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Cognitive Enhancement Therapy for Adults with Autism Spectrum Disorder

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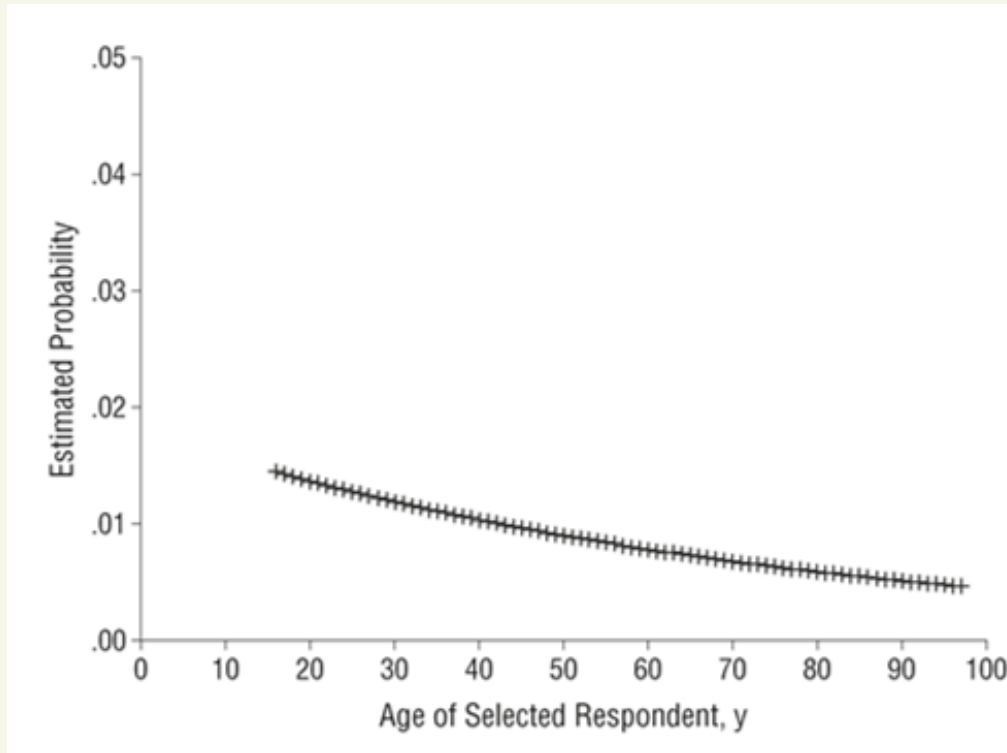
Disclosures

- No financial conflicts
- Grant support from:
 - NIH
 - Department of Defense
 - Autism Speaks
 - Autism Research Institute
 - Commonwealth of Pennsylvania

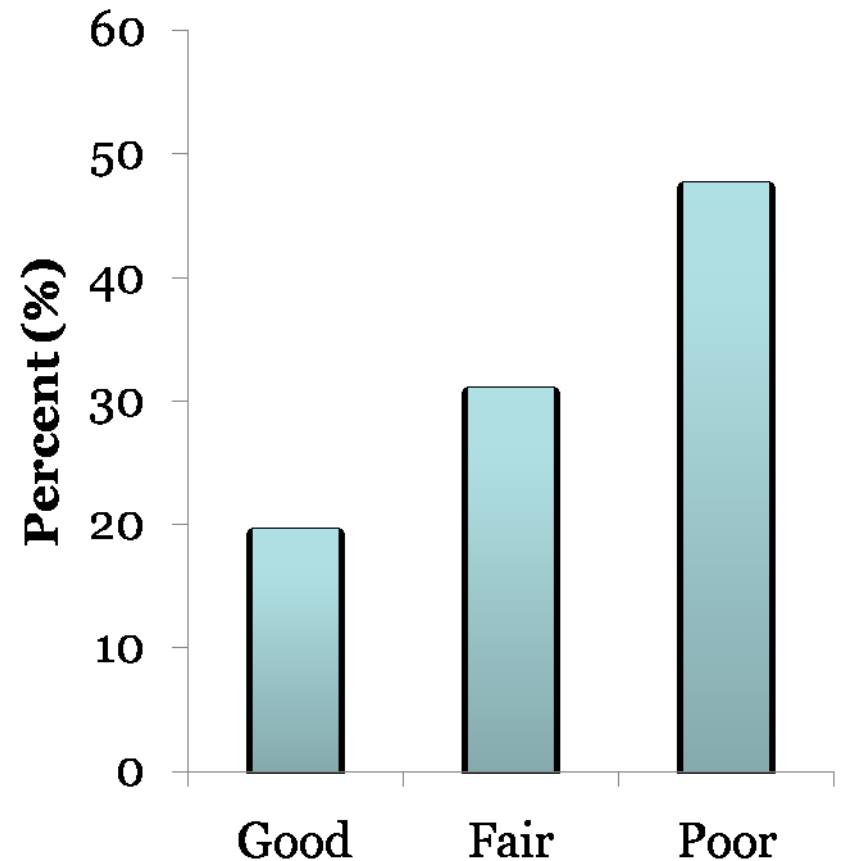


Autism Spectrum Disorder Exists in Adulthood

Prevalence
(*N* = 7403)



Outcome
(*N* = 828)



Brugha et al., 2011. *Arch Gen Psychiatry*. 68:459-465.

Steinhausen et al., in press. *Acta Psychiatr Scand*.



20-Year Outcome in Adult ASD

Rating	Friends/Acquaintances ^a (n = 59 ^b)	n (%)
0	One or more friend of approximately same age	5 (9)
1	One or more friend but restricted range of interests	9 (15)
2	No specific friendships but seeks contact with others in group situations	8 (14)
3	Never any peer relationships involving selectivity/sharing	37 (63)
Close relationships ^a (n = 60)		
0	Close reciprocal relationship(s) (e.g., sexual relationship/marriage) past or present	4 (7)
1	Some reciprocal relationships but short duration and/or reduced sharing of activities	6 (10)
2	Only ever very brief relationships, involving minimal sharing of activities	4 (7)
3	No reciprocal relationships lasting >1 month or never had relationship	46 (77)
Professional or highly skilled	Computer programmer (construction design); engineer (nuclear research)	2 (3)
Nonmanual skilled	Project manager × 2 (civil service; telecom); artist (self-employed); accounts clerk (× 2); town planner; civil servant	7 (12)
Manual skilled	Electronics work	1 (2)
Partly skilled	Postal workers (× 2)	2 (3)
Unskilled and untrained	Postal work (family firm); McDonald's; sales assistant; cleaning/sorting in theatrical costumiers; factory assembly/packing work	5 (8)
Ph.D. student/voluntary lobbying work		1 (2)
Sheltered/voluntary employment	Basic industrial work/cleaning × 2; care-home/charity shop × 4; railway guard; kitchen/ gardening work × 2	9 (15)
Never worked/long-term unemployed		33 (55)



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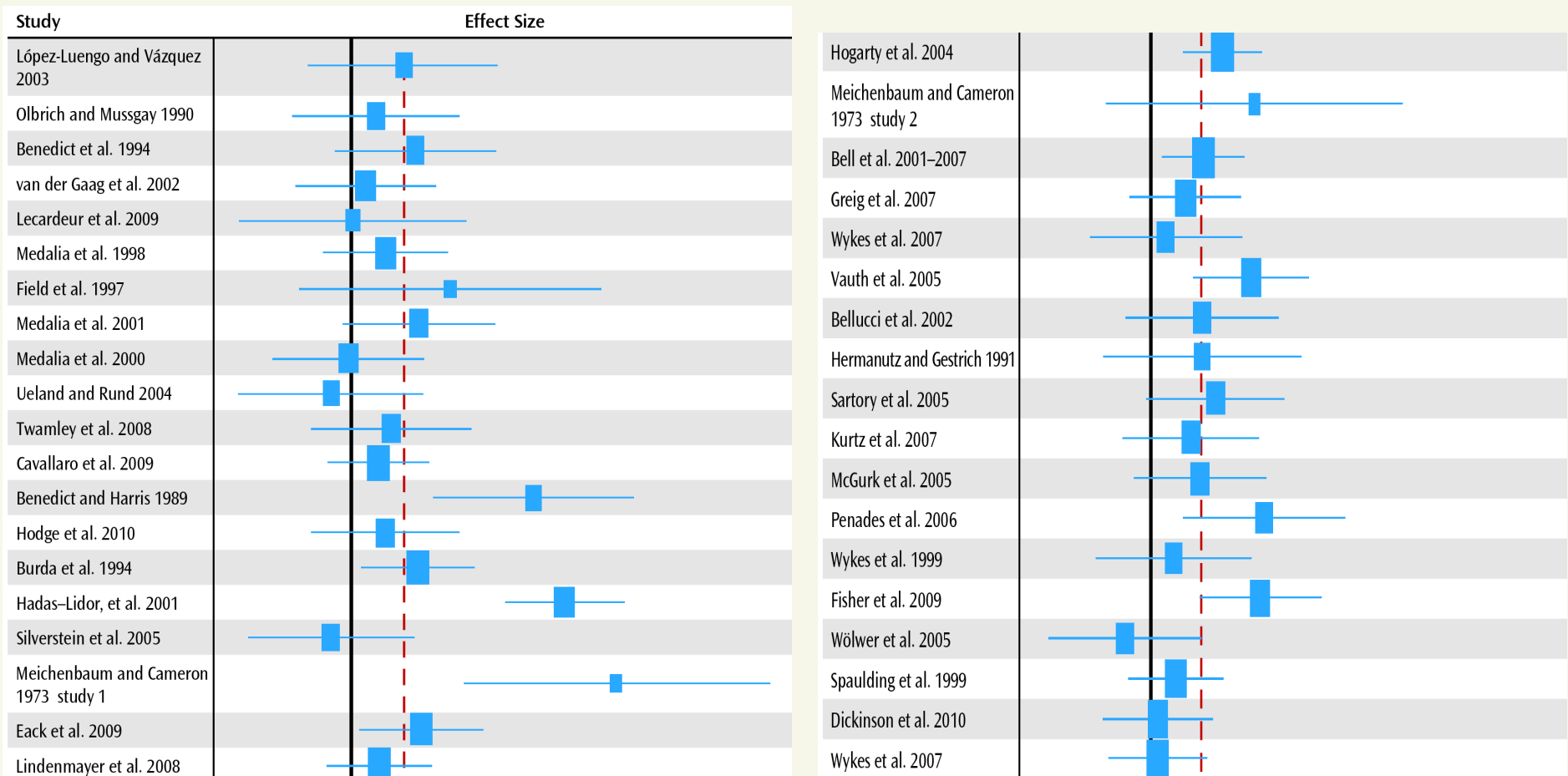
WHAT CAN HELP?



Study	<i>n</i>	Mean age	% male	Mean IQ	Method	Type of intervention	Outcome category	Cohen's <i>d</i>
Baker et al. (2005)	1	–	100	–	Case study	ABA	Repetitive behavior	–
Bölte et al. (2002)	10	27.2	100	104.2 ^a	RCT	Social cognition training	Social cognition	3.59
Faja et al. (2012)	13	22.4	–	116.3 ^a	RCT	Social cognition training	Face and house recognition	0.75
Gantman et al. (2012)	17	20.4	70.6	96.7 ^a	RCT	Social cognition training	Deficits in social interaction	1.209
García-Villamizar and Dattilo (2010)	71	30.81	57.7	–	RCT	Other	Adaptive behavior	0.83
García-Villamizar and Hughes (2007)	44	25.52	72.7	–	Non-randomized controlled	Other	Cognitive functioning	0.45
Golan and Baron-Cohen (2006), Experiment 1	65	28.72	76.73	109.05 ^b	Non-randomized controlled	Social cognition training	Cognitive functioning	0.25
Golan and Baron-Cohen (2006), Experiment 2	39	24.95	84.6	101.1 ^b	Non-randomized controlled	Social cognition training	Social cognition	0.14
McDonald and Hemmes (2003)	1	18	100	–	Case study	ABA	Communication	–
Moore 2009	1	18	100	–	Case study	ABA	Repetitive behavior	–
Rehfeldt and Chambers (2003)	1	23	100	–	Case study	ABA	Repetitive behavior	–
Shabani and Fisher (2006)	1	18	100	–	Case study	ABA	Adaptive behavior	–
Trepagnier et al. (2011)	16	19.77	93.8	109.4 ^a	Non-controlled	Social cognition training	Communication	0.58
Turner-Brown et al. (2008)	11	36.27	90.91	112.07 ^a	Non-randomized controlled	Social cognition training	Deficits of social interaction social cognition	0.27



RCTs of Cognitive Remediation in Schizophrenia ($k = 38$)





State of Treatment for ASD





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WHERE TO START?

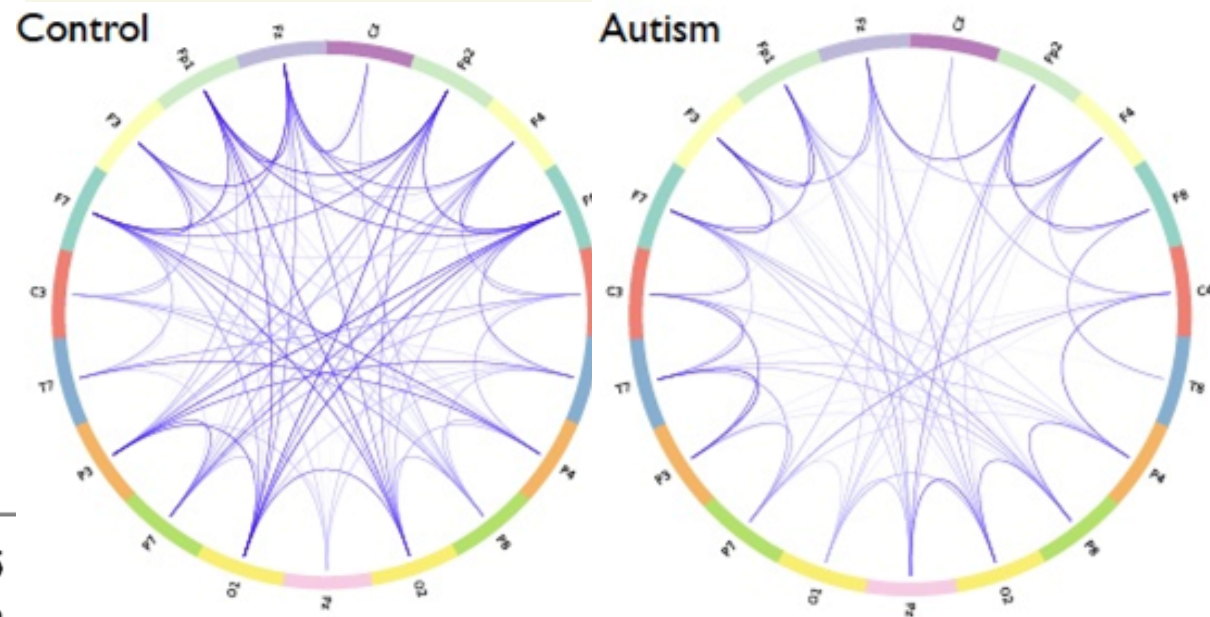
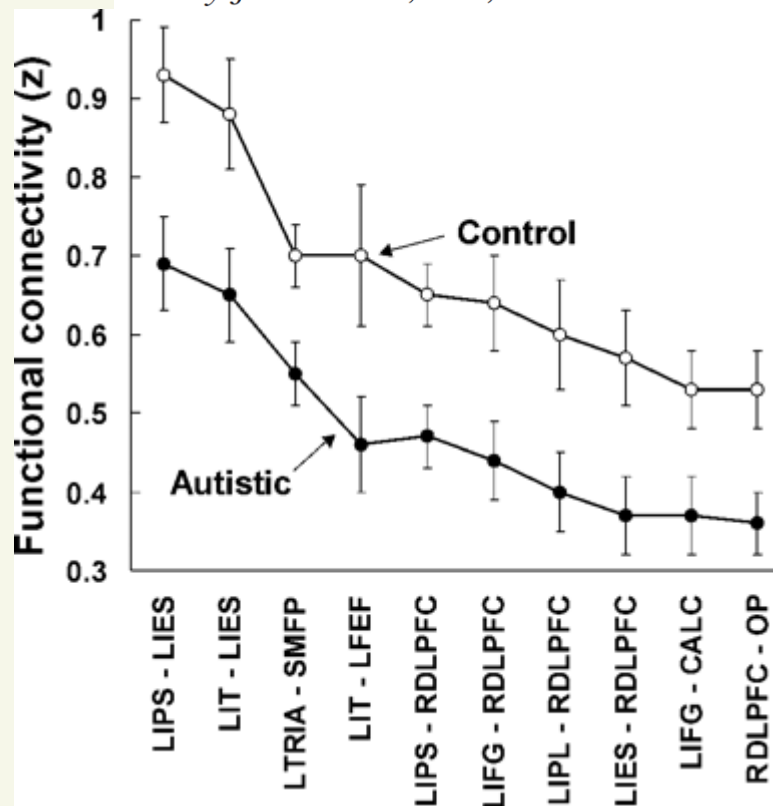


Autism is a Brain Disorder

The New Neurobiology of Autism

Cortex, Connectivity, and Neuronal Organization

Nancy J. Minshew, MD; Diane L. Williams, PhD



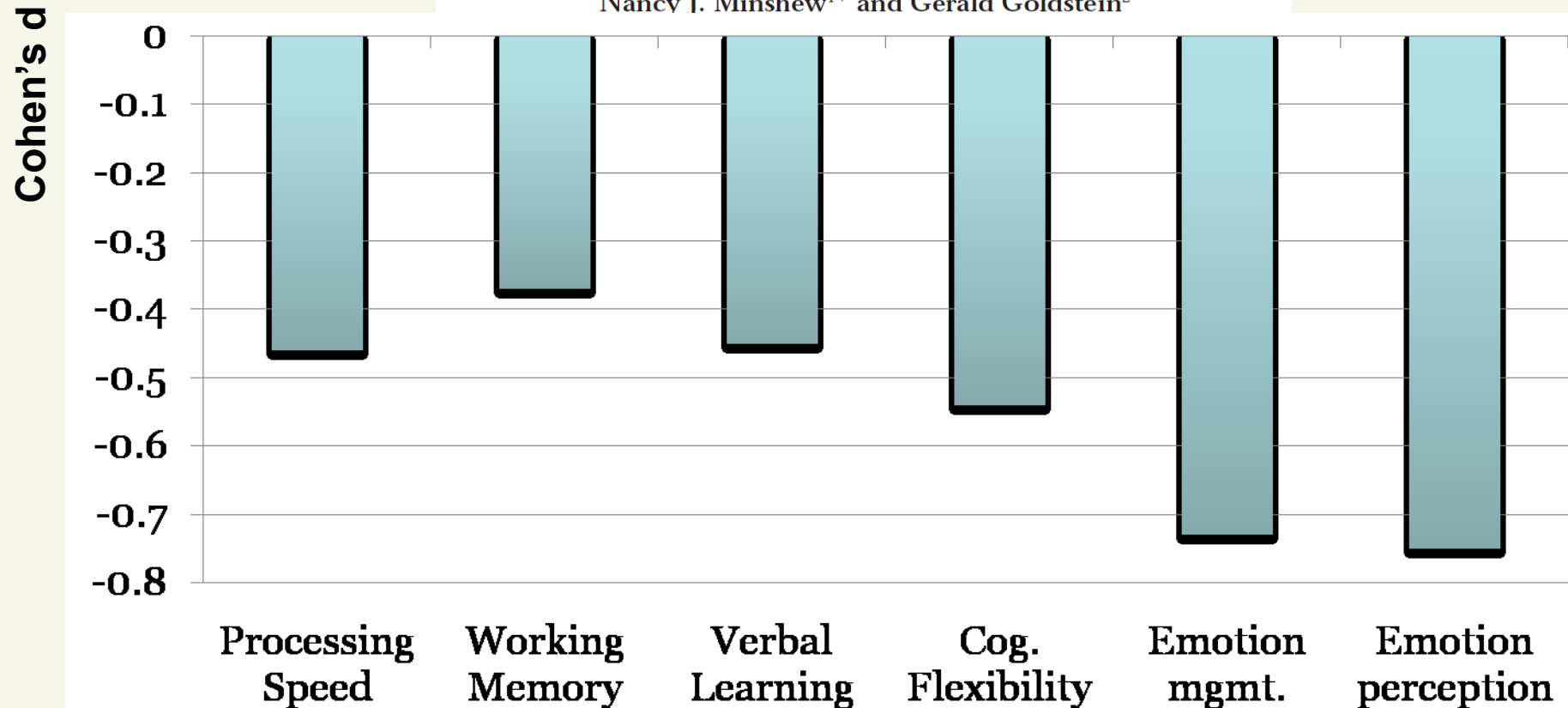
Just et al., 2004. *Brain*. 127:1811-1821; Minshew & Williams, 2007. *Arch Neurol*. 64:945-50; Peters et al., 2013. *BMC Medicine*. 11:54.



Brain-Based Cognitive Impairment in Adult Autism ($N = 40$)

AUTISM AS A DISORDER OF COMPLEX INFORMATION PROCESSING

Nancy I. Minshew^{1*} and Gerald Goldstein²





Promise of Cognitive Remediation

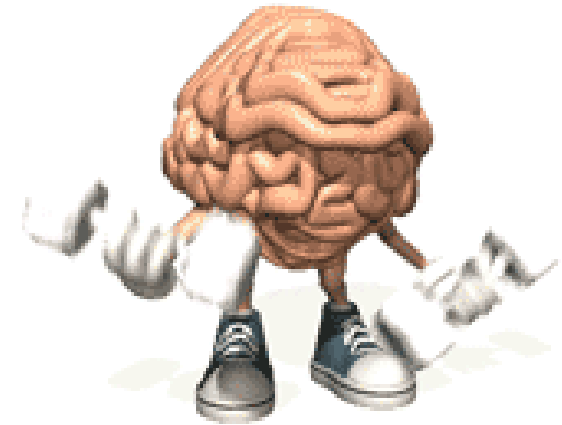
Review Article

Cognitive training in Alzheimer's disease:
a meta-analysis of the literature

Cognitive training in Parkinson disease

A systematic review and meta-analysis

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



Effectiveness of Cognitive Rehabilitation following Acquired Brain Injury:
A Meta-Analytic Re-Examination of Cicerone et al.'s (2000, 2005)
Systematic Reviews

**Computerized Cognitive Training in Cognitively Healthy
Older Adults: A Systematic Review and Meta-Analysis of
Effect Modifiers**

Review

Cognitive intervention for persons with mild cognitive impairment:
A meta-analysis

REVIEW

**Cognitive Remediation in Anorexia Nervosa and Related
Conditions: A Systematic Review**

**Cognitive Training for Attention-Deficit/Hyperactivity
Disorder: Meta-Analysis of Clinical and
Neuropsychological Outcomes From Randomized
Controlled Trials**

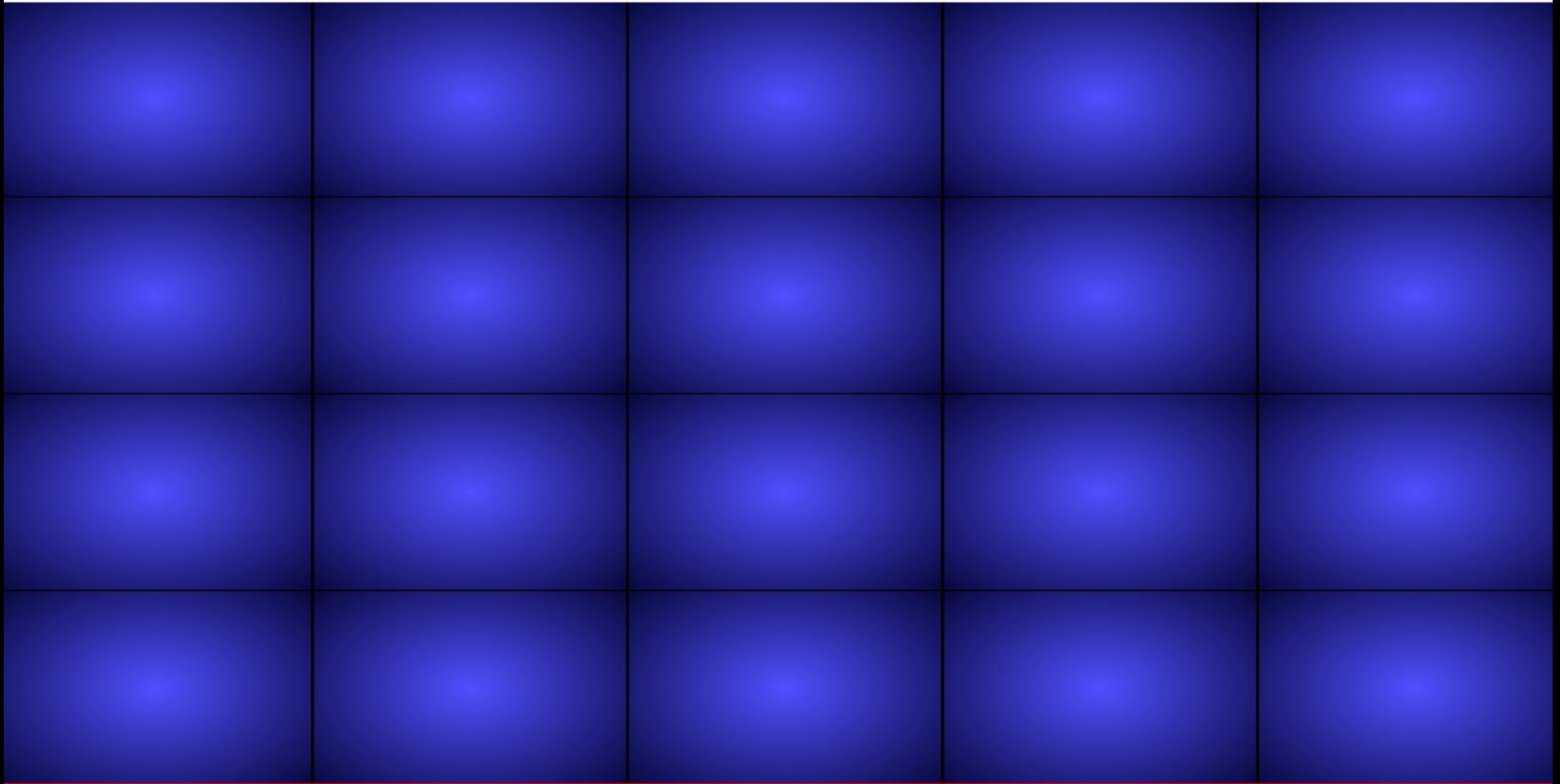


Cognitive Enhancement Therapy

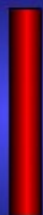
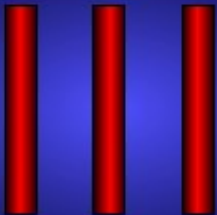
- A recovery-phase intervention for remediating neurocognitive and social-cognitive deficits originally developed by Hogarty and colleagues (2004, 2006) for schizophrenia.
- Neurocognitive Training
 - Computer-based training in attention, memory, and problem-solving.
 - 1 hour/week
 - 60 hours total
- Social-Cognitive Group Therapy
 - Training in perspective-taking, gistfulness, non-verbal communication, emotion perception, and much, much more.
 - 1.5 hours/week
 - 45 sessions
- More information and CET Training Manual (Hogarty & Greenwald, 2006) at
www.CognitiveEnhancementTherapy.com

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Start



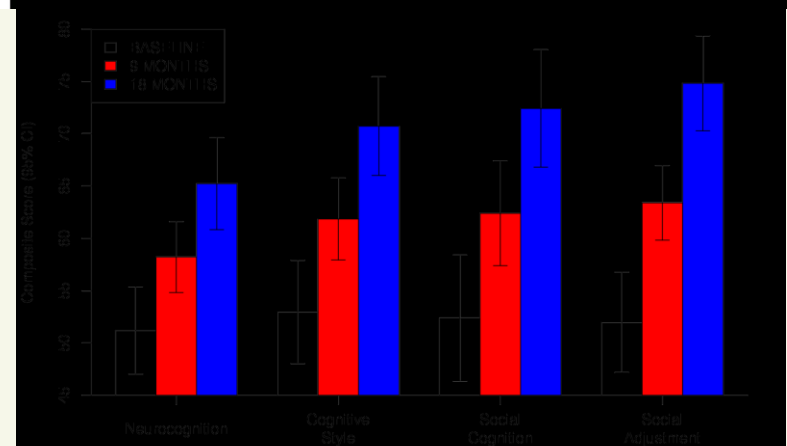
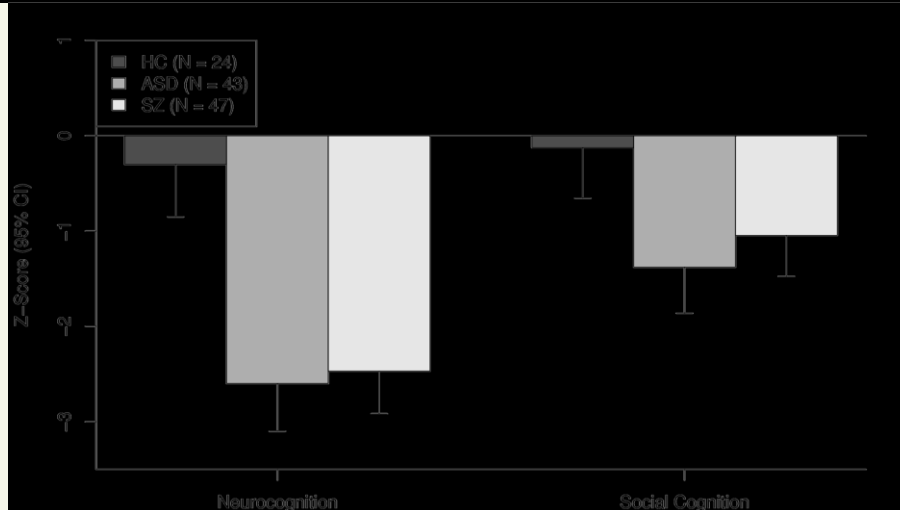
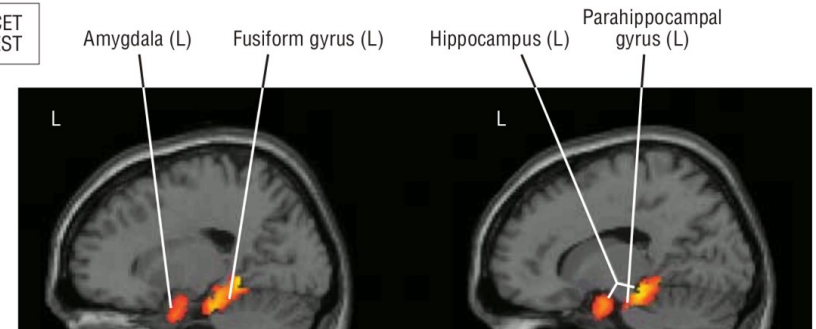
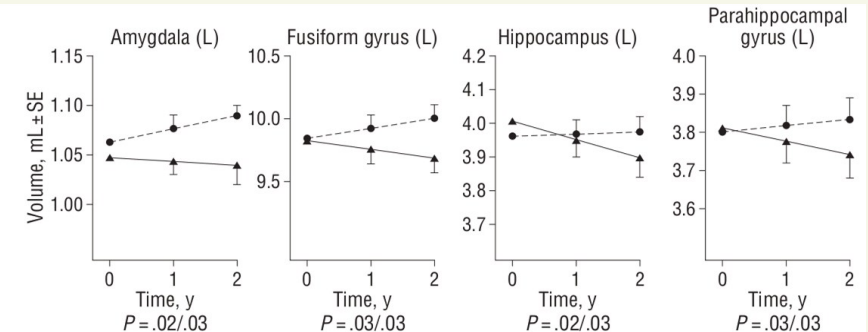
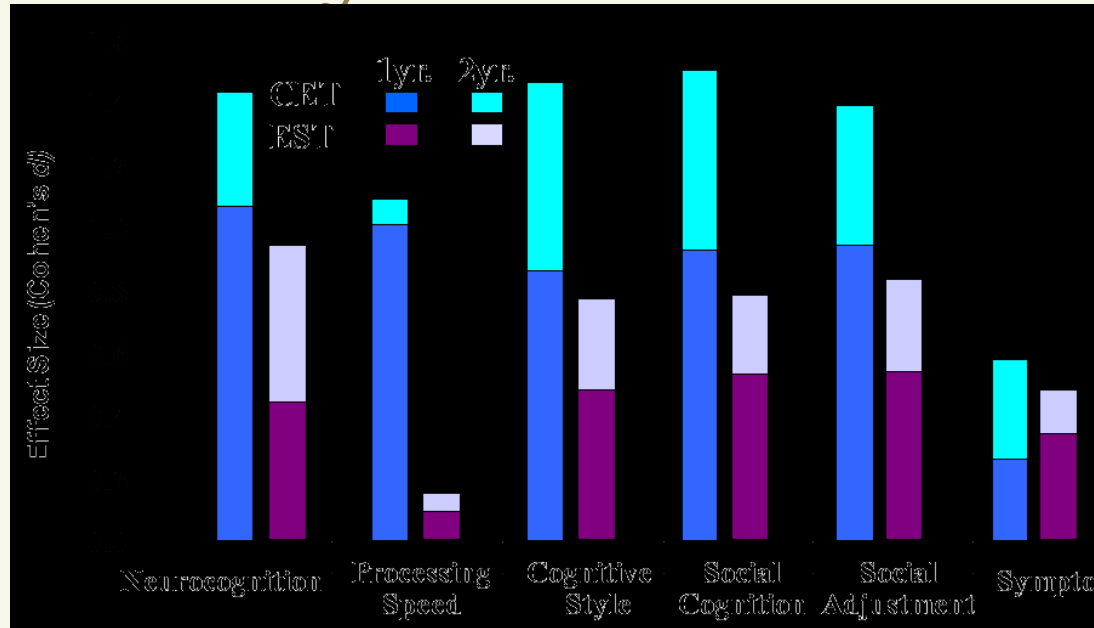


Social-Cognitive Training

- Small group structure (6-8 members)
- Contains coaches rather than therapists
- Structured format
- Example content areas:
 - Understanding ASD
 - Cognitive flexibility
 - Acting wisely in social situations
 - Appraising the social context
 - Taking another person's perspective
 - Reading non-verbal cues



Why CET for Adults with ASD?



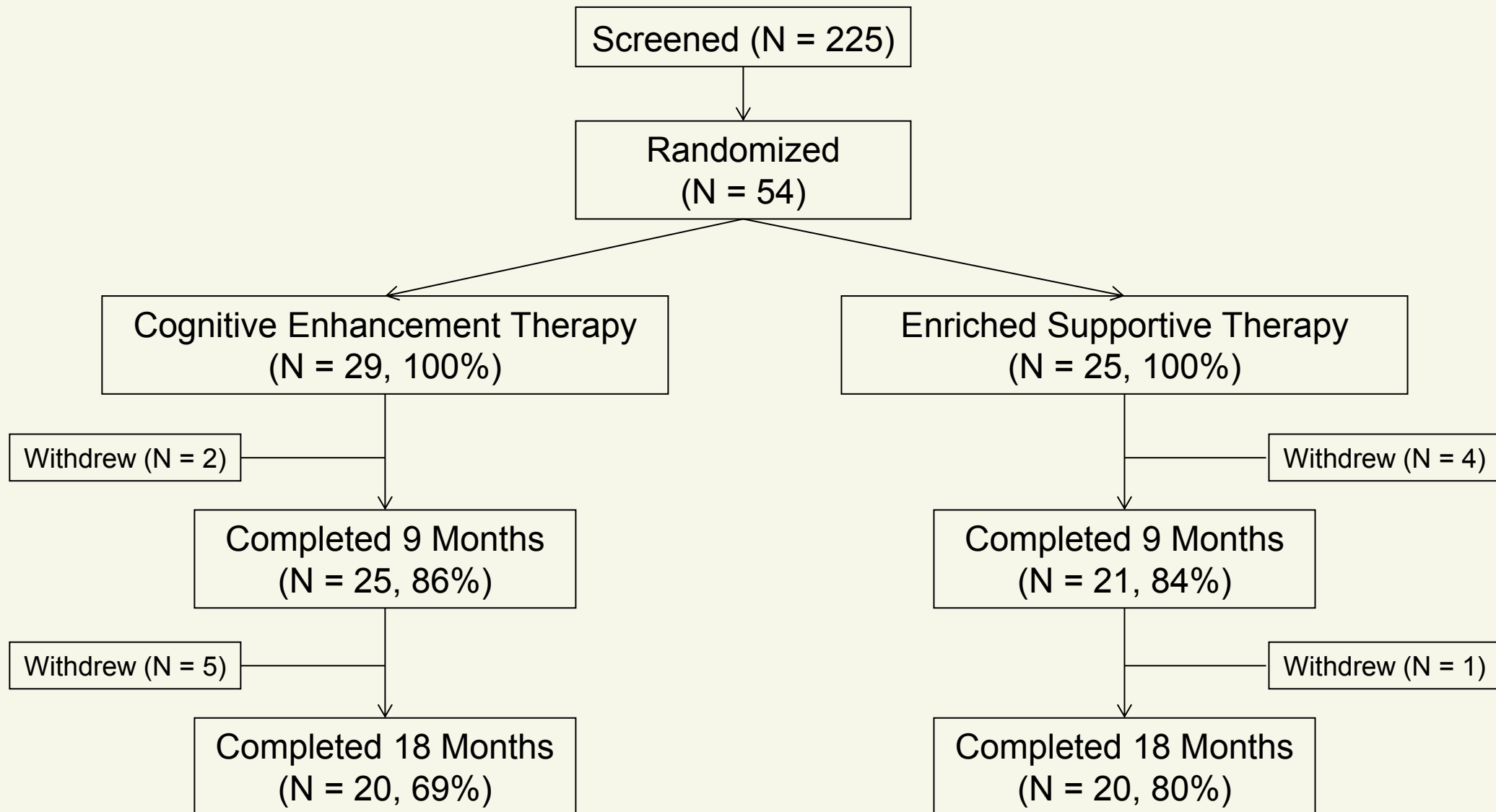


First Trial of CET in Adult ASD

- Thank you NIMH, DoD, Autism Speaks, and ARI!
- Inclusion criteria:
 - Autism or autism spectrum disorder based on the ADOS or ADI-R
 - Age 16-45
 - $IQ \geq 80$
 - Not abusing substance within past 3 months
 - No significant disruptive behavior
 - Significant cognitive and social disability
- Randomized to CET or an active Enriched Supportive Therapy (EST) control and treated for 18 months
- Assessed at baseline, 9, and 18-months



First Trial of CET in Adult ASD



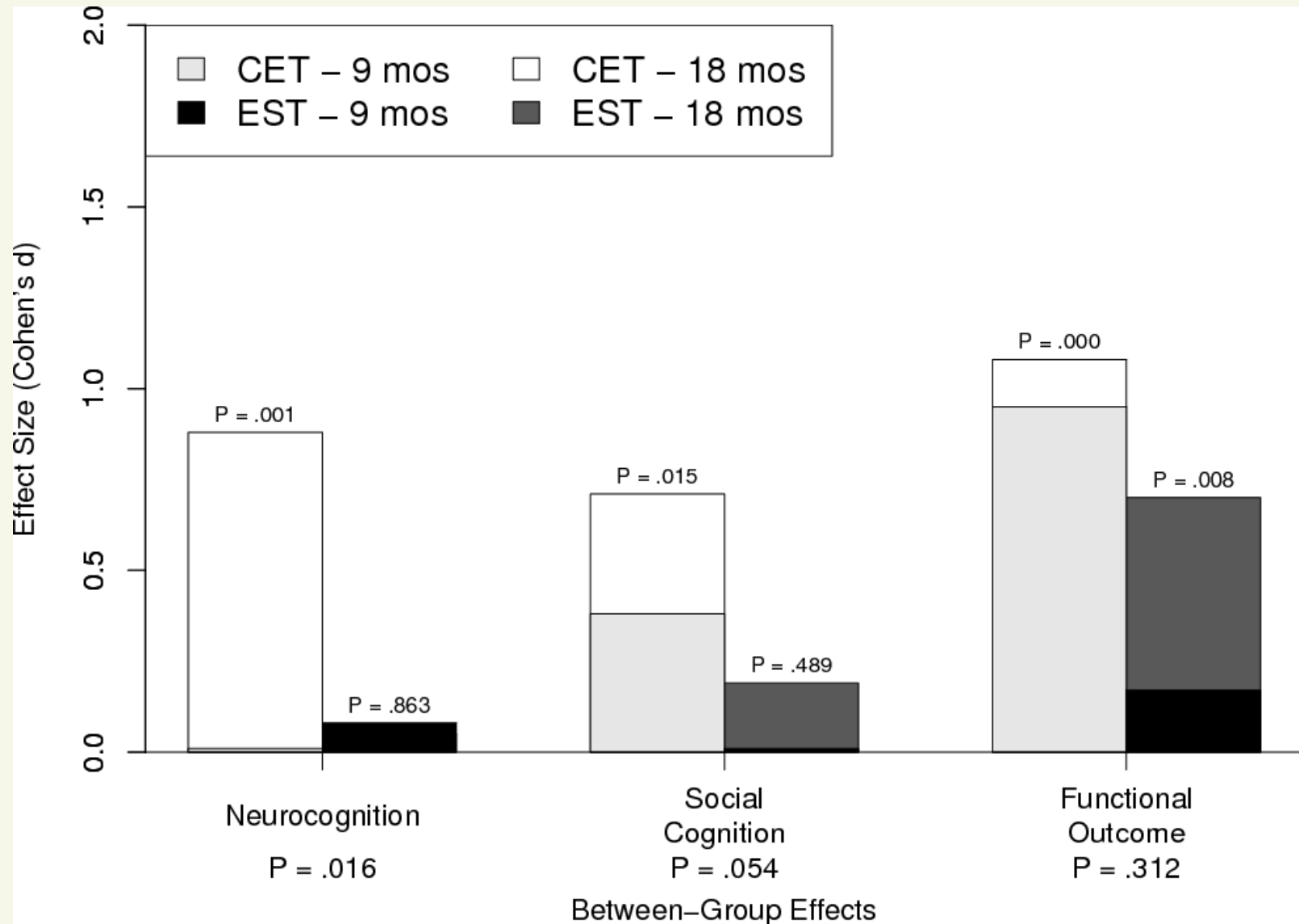


Baseline Characteristics (N = 54)

	CET		EST	
Variable	M / N	SD / %	M / N	SD / %
Age	22.55	6.38	23.52	5.69
% Male	24	83%	23	92%
% College	15	54%	19	79%
% Employed	7	25%	9	38%
% Dependent	24	86%	20	83%
IQ	107.97	14.35	106.24	15.30
% Autism	16	55%	11	44%
MATRICES	26.59	26.23	32.73	30.32

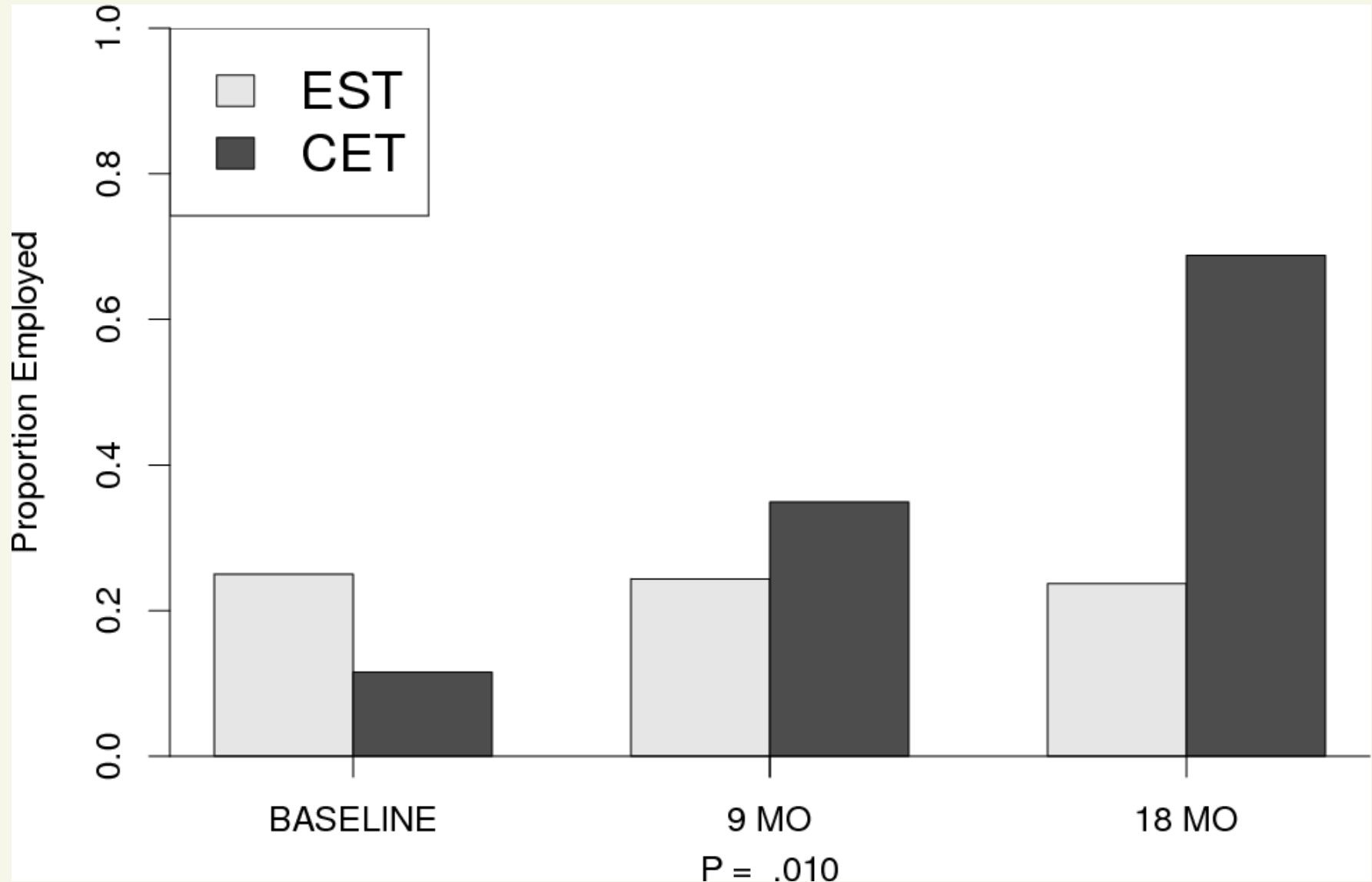


Preliminary Effects on Cognition and Behavior (N = 44)



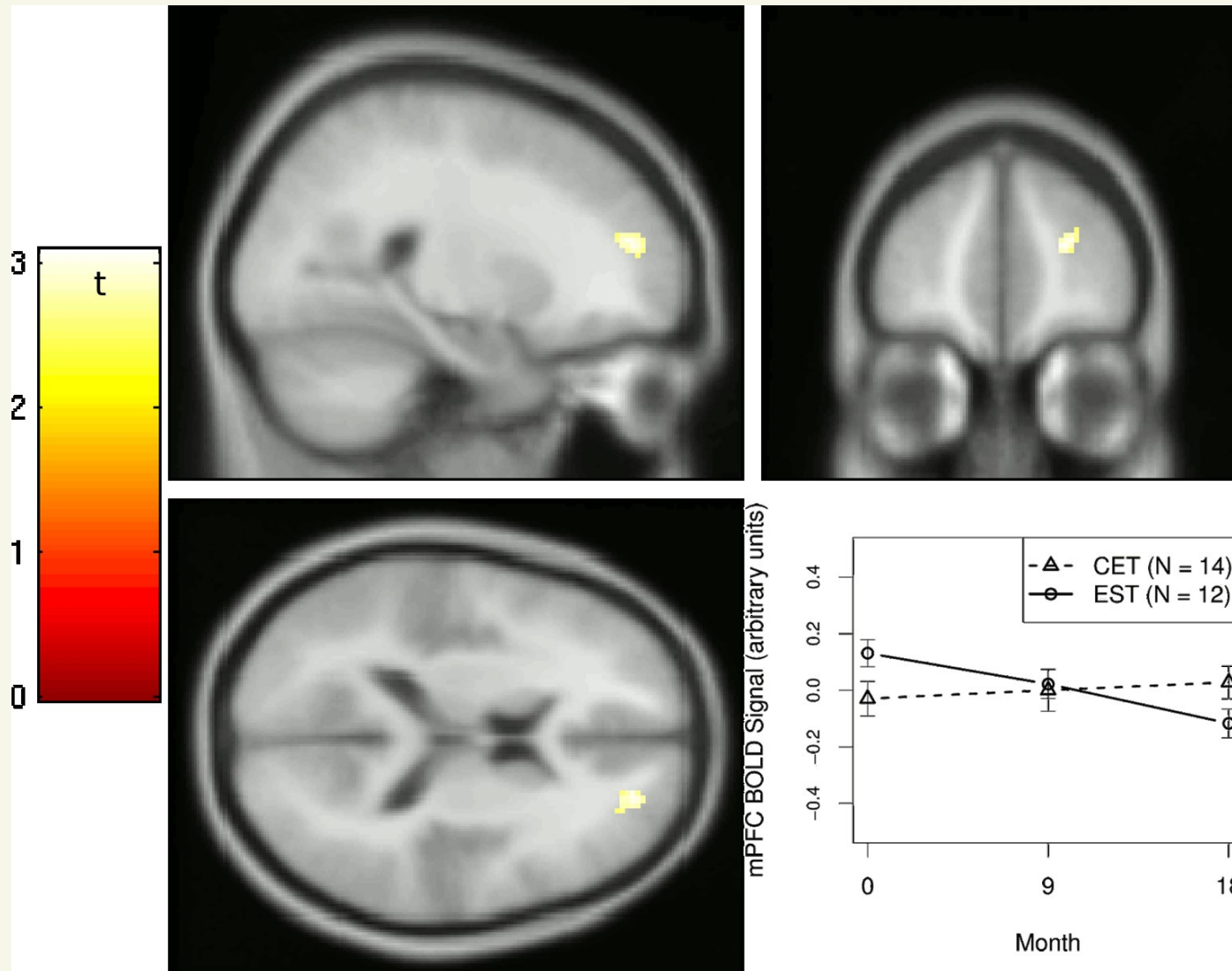


Preliminary Effects on Employment (N = 44)



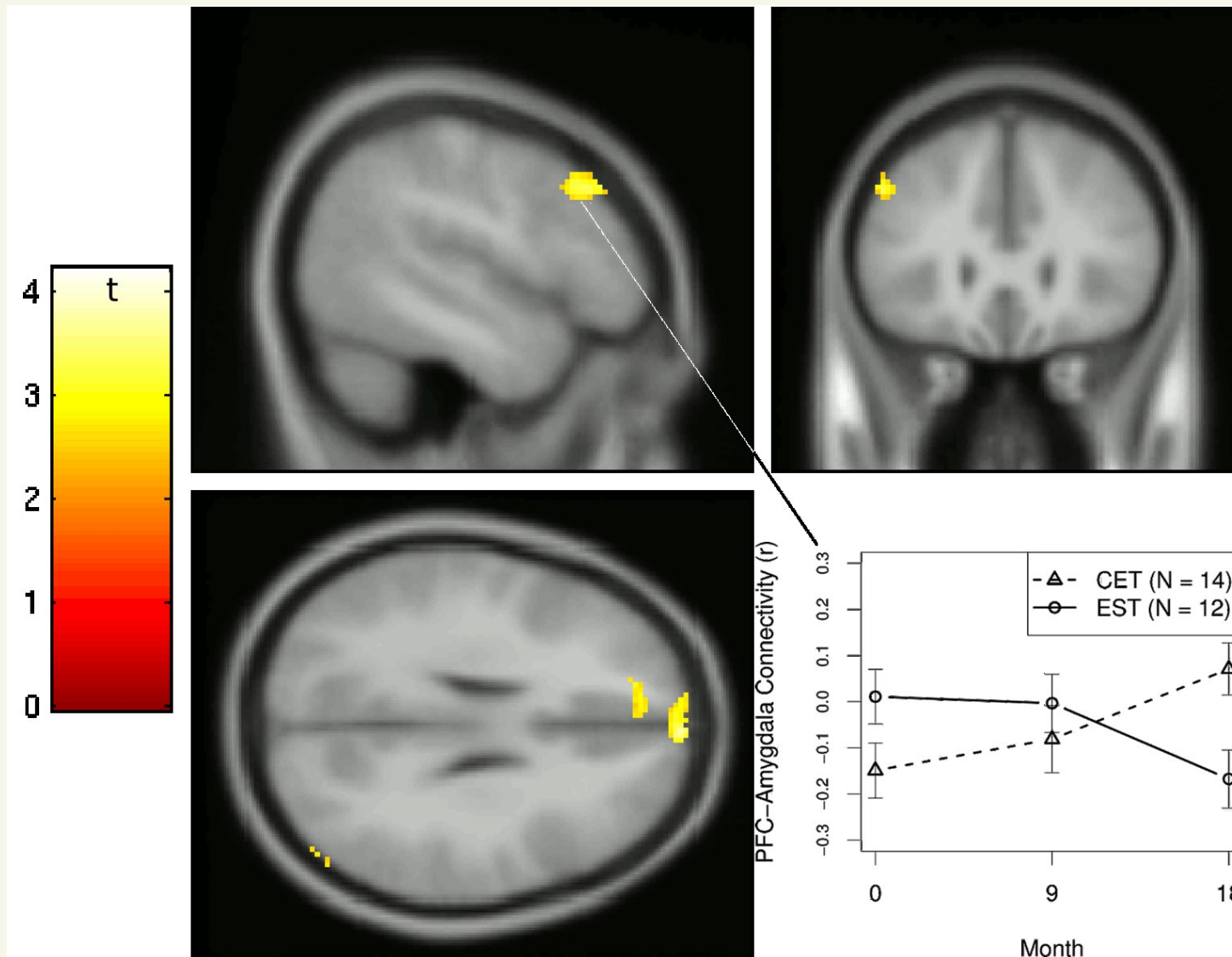


Preliminary Effects on Brain Function (N = 26)





Preliminary Effects on Functional Connectivity (N = 26)





Conclusions

- A crisis exists in treatment development for adults with ASD
- More treatment studies are urgently needed that can be funded and conducted quickly
- Cognitive remediation may help address core deficits in information processing
- Individual support, education, and emotion management may also help
- CET appears to be a promising treatment for adult ASD



Acknowledgments

Key Collaborators

- Nancy J. Minshew, M.D.
- Susan S. Hogarty, M.S.N.
- Deborah P. Greenwald, Ph.D.
- Marcel A. Just, Ph.D.
- Matcheri S. Keshavan, M.D.