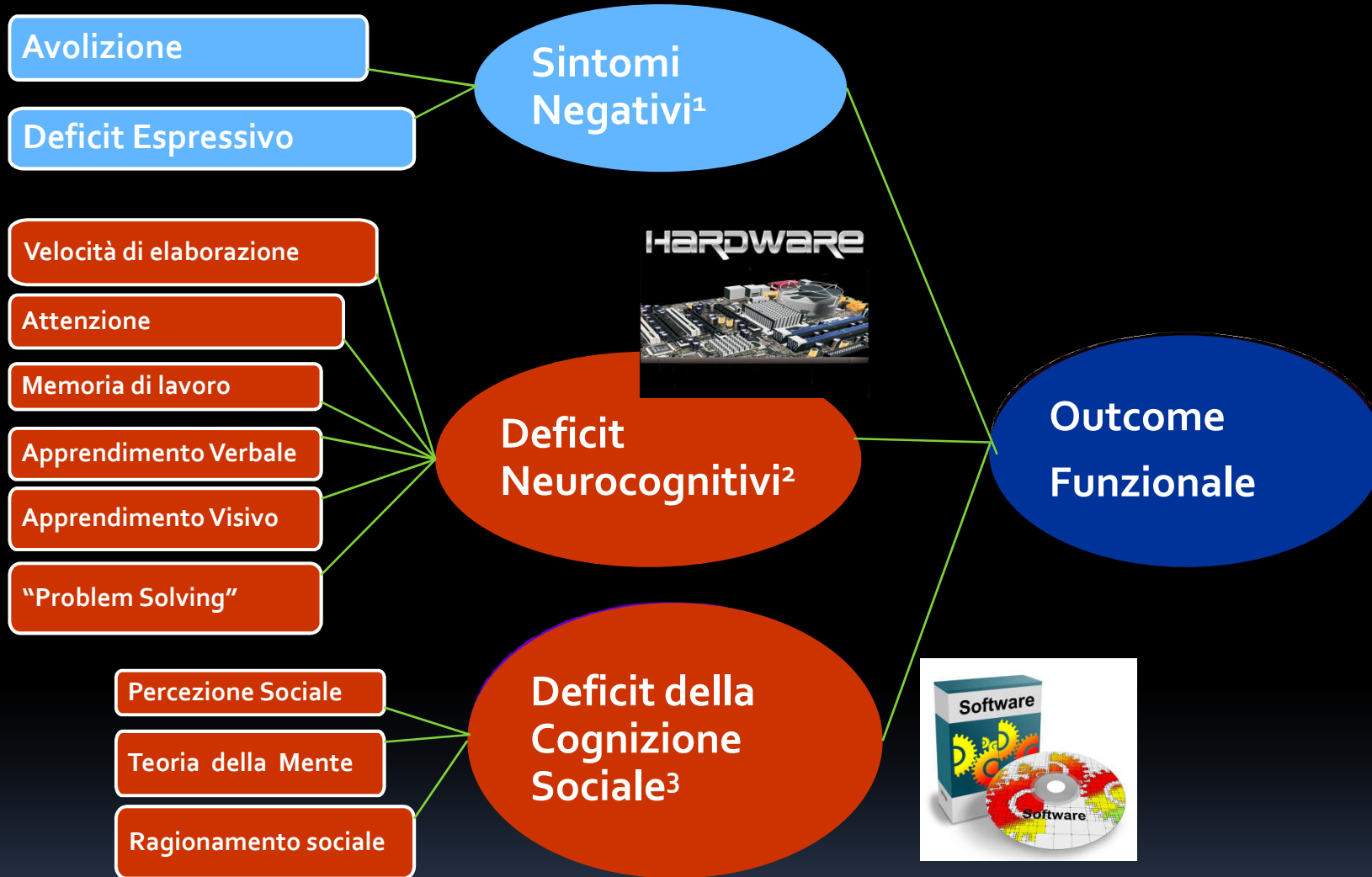
# Relapse prevention



# **Cognition and Functional Outcome in Schizophrenia**

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- **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**



<sup>1</sup>Addington et al. Can J Psychiatry 2003; <sup>1</sup>Harvey & Strassnig World Psychiatry 2013; <sup>1</sup>Galderisi et al, Schizophr Res 2013; <sup>1</sup> Mucci et al Eur Psychiatry; <sup>1,2,3</sup>Galderisi et al, World Psychiatry; <sup>2</sup>Dickerson F, et al. Schizophr Res 1999; <sup>2</sup>Green MF, et al. Schizophr Bull 2000; <sup>3</sup>Couture et al. Schizophr Bull 2006; <sup>3</sup>Green et al, Arch Gen Psychiatry 2012; <sup>3</sup>Harvey & Strassnig World Psychiatry 2013; <sup>3</sup>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...*

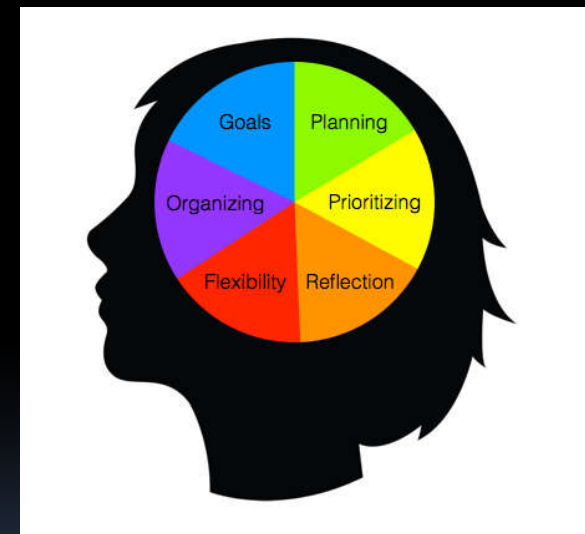
- *Sulla capacità di compiere funzioni mentali complesse come ad es. formarsi un'opinione*
- *Sull'emotività*
- *Sul comportamento manifesto*
- *Sulle abilità di coordinare pensieri ed idee con i processi percettivi e di adattare l'organizzazione interna delle informazioni alle richieste dell'ambiente*





# *Le funzioni esecutive*

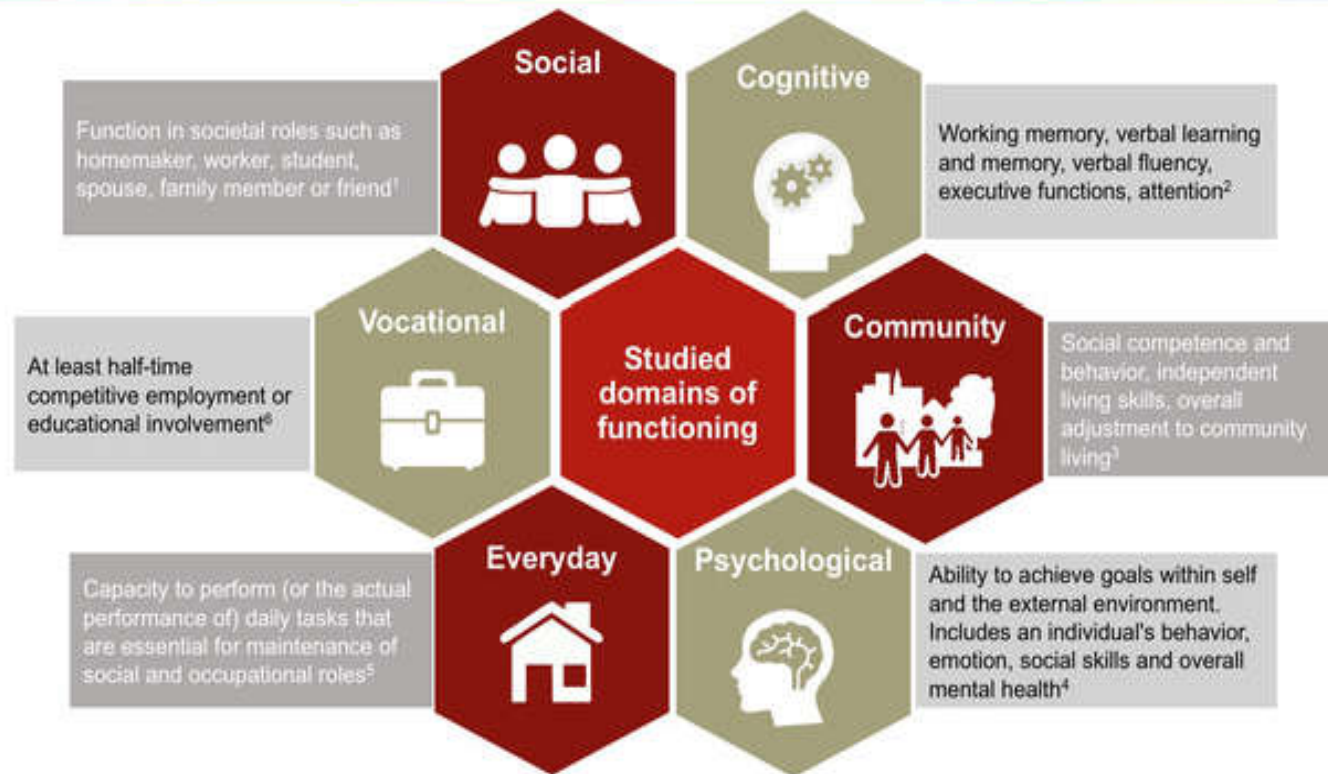
- *Le funzioni esecutive sono un'insieme di abilità cognitive che controllano e regolano la maggior parte di ciò che facciamo nella vita quotidiana*
- *Includono le abilità di iniziare, pianificare e organizzare, scegliere gli obiettivi, risolvere problemi, regolare le emozioni e monitorare il comportamento*



# 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

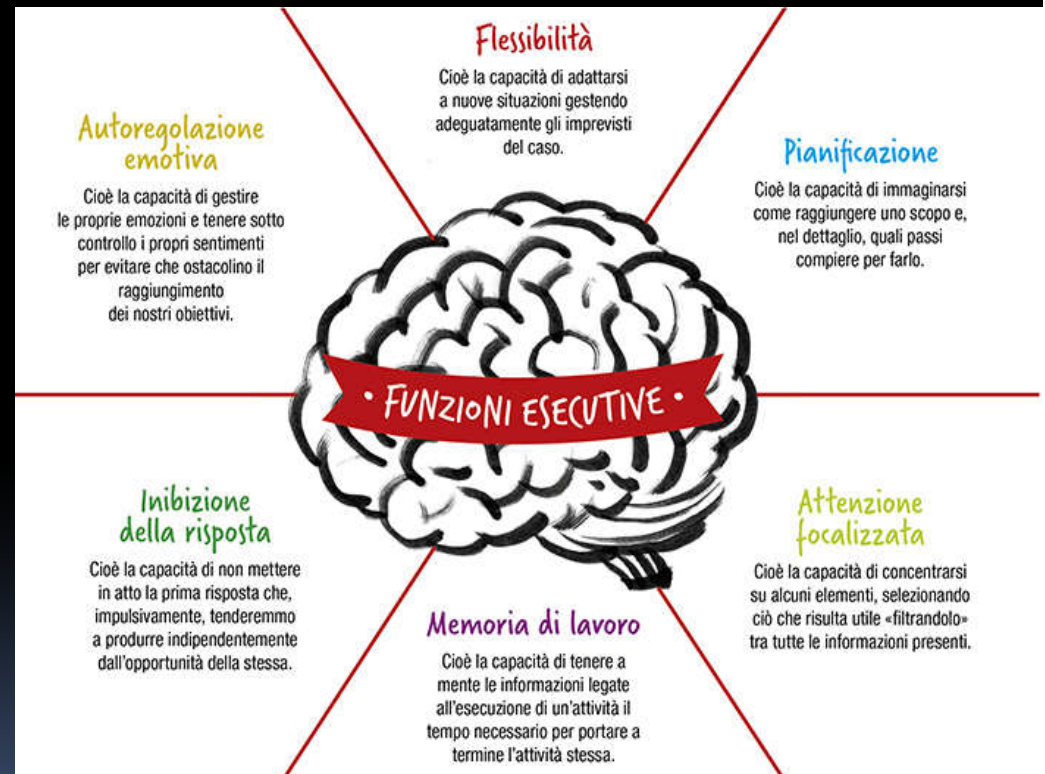
# Functioning is complex and multifactorial



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.

# 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

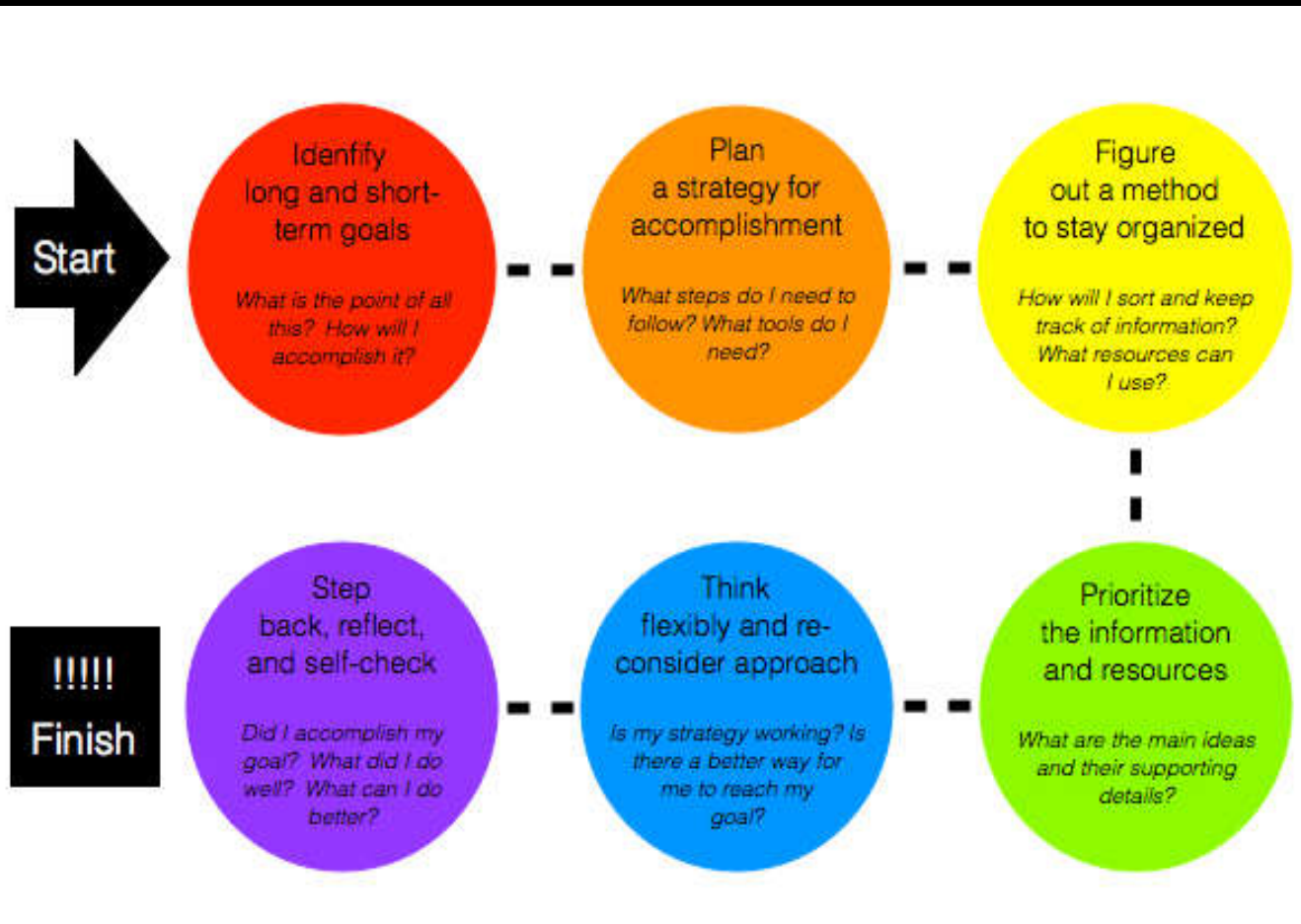
## COMPORAMENTI

- 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



## Manipulating the environment: executive function

- sustain or appropriately switch attention
- inhibition of responses/impulses
- planning strategies of behaviour
- initiation of strategies
- error correction
- switching strategies
- working memory
- coordination – thinking!

concentration

resisting temptation

delayed gratification

self-directed  
learning

interdependent  
learning

problem solving

creativity

innovation



# Il direttore d'orchestra...

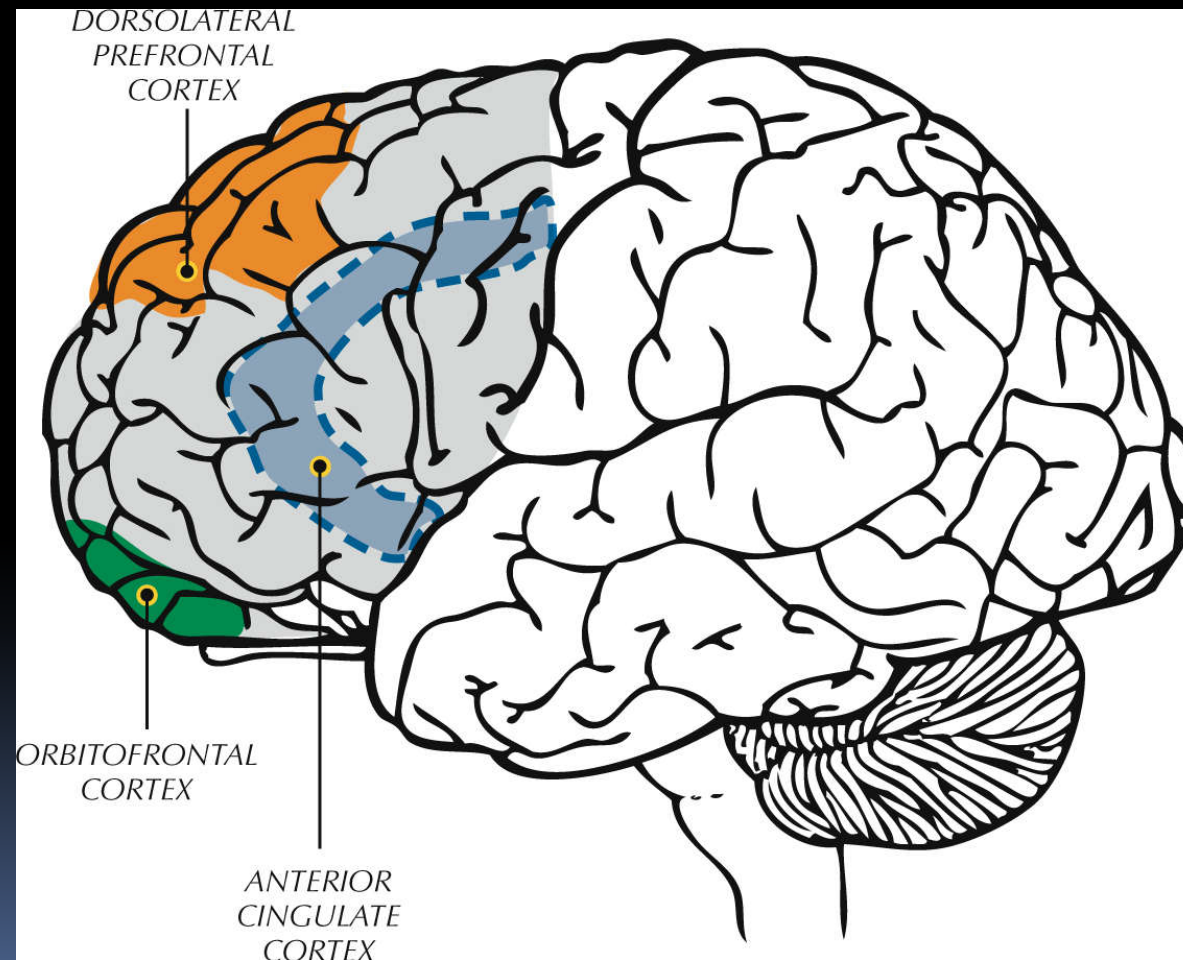
***"I deficit cognitivi nella schizofrenia sono come un'orchestra senza direttore..."***

*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 ?*



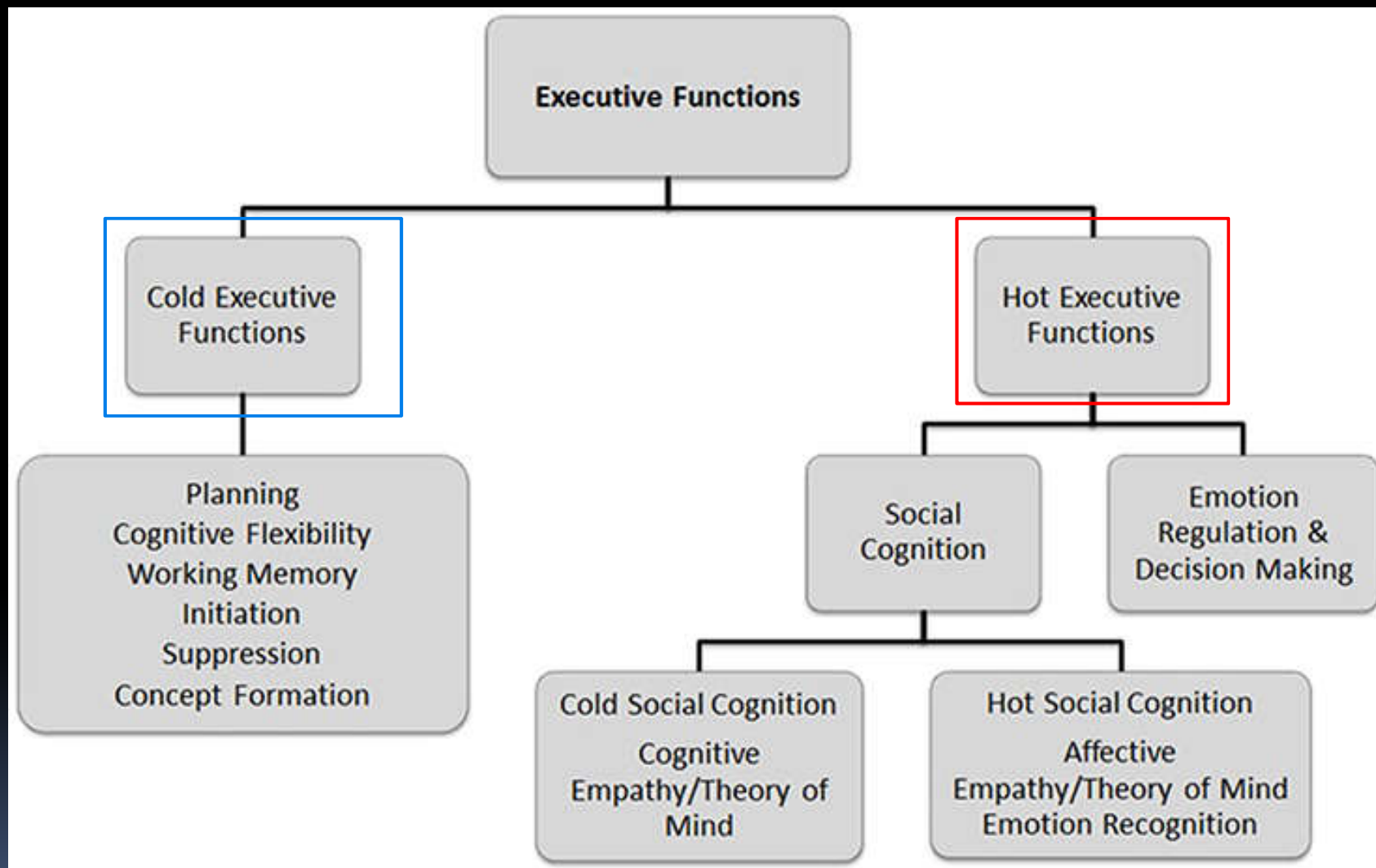


Fotografata in Brasile

Inviata da Antonio



**bastarddentro**



## Thinking

Prioritizing / Time Management

Organization

Working Memory

Metacognition / Reflection

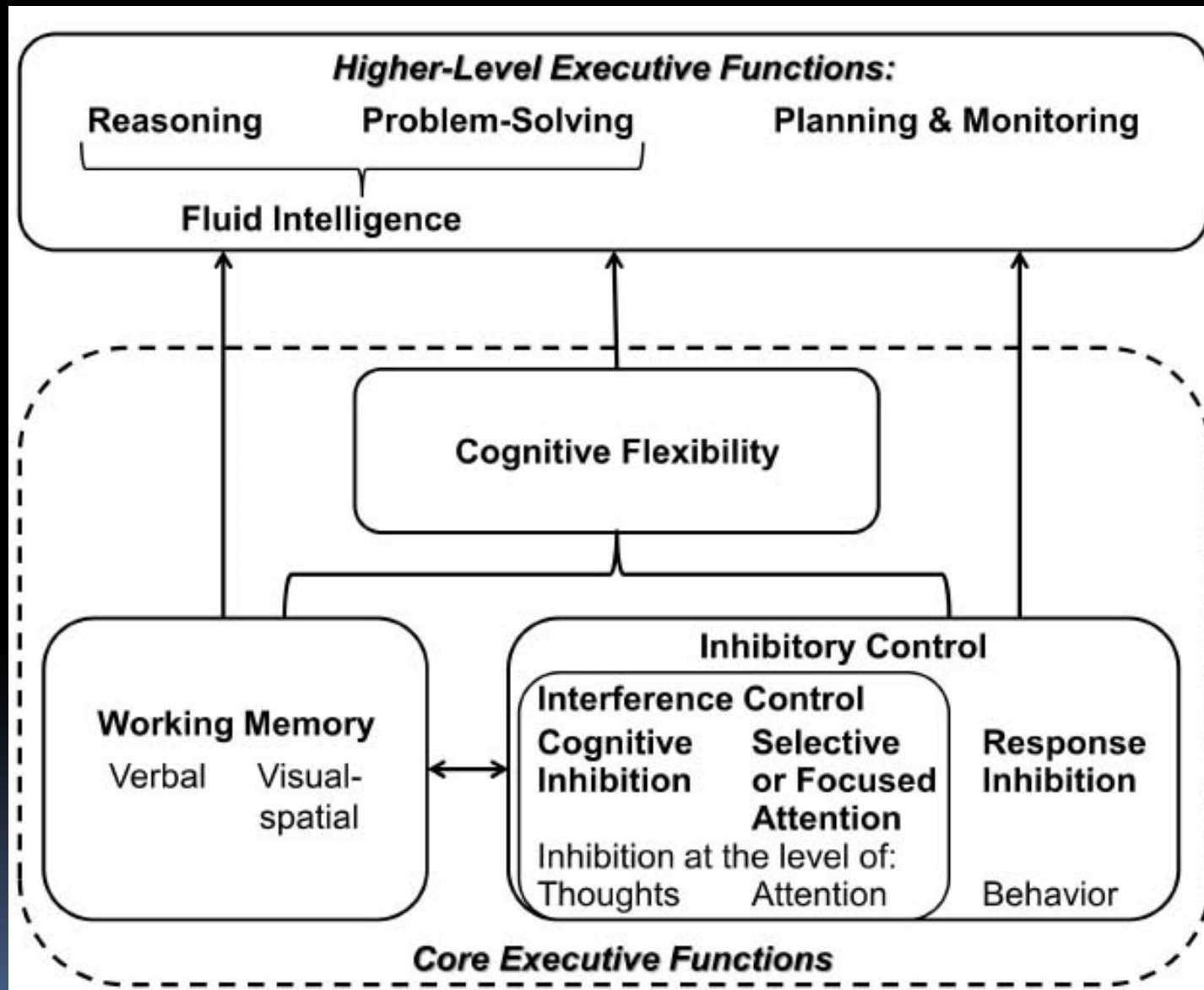
## Self-Regulation

Task Initiation

Flexibility

Behavioral Control

Self-Monitoring



# 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

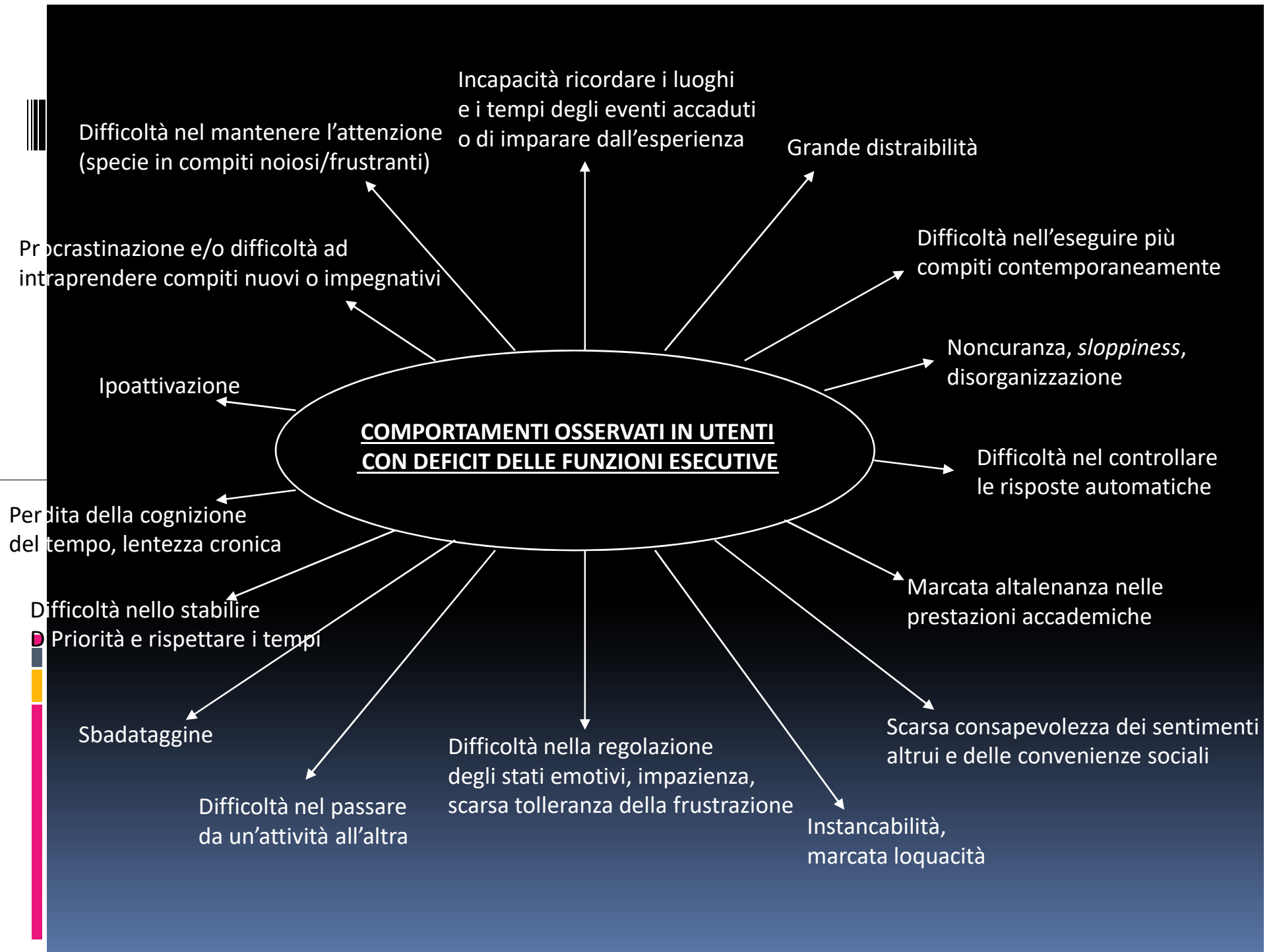




# Executive Functioning Deficits

- 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





# 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*



**SESSO**

LO STAI FACENDO NEL MODO SBAGLIATO?

# *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...**



TI AND



CARZI TUOI



DOW

# 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 cognitivà 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 riferisce alla produzione di nuovi neuroni, si verifica anche nell'adulto (Eriksson 1998; Eriksson e Persson 1999)

### Neurogenesi indotta da nuove connessioni

stimoli, esercizio, (Gould 2000)

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

La capacità dei neuroni di formare nuove connessioni, modificando la forza delle sinapsi esistenti, la citoarchitettura, la capacità di rispondere a stimoli

**Il cervello non è "fisso", ma si modifica continuamente contro ad un continuo rimodellamento morfologico**

## Approccio riabilitativo ai disturbi neuropsicologici



### 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

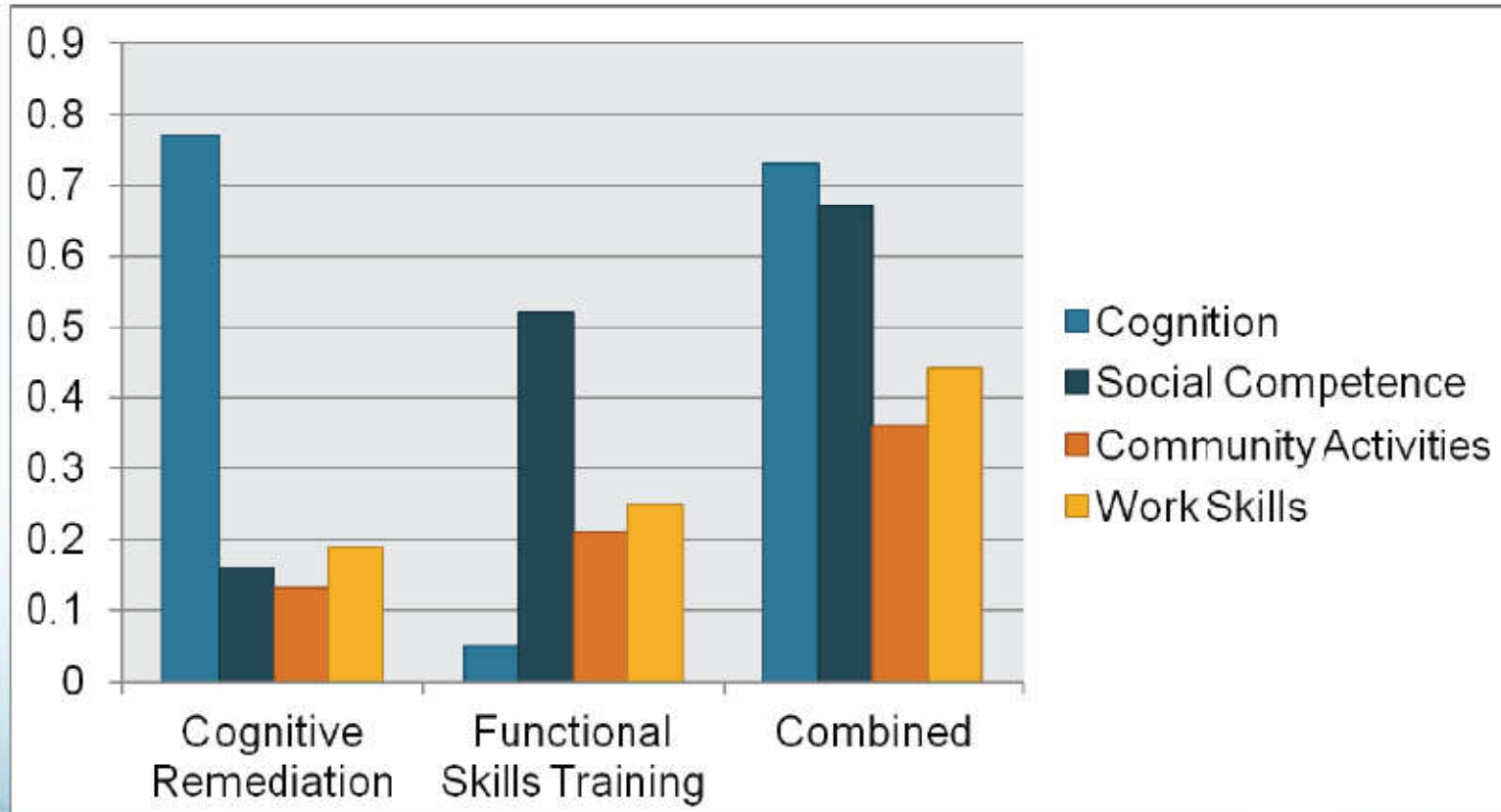


- I livelli di BDNF (fattore neurotrofico cerebrale) aumentano dopo training cognitivo. BDNF proposto biomarker periferico degli effetti del training (Vinogradov et al., 2009)
- Brain Imaging (fMRI e DTI):
  - Incremento attivazione nei lobi frontali
    - a) Regioni associate alla working memory (Wykes 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 cognitivà e funzionamento
- effetti sui sintomi modesti e non duraturi
- non grandi differenze tra diversi tipi di approccio (approcci “strategici” piú efficaci)
- piú efficaci nei pazienti clinicamente stabili
- piú efficaci sul funzionamento se applicati in aggiunta a riabilitazione

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



*Combined Cognitive Remediation and Functional Skills Training for Schizophrenia: Effects on Cognition, Functional Competence and Real-World Behavior, Am J 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...*



ELSEVIER

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## Schizophrenia Research

journal homepage: [www.elsevier.com/locate/schres](http://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<sup>a,b,\*</sup>, Giacomo Deste<sup>a</sup>, Stefano Barlati<sup>a</sup>, Antonino Grano<sup>b</sup>, Roberto Poli<sup>c</sup>, Emilio Sacchetti<sup>a,b</sup>

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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)*

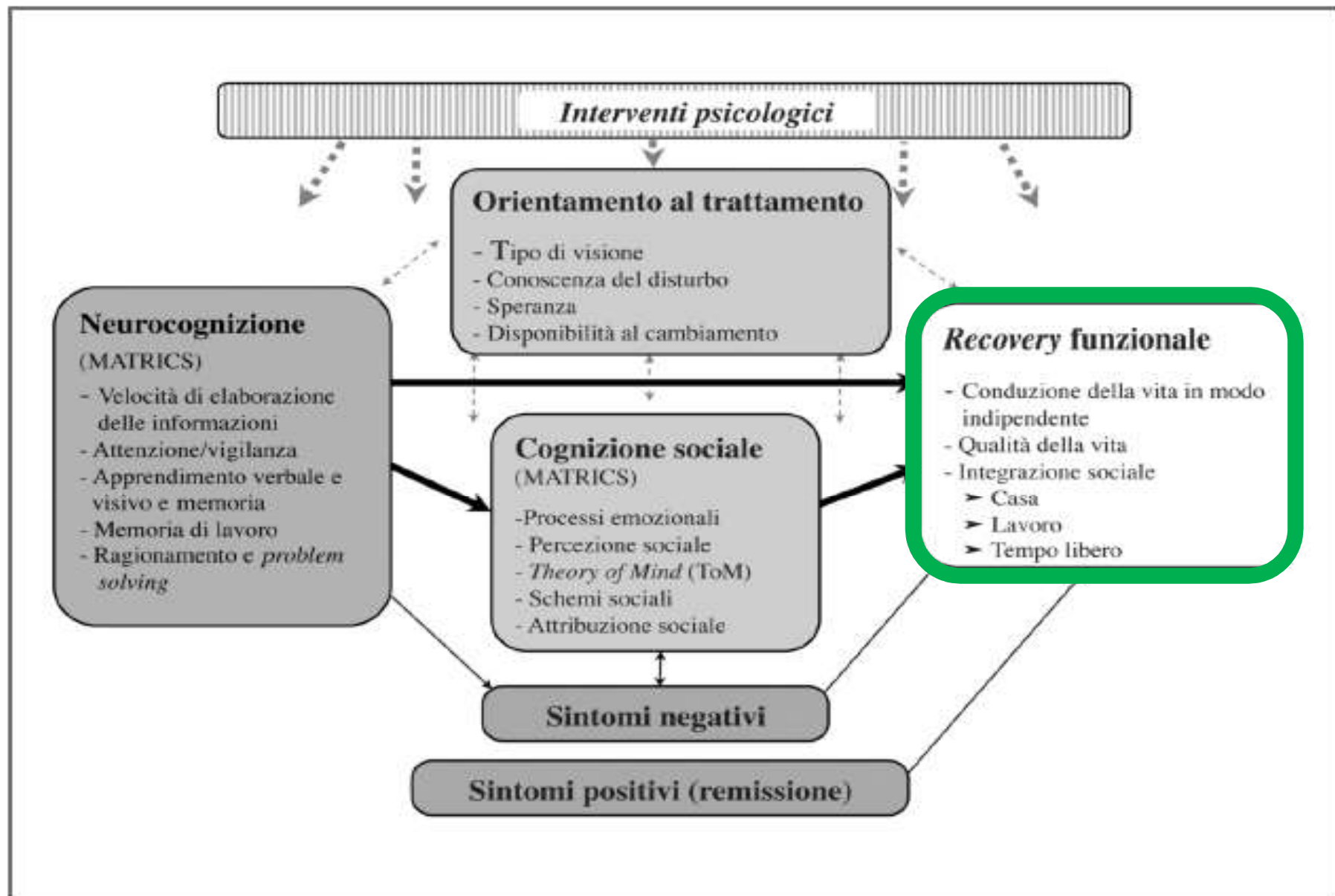


Fig. 1.1 Modello integrato: possibili mediatori tra la cognitiv  e il recovery funzionale (Roder et al., 2010)

# *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*

# *Rimedio cognitivo*

## *Training neurocognitivo*

### **Strategie**

Compensatorie

*Supporti ambientali*

Riparative

### **Approcci**

*“top-down”  
insegnare  
strategie*

*“bottom-up”  
semplificare  
e praticare*

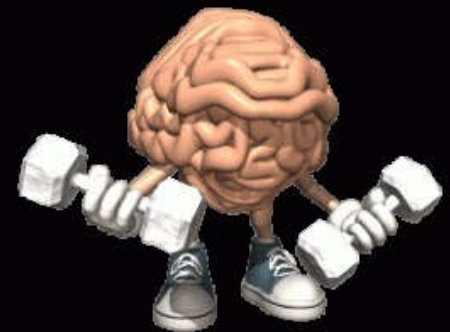
### **Formato**

Gruppo

Individuale

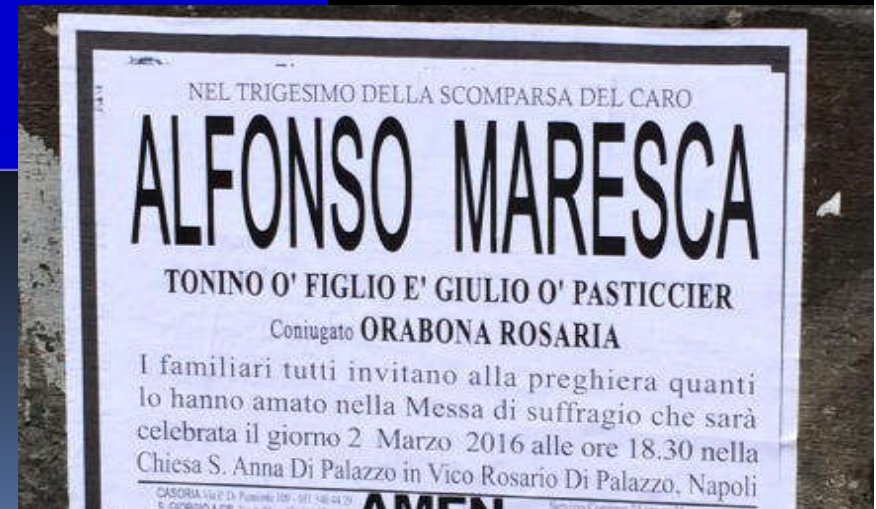
# *Interventi Psicosociali per i deficit cognitivi*

- *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  
REMEDICATION  
(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

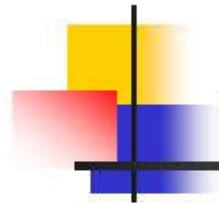
Poor Independent  
Living Skills

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

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- 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 <sup>a</sup>, Stefano Barlati <sup>a</sup>, Paolo Cacciani <sup>a</sup>, Luca DePeri <sup>b</sup>, Roberto Poli <sup>c</sup>,  
Emilio Sacchetti <sup>a,b</sup>, Antonio Vita <sup>a,b,\*</sup> 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 <sup>a</sup>, Marco Spangaro <sup>a,c</sup>, Margherita Bechi <sup>a</sup>, Maria Alice Baraldi <sup>b</sup>, Federica Cocchi <sup>a</sup>,  
Carmelo Guglielmino <sup>a</sup>, Laura Bianchi <sup>a</sup>, Antonella Mastromatteo <sup>a,c</sup>, Marta Bosia <sup>a,c,\*<sup>1</sup></sup>, Roberto Cavallaro <sup>a,c</sup>,  
Schizophrenia Research, 2017



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

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

Dawn I. Velligan<sup>1,2</sup>, Meredith Draper<sup>2</sup>, Donna Stutes<sup>2</sup>,  
Natalie Maples<sup>2</sup>, Jim Mintz<sup>2</sup>, Sara Tai<sup>3</sup>, and  
Douglas Turkington<sup>4</sup>

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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.

D. I. Velligan *et al.*

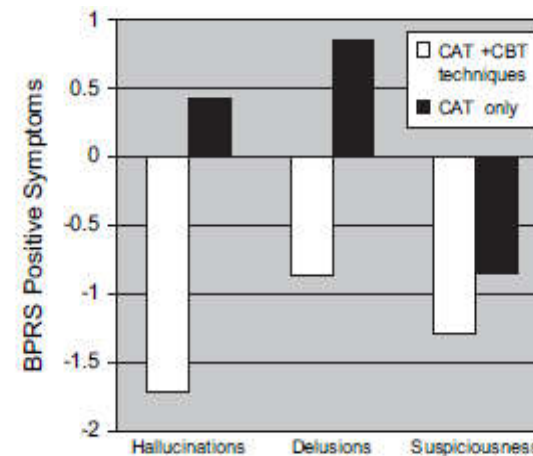


Fig. 3. Changes in Psychosis Symptoms Over Time in Cognitive Adaptive Training (CAT) Alone Vs CAT Conducted by Individuals With Cognitive Behavior Therapy Training. In mixed effects regression analyses with baseline scores used as covariates, differences between groups on levels of hallucinations and 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 were not ( $F_{1,11} = 0.07, P > .7$ ).



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

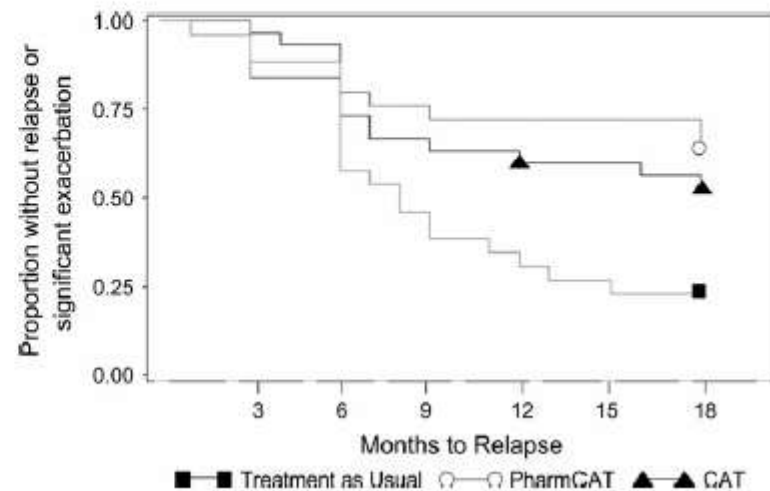
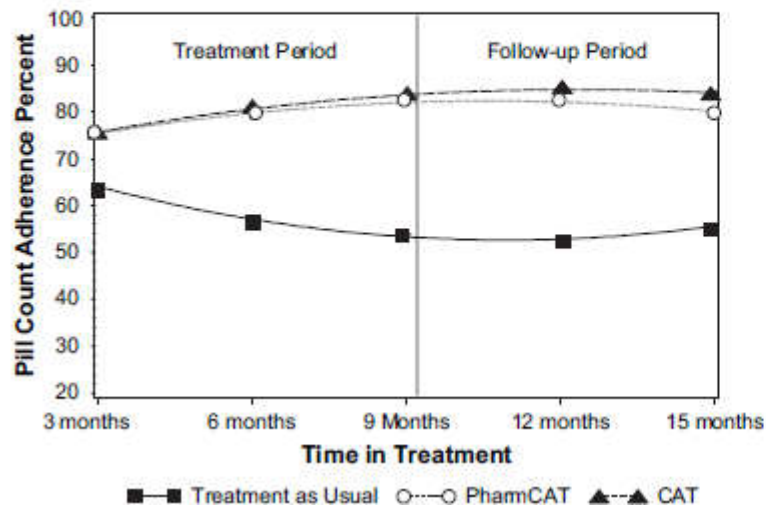
Dawn I. Velligan<sup>1,2</sup>, Pamela M. Diamond<sup>5</sup>, Jim Mintz<sup>2</sup>,  
Natalie Maples<sup>2</sup>, Xueying Li<sup>2</sup>, John Zeber<sup>2,6</sup>,  
Larry Ereshefsky<sup>3</sup>, Yui-Wing F. Lam<sup>4</sup>,  
Desiree Castillo<sup>2</sup>, and Alexander L. Miller<sup>2</sup>

<sup>2</sup>Department of Psychiatry; <sup>3</sup>Department of Pharmacotherapy Education and Research; <sup>4</sup>Department of Pharmacology, University of Texas Health Science Center at San Antonio, San Antonio, TX; <sup>5</sup>Center for Health Promotion and Prevention Research, University of Texas School of Public Health, Houston, TX; <sup>6</sup>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

### Environmental Supports, Adherence, and Outcome



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

Dawn I. Velligan<sup>\*1</sup>, Sara Tai<sup>2</sup>, David L. Roberts<sup>1</sup>, Natalie Maples-Aguilar<sup>1</sup>, Matt Brown<sup>1</sup>, Jim Mintz<sup>1</sup>, and Douglas Turkington<sup>3</sup>

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

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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.<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup>

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-

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

## 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:** Netherlands 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*