The International Consensus Statement on Attention Deficit Hyperactivity Disorder: Diagnosis and Treatment

Stephen V. Faraone, Ph.D.

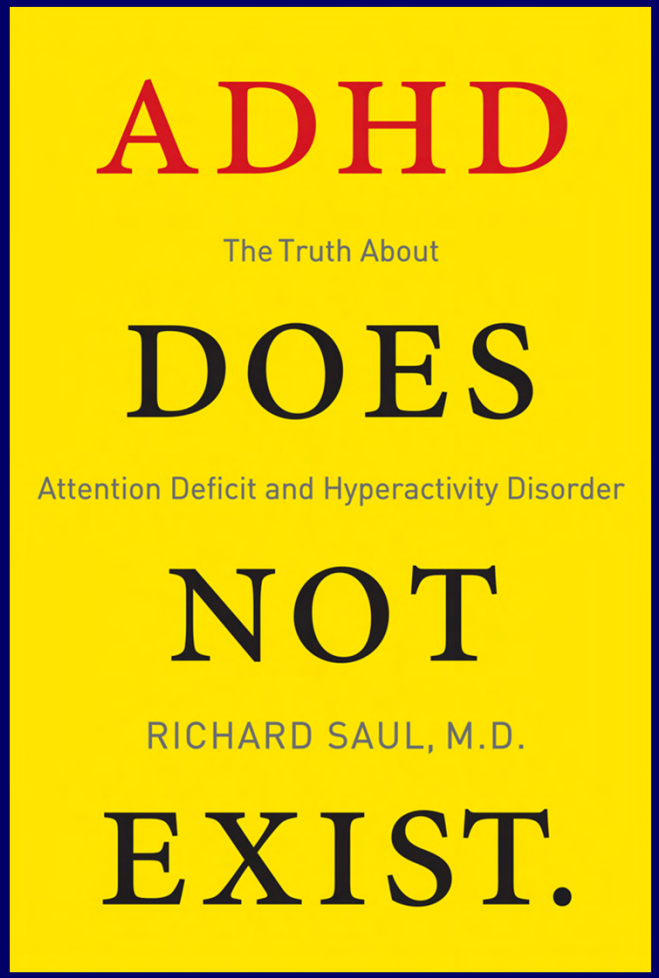
President, World Federation of ADHD
Distinguished Professor
Departments of Psychiatry & of Neuroscience and Physiology
SUNY Upstate Medical University
@StephenFaraone

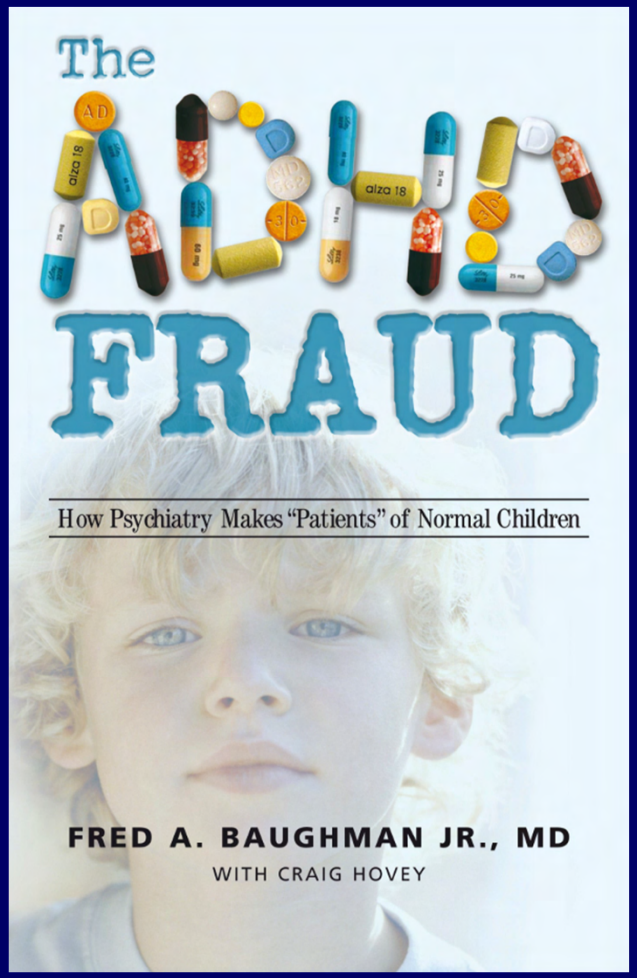
From www.ADHDevidence.org

Why do We Need an International Consensus Statement?

We need an international consensus statement to correct misconceptions about ADHD that stigmatize affected people, reduce the credibility of caregivers and limit access to treatment

From www.ADHDevidence.org





From www.ADHDevidence.org

Big Pharma's Manufactured Epidemic: The Misdiagnosis of ADHD

Investigative journalist Alan Schwarz sounds the alarm

By Gareth Cook on October 11, 2016

SCIENTIFIC AMERICAN®

From www.ADHDevidence.org

Stigma Reduces Access to Evidence-Based Treatments

- In 2020, the World Health Organization decided to exclude methylphenidate from its Essential Medicines List for Children.
- An international team wrote a letter of complaint and, this year, filed a formal appeal.
- In 2021, WHO rejected the appeal stating that the first line treatment for ADHD in WHO guidelines are “environmental, behavioural and psychosocial” even though the evidence basis for these treatments is weak and they are not widely available, especially in low- and middle-income countries

From www.ADHDevidence.org

Methodology for the ICS ADHD Project

From www.ADHDevidence.org

Steering Committee for the ICS ADHD

- World Federation of ADHD
- European Network for Hyperkinetic Disorders (Eunethydis)
- American Professional Society of ADHD and Related Disorders
- Canadian ADHD Resource Alliance
- Asian Federation of ADHD
- Latin American League of ADHD
- Australian ADHD Professionals Association
- Israeli Society of ADHD
- Saudi ADHD Society
- Neurodevelopmental Disorders Across Lifespan section of the European Psychiatric Association
- ADHD Guidelines Group of the Association of Medical Scientific Societies in Germany
- ADHD Network of European College of Neuropsychopharmacology
- Chinese Society of Child and Adolescent Psychiatry
- ADHD Section of the World Psychiatric Association

From www.

The SC recommended authors. MDs and PhDs Represented

Home Countries of Steering Committee and Authors Suggested by Steering Committee (Total = 77)

The 77 authors come from 25 countries and 6 continents.

From www.ADHDevidence.org

The ICS ADHD: Inclusion Criteria

- The ICS ADHD records evidenced-based conclusions supported by:
  - meta-analyses.
  - very large studies (N >2,000)

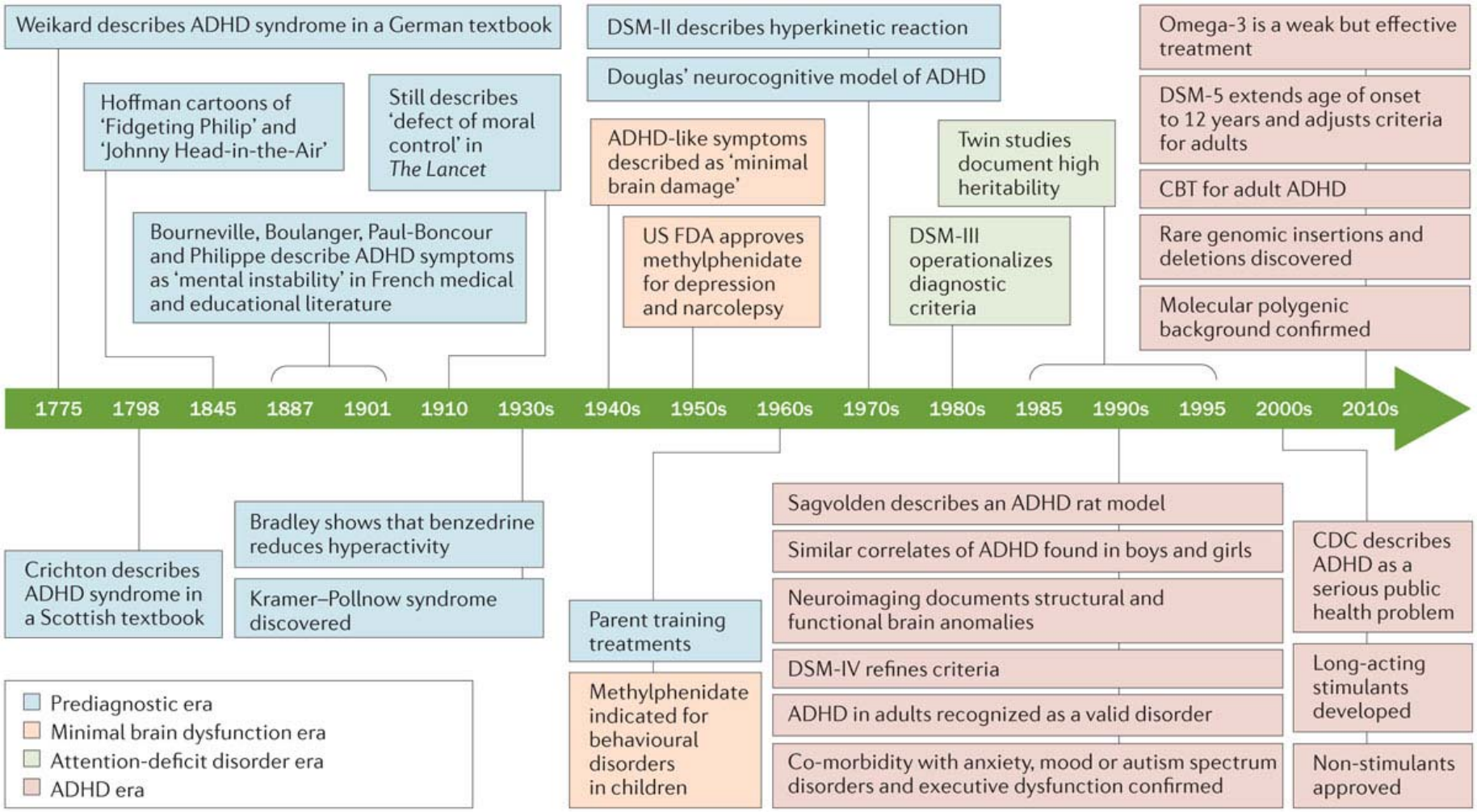
From www.ADHDevidence.org

Three Major Myths about ADHD

1. It was exported to the world by the USA
2. It is a recent invention
3. It medicalizes normal behaviors

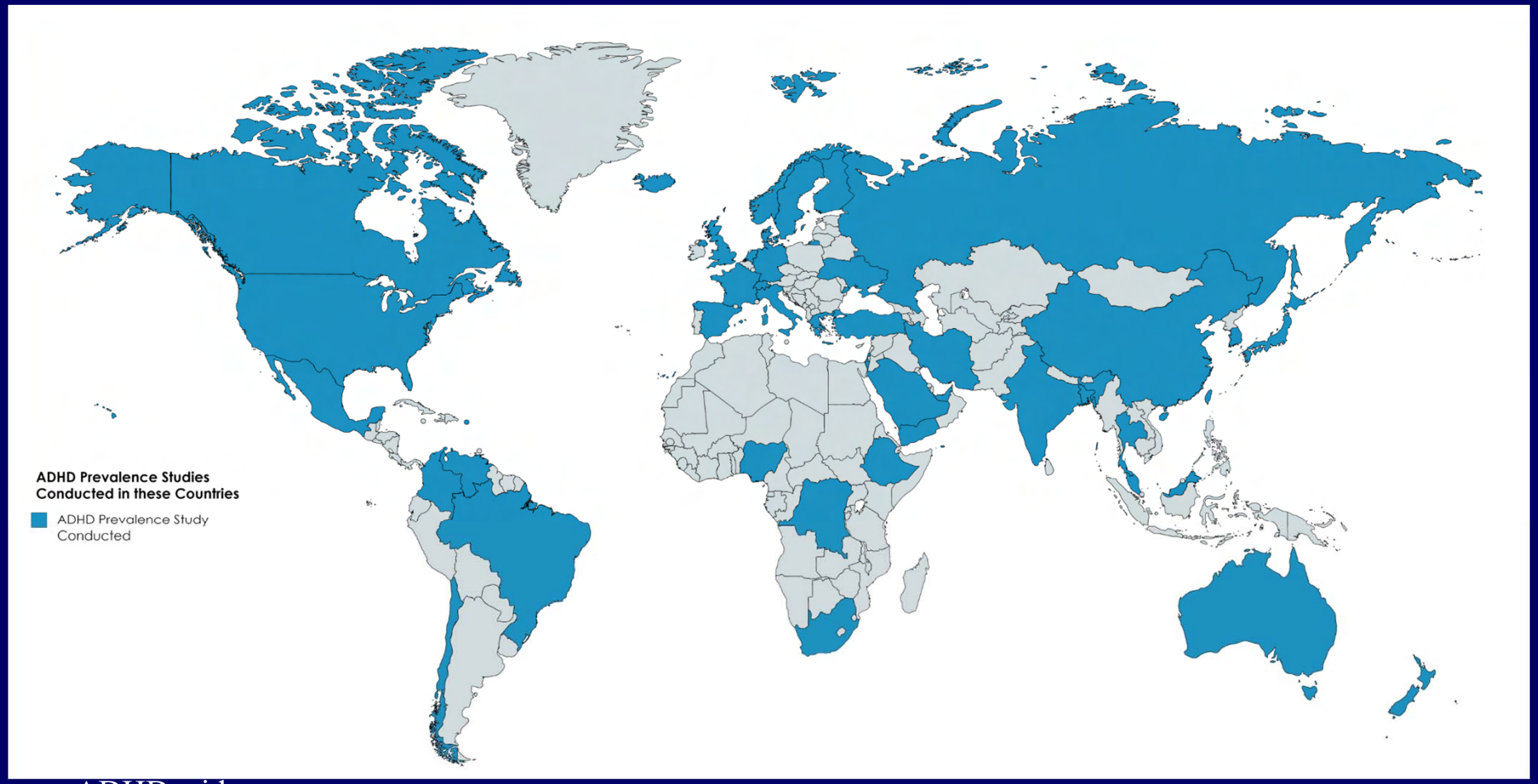
From www.ADHDevidence.org

The History of ADHD



Faraone, S. V. *et al.* (2015) Attention-deficit/hyperactivity disorder *Nat. Rev. Dis. Primers* doi:10.1038/nrdp.2015.20

Countries Providing Data about the Prevalence of ADHD



From www.ADHDevidence.org

Does ADHD "Medicalize" Normal Behaviors?: Real World Outcomes

- Low quality of life
- Substance use disorders
- Accidental injuries
- Educational underachievement
- Unemployment
- Gambling
- Teenage pregnancy
- Difficulties socializing
- Delinquency and Criminality
- Suicide, and premature death.

From www.ADHDevidence.org

Source: Anonymous r/ADHD Reddit user

What Does the ICS ADHD Tell us About Diagnosing ADHD?

From www.ADHDevidence.org

Main Features of ADHD Diagnosis

(American Psychiatric Association, 2013 & 2 other sources)

1) The presence of developmentally inappropriate levels of hyperactive-impulsive and/or inattentive symptoms for at least 6 months.
2) Symptoms occur in different settings (e.g., home and school).
3) Symptoms cause impairments in living.
4) Some symptoms and impairments first occur in early to mid-childhood.
5) No other disorder better explains the symptoms.

From www.ADHDevidence.org

Association between ADHD & other Disorders

(Bernardi et al. Psychol Med. 2012 & 6 other sources)

Many clinic often psycl depre spect disor disor disorders, and substance use disorders. Their presence does not rule out a diagnosis of ADHD.

From www.ADHDevidence.org

	ADHD ($n = 807$, 2.51%)	General population ($n = 33\,846$, 97.49%)
Any psychiatric disorder	94.98 (92.78–96.54)	64.54 (63.22–65.84)
Any Axis I disorder	92.64 (90.22–94.50)	61.95 (60.52–63.36)
		.36–23.91)
		8–6.61)
		5–3.60)
		.29–28.21)
		.89–15.36)
		8–6.38)
		7–7.64)
		5–3.33)
		.72–21.22)
		7–3.17)
Schizotypal	22.42 (19.04–26.21)	3.46 (3.19–3.75)
Narcissistic	25.16 (21.82–28.83)	5.69 (5.31–6.10)
Borderline	33.69 (29.90–37.71)	5.17 (4.83–5.54)
Histrionic	10.74 (8.34–13.72)	1.57 (1.42–1.74)
Antisocial	18.86 (15.80–22.35)	3.46 (3.16–3.78)

At a recent meeting with my psychologist he told me that in a few years time there will be no point in continuing my medication because as someone with ADHD goes into their mid 20's ADHD "swaps" for a different mental disorder and the ADHD symptoms go away.

Genetic Associations Between ADHD and other Disorders

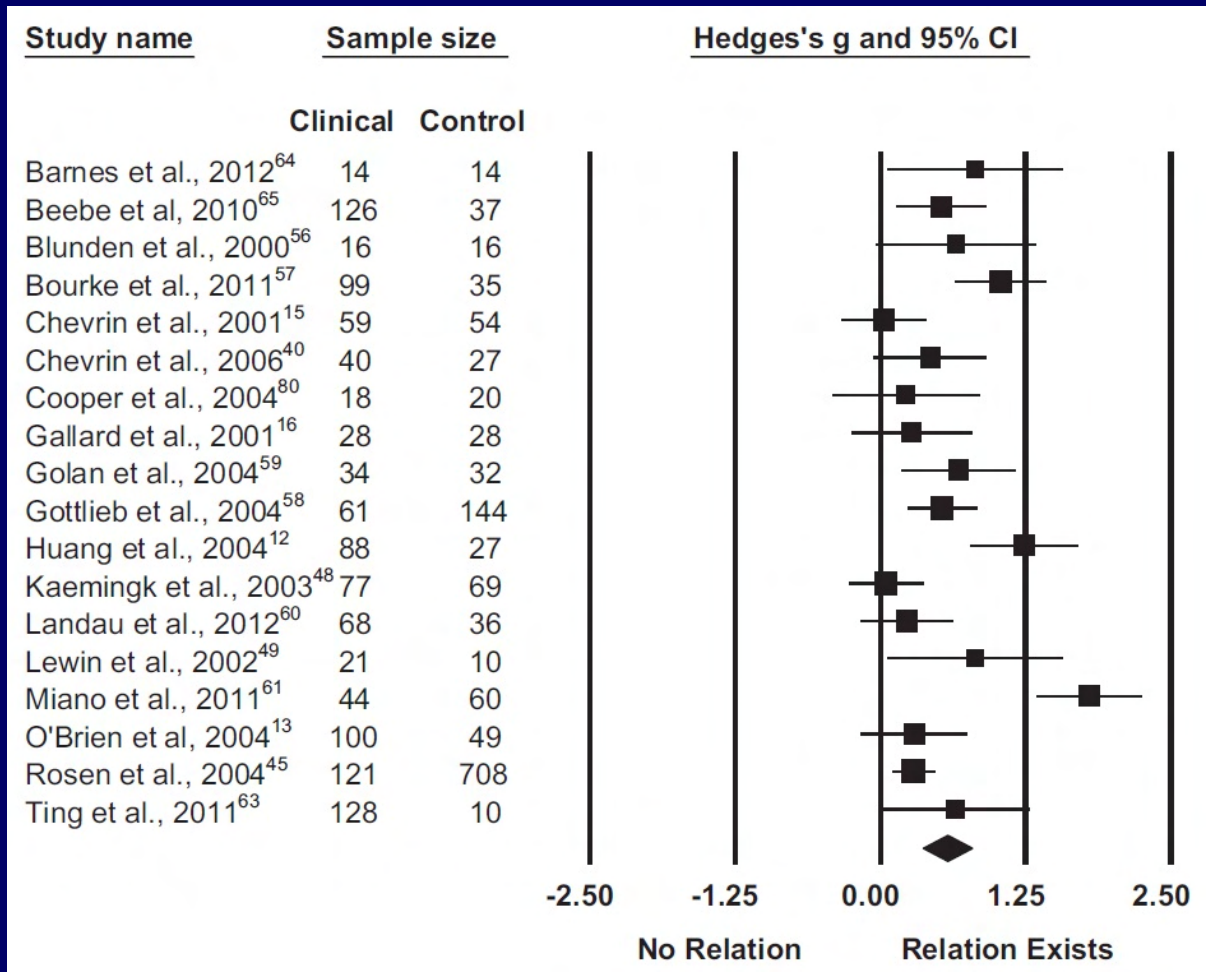
(Yao et al. *Biol Psychiatry*. 2019, Faraone & Larson, *Mol Psychiatry*. 2018 & 14 more sources)

Family, twin, and DNA studies show that genetic and environmental influences are partially shared between ADHD and many other psychiatric and somatic disorders.

ADHD & Sleep-Disordered Breathing (SDB)

(Sedky et al. *Sleep Medicine Reviews*. 2014)

A meta-analysis of 18 studies with more than 2,500 children and adolescents revealed that children suffering from SDB are at increased risk of presenting with symptoms of ADHD such as inattention and hyperactivity.

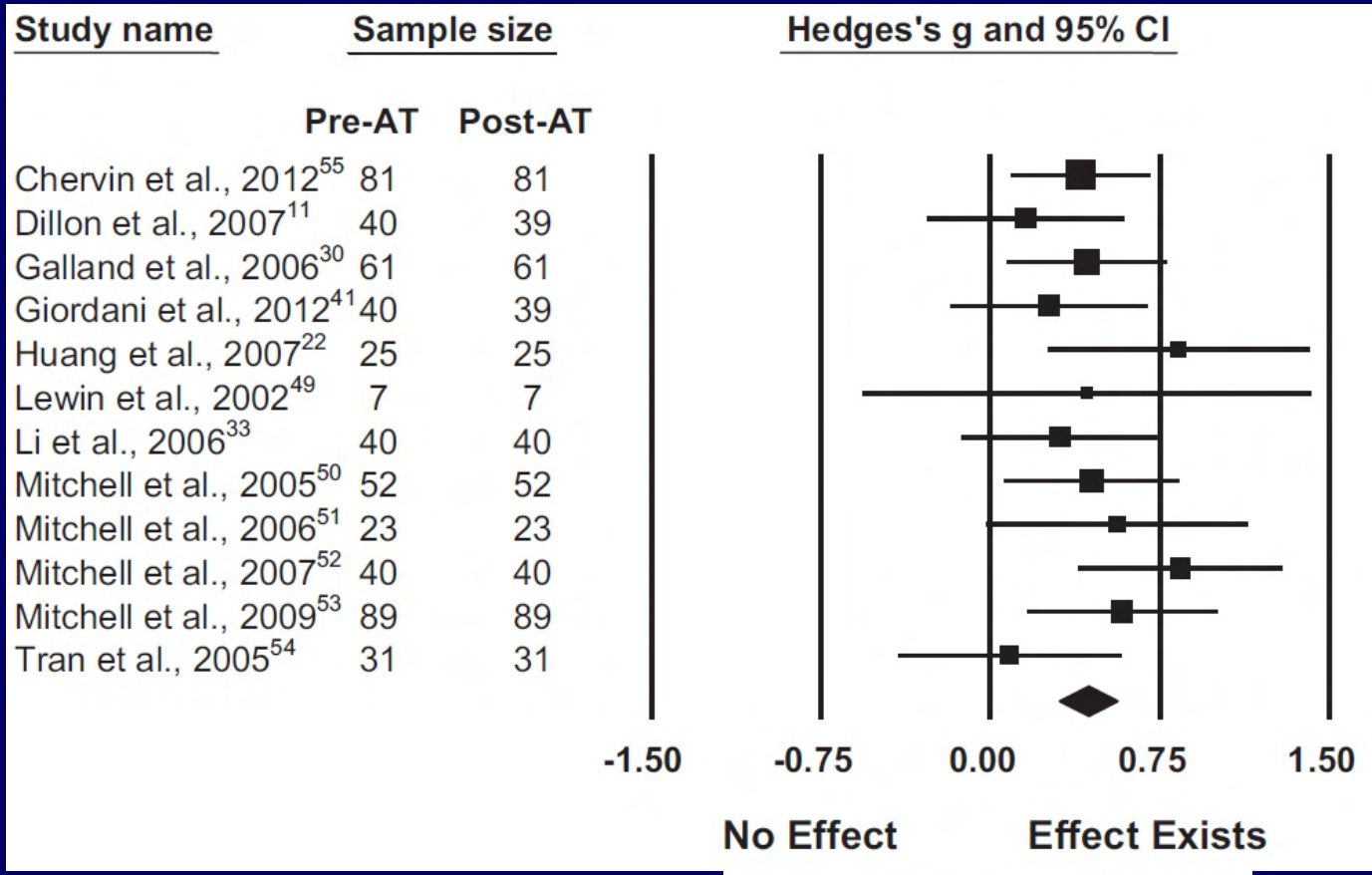


From www.ADHDevidence.org

ADHD & Sleep-Disordered Breathing (SDB)

(Sedky et al. *Sleep Medicine Reviews.* 2014)

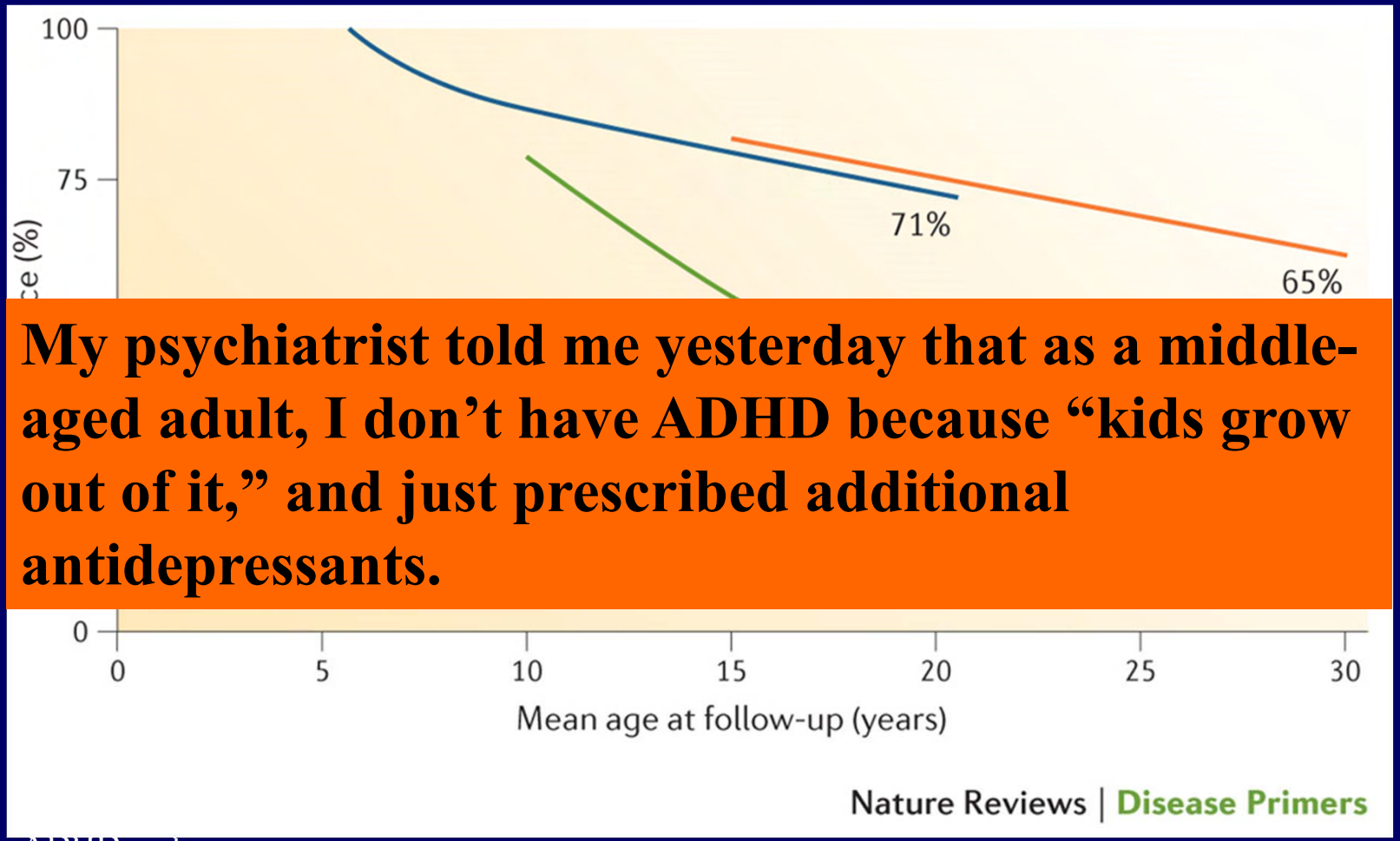
- Some forms of SDB can be treated by removing the adenoids and tonsils to relieve the obstruction to breathing
- Adenotonsillectomy (AT) reduces symptoms of ADHD with a standardized mean difference of 0.43.



From www.ADHDevidence.org

The Prevalence of ADHD Declines with Age

(Faraone, et al. Nature Reviews Disease Primers 2015)



My psychiatrist told me yesterday that as a middle-aged adult, I don't have ADHD because "kids grow out of it," and just prescribed additional antidepressants.

From www.ADHDevidence.org

Clinical Features Associated with ADHD

(Katusic et al. *J Dev Behav Pediatr*. 2011 & Rommelse et al. *Br J Psychiatry*. 2017)

ADHD impairs the functioning of highly intelligent people, so the disorder can be diagnosed in this group. A population-based birth cohort study of over 5,700 children found no significant differences among children with high, average, or low IQ and ADHD in median age at which ADHD criteria were met, rates of learning disorders, psychiatric disorders, and substance abuse, and rates of stimulant treatment.

Objective Tests Cleared by the US FDA for ADHD

The Test of Variables of Attention (T.O.V.A.®)

An FDA
normed

My father said this about my diagnosis"Your psychiatrist is rushing to the conclusion, I don't think you need medications, I think it is a problem of studying habits…. If it were a neurological problem, then why didn't your psychiatrist do a brainscan or something?

ADHD NEWS & RESEARCH

FDA-Cleared Diagnostic Tool May Improve Speed, Accuracy of ADHD Diagnoses, Study Finds

A randomized, controlled study found that a computerized tool called QbTest may make it easier for clinicians to accurately diagnose or rule out ADHD in fewer office visits.

No objective test can confirm or rule out the diagnosis of ADHD

From www.ADHDevidence.org

I went to a neurofeedback practitioner who gave me a handheld device with flashing lights to test for ADHD - I had to press a button for specific flashes. Because I did well on that task, she said I didn't have ADHD. But that type of task is not my problem, paperwork is my problem. She told me I have alpha ADD or Alpha wave ADD. Is there such a thing?

My doctor wants me to take a 20-minute QB test before diagnosis, but I am concerned that my test-taking aptitude will somehow muddle the results.

From www.ADHDevidence.org

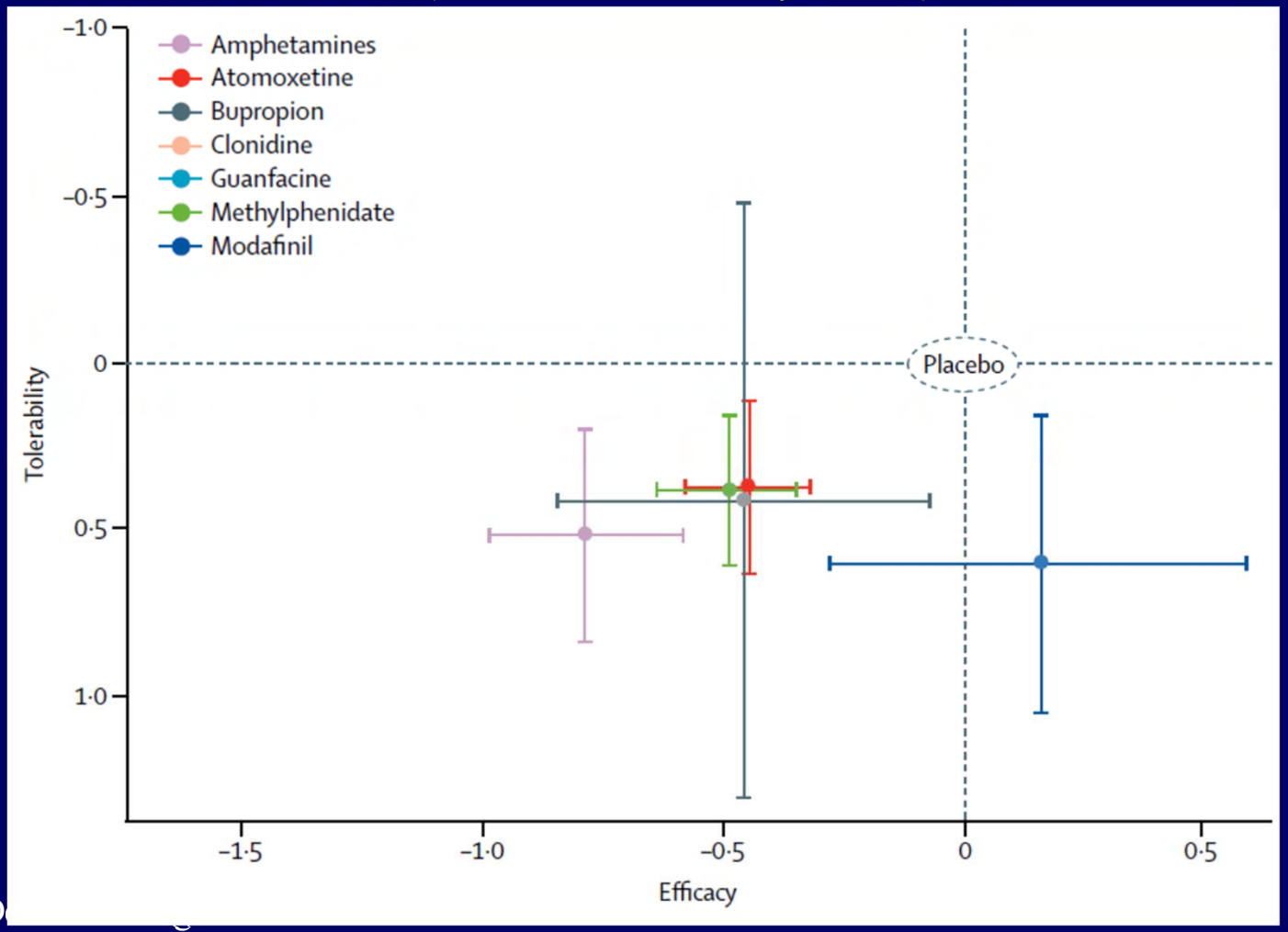
What Do[illegible]us About

Source: Anonymous Reddit user with ADHD

From www.ADHDevidence.org

Efficacy & Tolerability of ADHD Medications: Adults

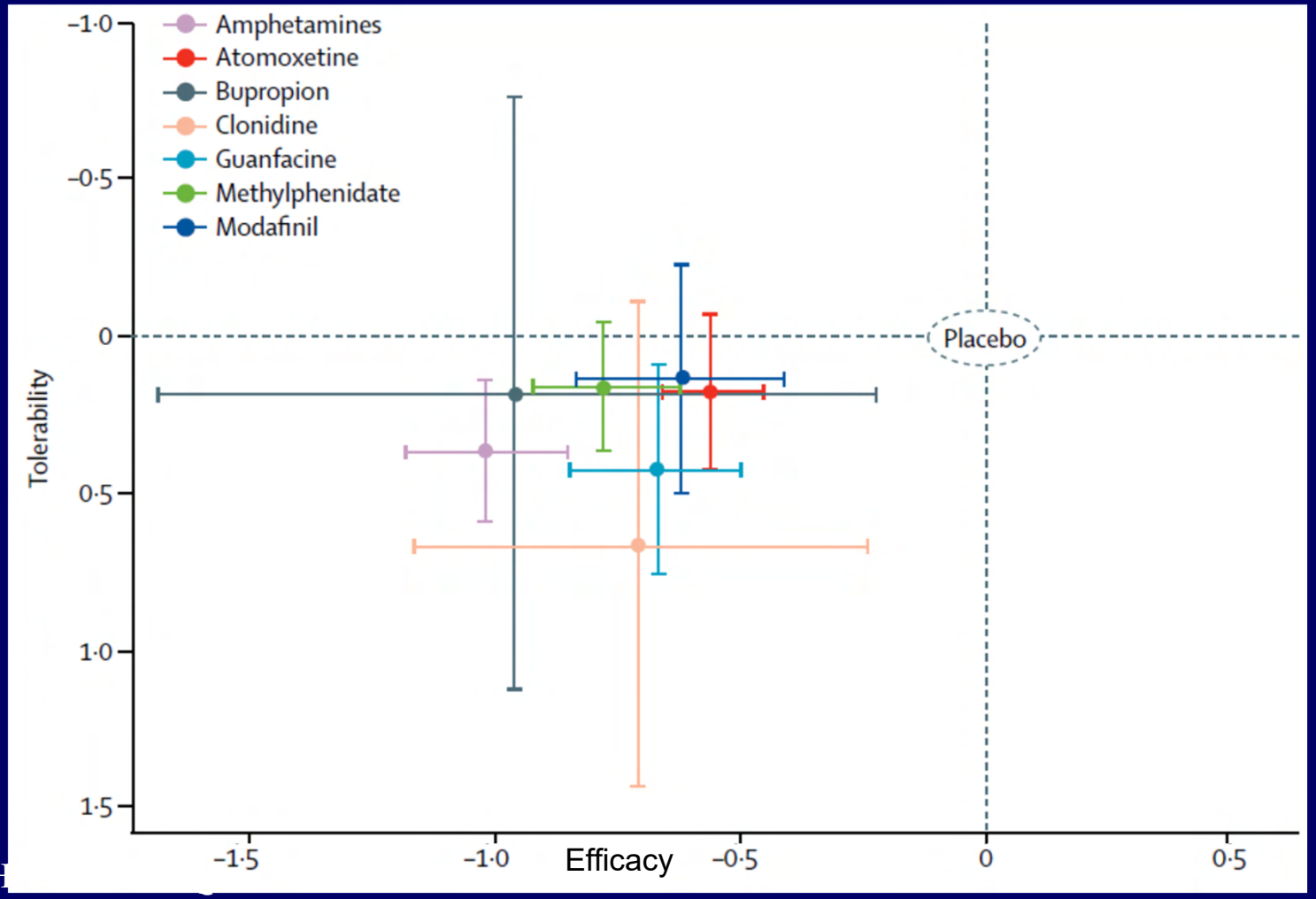
(Cortese et al. Lancet Psych, 2018)



From www.ADHD

Efficacy & Tolerability of ADHD Medications: Children & Adolescents

(Cortese et al. Lancet Psych, 2018)



From www.ADH

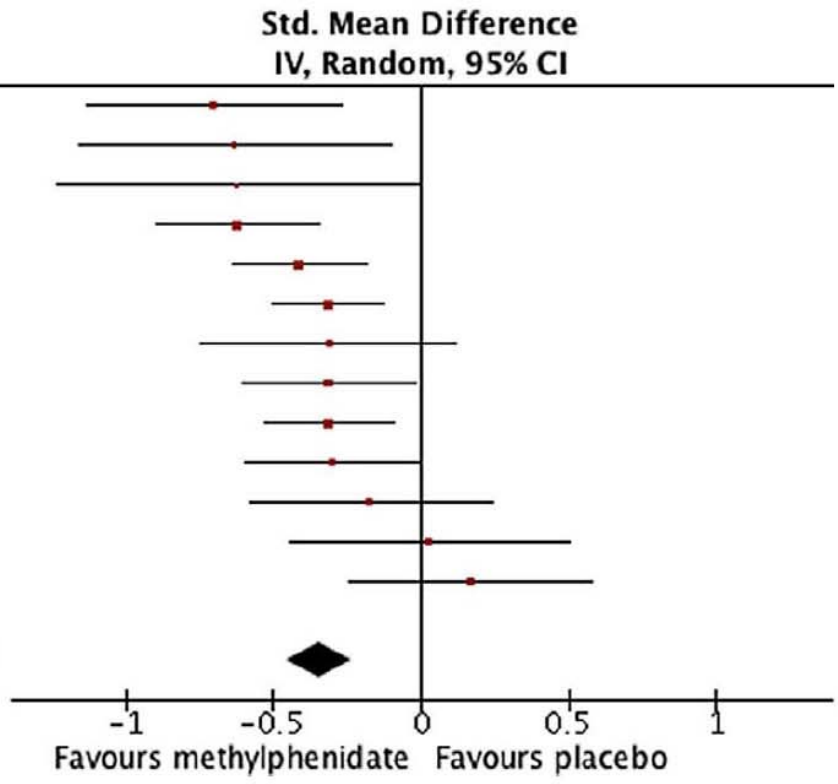
Methylphenidate Use & Emotional Dysregulation

(Lenzi et al. *Neuroscience & Biobehavioral Reviews*. 2018)

Study or Subgroup	Std. Mean Difference	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Reimherr 2007	-0.7	0.22	5.2%	-0.70 [-1.13, -0.27]
Wender 1985	-0.63	0.27	3.7%	-0.63 [-1.16, -0.10]
Marchant 2011	-0.62	0.31	3.0%	-0.62 [-1.23, -0.01]
Wender 2011	-0.62	0.14	9.8%	-0.62 [-0.89, -0.35]
Goodman 2017	-0.41	0.117	12.0%	-0.41 [-0.64, -0.18]
Medori 2008	-0.31	0.096	14.4%	-0.31 [-0.50, -0.12]
Jain 2007	-0.31	0.22	5.2%	-0.31 [-0.74, 0.12]
Retz 2012	-0.31	0.15	9.0%	-0.31 [-0.60, -0.02]
Rosler 2010	-0.31	0.11	12.7%	-0.31 [-0.53, -0.09]
Philipsen 2015	-0.3	0.15	9.0%	-0.30 [-0.59, -0.01]
Wigal 2016	-0.17	0.21	5.6%	-0.17 [-0.58, 0.24]
Tenenbauam 2002	0.03	0.24	4.6%	0.03 [-0.44, 0.50]
Biederman 2011	0.17	0.21	5.6%	0.17 [-0.24, 0.58]
Total (95% CI)			**100.0%**	**-0.34 [-0.45, -0.23]**

Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 18.23$, df = 12 (P = 0.11); $I^2 = 34\%$

Test for overall effect: Z = 6.03 (P < 0.00001)



From www.ADHDevidence.org

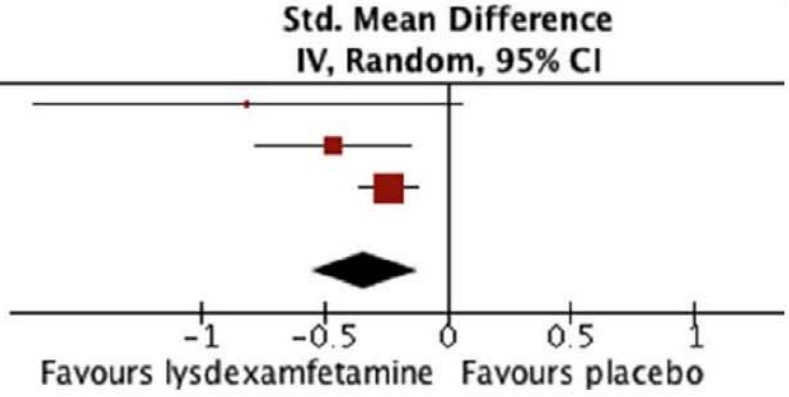
Lisdexamfetamine Use & Emotional Dysregulation

(Lenzi et al. *Neuroscience & Biobehavioral Reviews*. 2018)

Study or Subgroup	Std. Mean Difference	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Waxmonsky 2014	-0.81	0.44	5.7%	-0.81 [-1.67, 0.05]
Adler 2013	-0.46	0.16	29.6%	-0.46 [-0.77, -0.15]
DuPaul 2012	-0.24	0.06	64.7%	-0.24 [-0.36, -0.12]
Total (95% CI)			**100.0%**	**-0.34 [-0.55, -0.12]**

Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 3.16$, df = 2 (P = 0.21); $I^2 = 37\%$

Test for overall effect: Z = 3.09 (P = 0.002)



From www.ADHDevidence.org

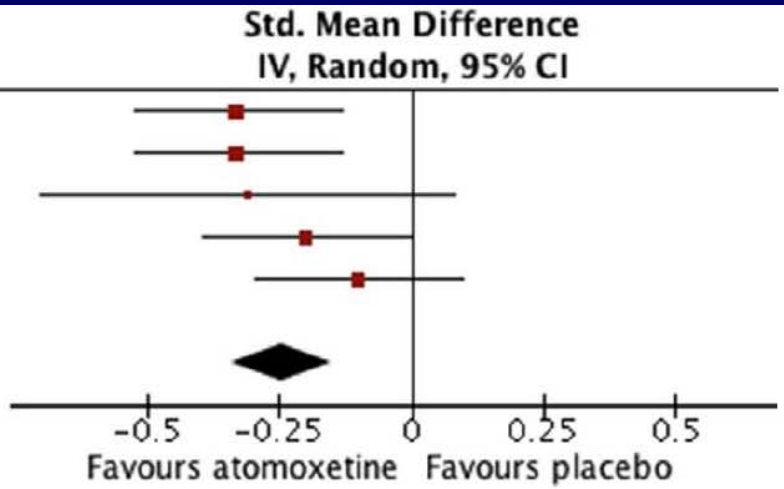
Atomoxetine Use & Emotional Dysregulation

(Lenzi et al. *Neuroscience & Biobehavioral Reviews*. 2018)

Study or Subgroup	Std. Mean Difference	SE	Weight	Std. Mean Difference IV, Random, 95% CI
Goto 2017	-0.33	0.1	23.5%	-0.33 [-0.53, -0.13]
Brown 2011	-0.33	0.1	23.5%	-0.33 [-0.53, -0.13]
Robison 2008	-0.31	0.2	5.9%	-0.31 [-0.70, 0.08]
Adler 2014b	-0.2	0.1	23.5%	-0.20 [-0.40, -0.00]
Adler 2014a	-0.1	0.1	23.5%	-0.10 [-0.30, 0.10]
Total (95% CI)			**100.0%**	**-0.24 [-0.34, -0.15]**

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 3.86$, df = 4 (P = 0.43); $I^2 = 0\%$

Test for overall effect: Z = 5.03 (P < 0.00001)



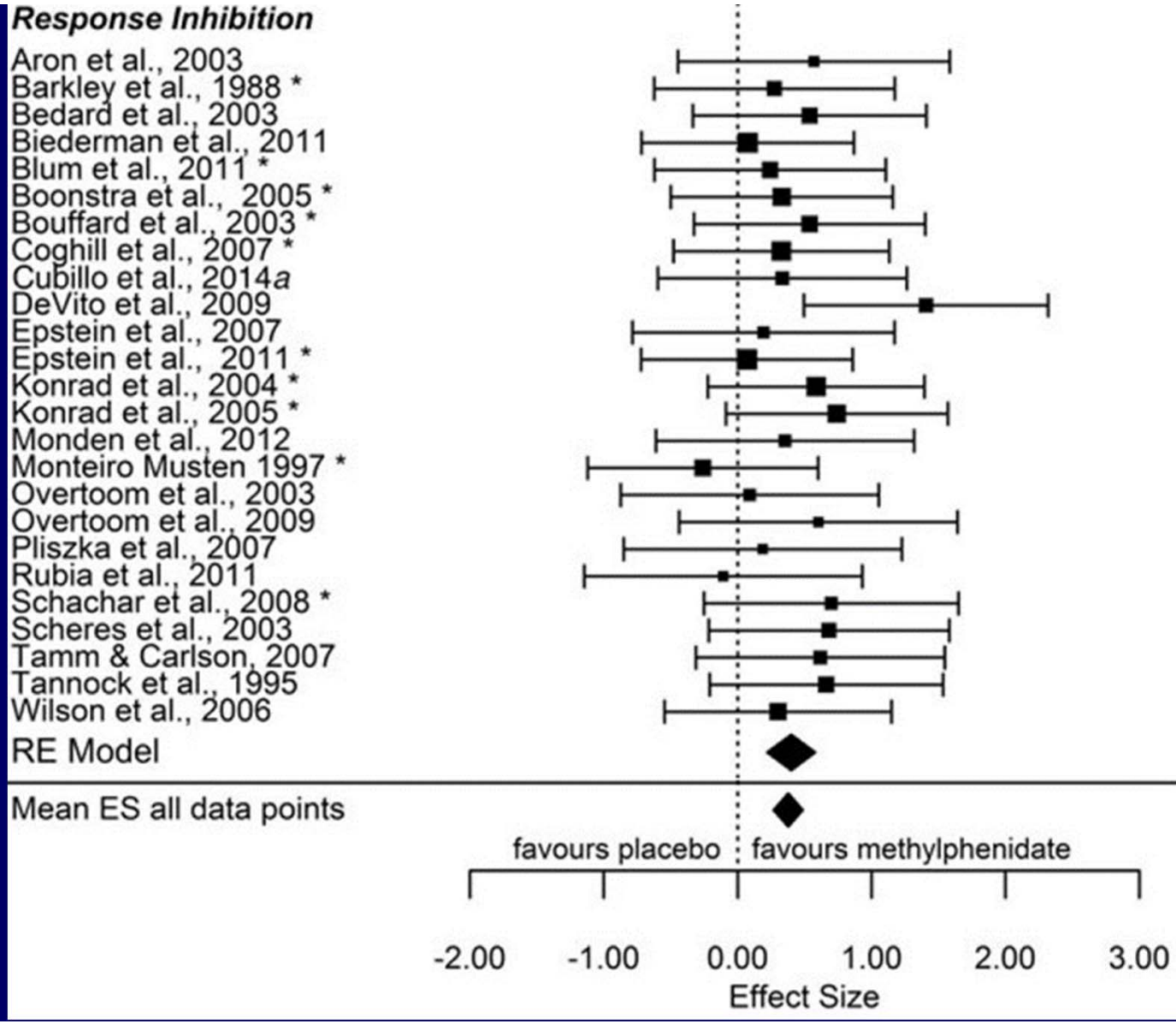
From www.ADHDevidence.org

Methylphenidate Use & Effects on Executive Functioning

(Tamminga et al. Psychol Med. 2016)

A meta-analysis of methylphenidate treatment for ADHD found moderate improvements in response inhibition (25 studies, 787 participants).

From www.ADHDevidence.org

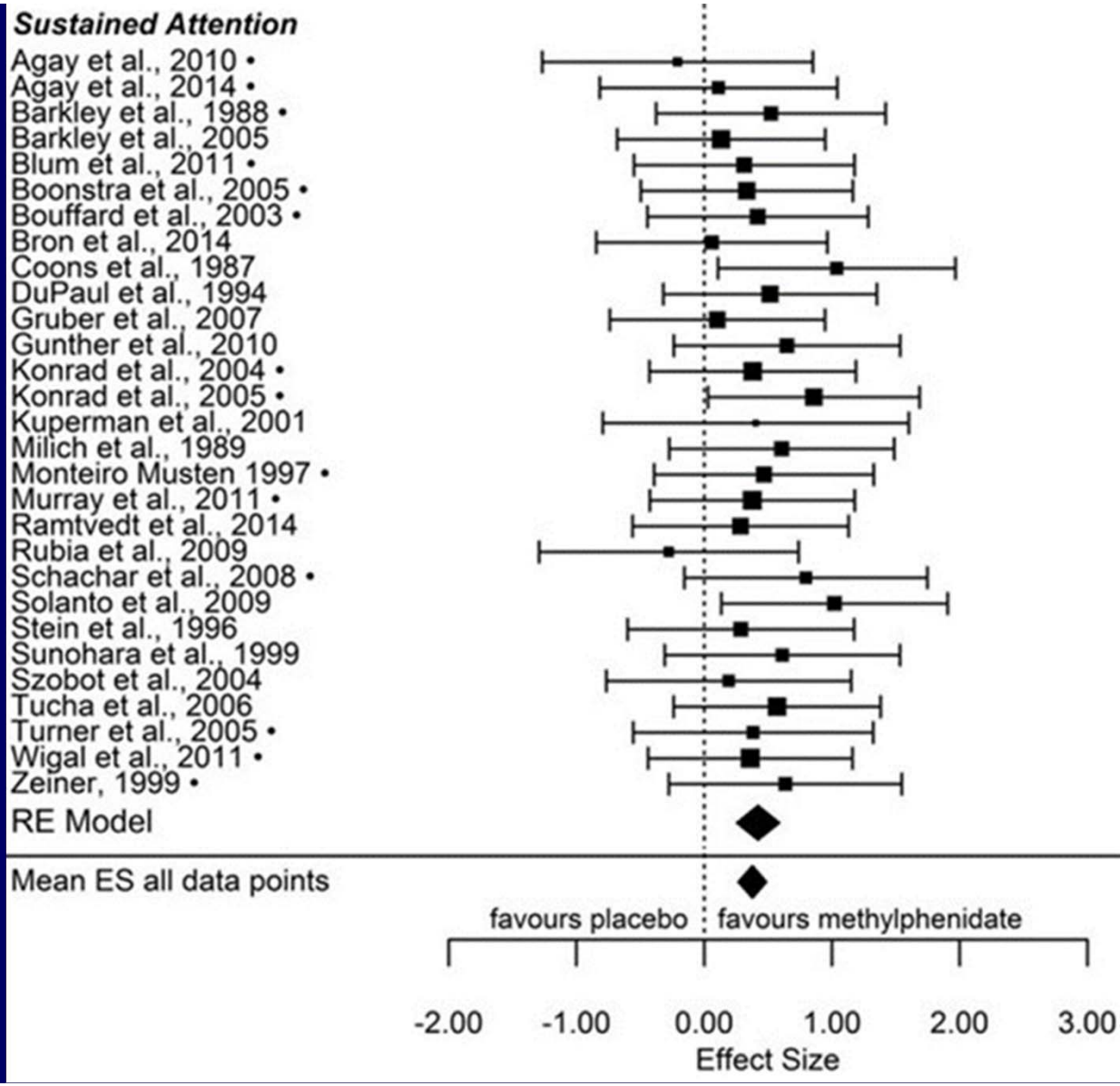


Methylphenidate Use & Effects on Executive Functioning

(Tamminga et al. Psychol Med. 2016)

Same study also found moderate improvements in sustained attention (29 studies, 956 participants).

From www.ADHDevidence.org

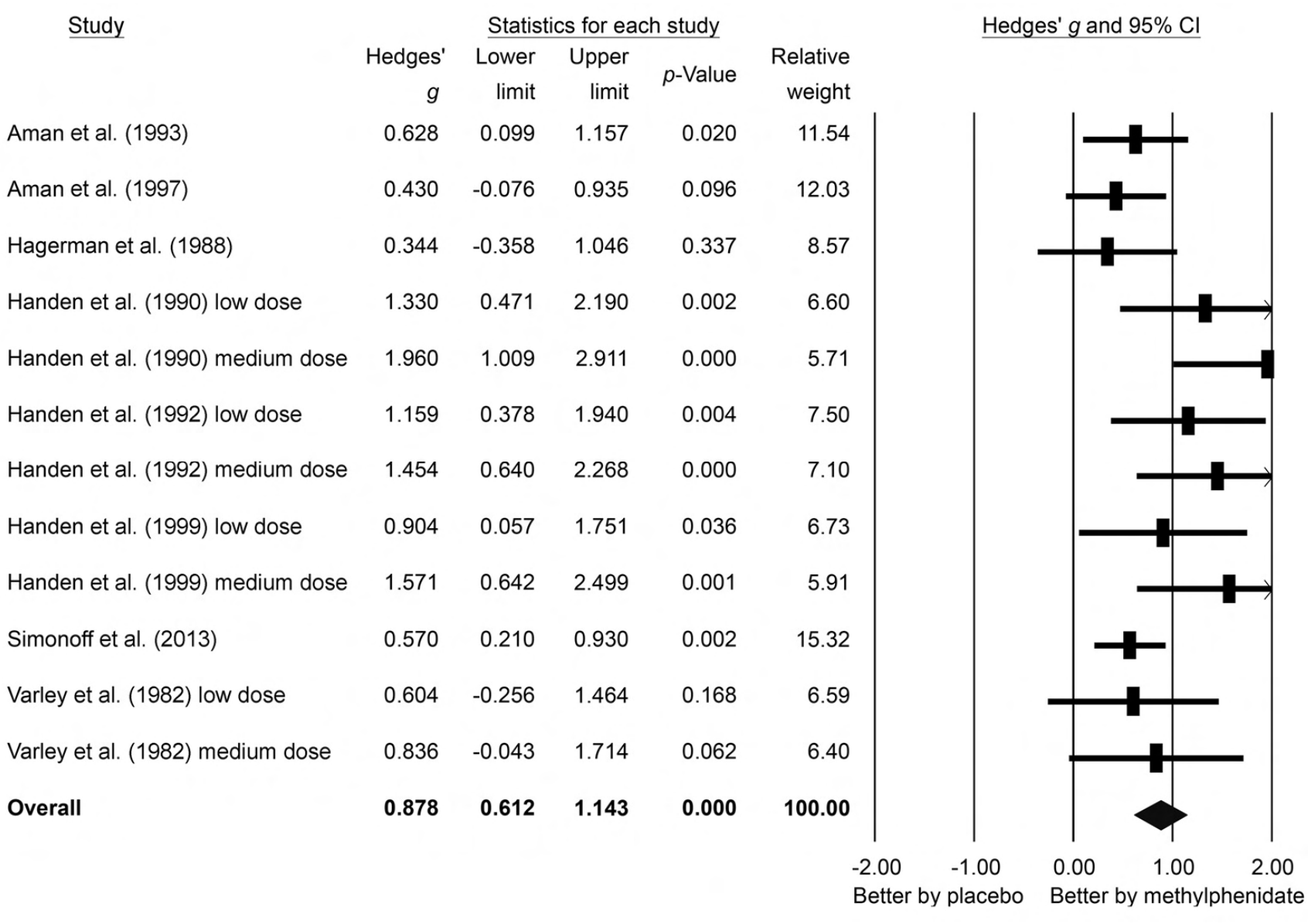


Methylphenidate Use & Intellectual Disability

(Sun et al. *Sci Rep*. 2019)

A meta-analysis reported moderate-to-strong improvements in ADHD symptoms with methylphenidate in ADHD patients with borderline intellectual functioning or intellectual disability (8 studies, 423 children).

Graph in the next slide.


Study
Statistics for each study
Hedges' g and 95% CI
Hedges' g
Lower limit
Upper limit
p-Value
Relative weight
Aman et al. (1993) 0.628 0.099 1.157 0.020 11.54
Aman et al. (1997) 0.430 -0.076 0.935 0.096 12.03
Hagerman et al. (1988) 0.344 -0.358 1.046 0.337 8.57
Handen et al. (1990) low dose 1.330 0.471 2.190 0.002 6.60
Handen et al. (1990) medium dose 1.960 1.009 2.911 0.000 5.71
Handen et al. (1992) low dose 1.159 0.378 1.940 0.004 7.50
Handen et al. (1992) medium dose 1.454 0.640 2.268 0.000 7.10
Handen et al. (1999) low dose 0.904 0.057 1.751 0.036 6.73
Handen et al. (1999) medium dose 1.571 0.642 2.499 0.001 5.91
Simonoff et al. (2013) 0.570 0.210 0.930 0.002 15.32
Varley et al. (1982) low dose 0.604 -0.256 1.464 0.168 6.59
Varley et al. (1982) medium dose 0.836 -0.043 1.714 0.062 6.40
Overall 0.878 0.612 1.143 0.000 100.00
-2.00
-1.00
0.00
1.00
2.00
Better by placebo
Better by methylphenidate

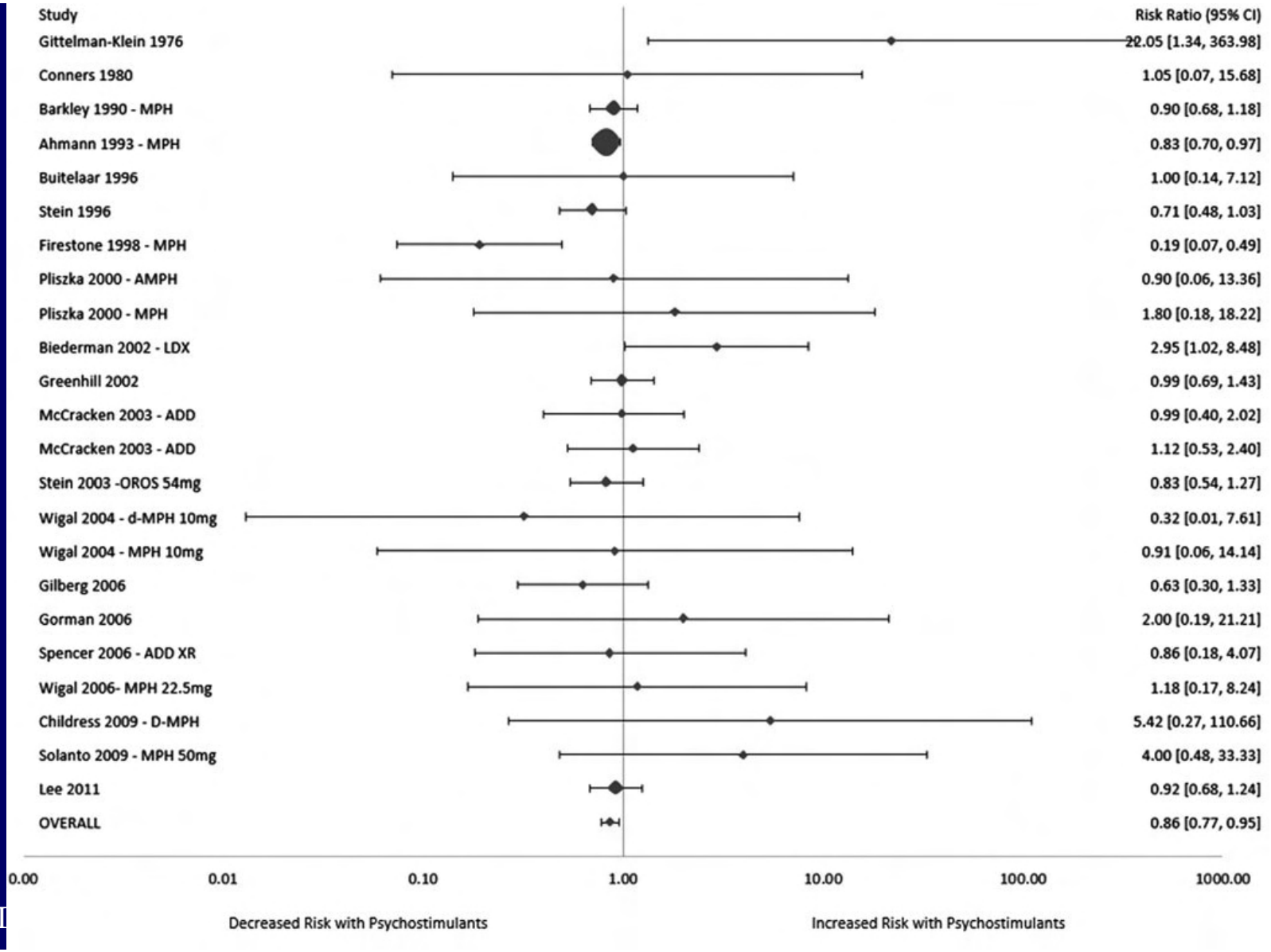
From www

Psychostimulant Use & Risk of Anxiety

(Coughlin et al. *J Child Adolesc Psychopharmacol*. 2015)

A meta-analysis of 23 studies with over 2,900 children with ADHD reported that stimulant medications reduced anxiety by 14% relative to placebo (Coughlin et al., 2015).

Graph in the next slide.


Study
Risk Ratio (95% CI)
Gittelman-Klein 1976
22.05 [1.34, 363.98]
Conners 1980
1.05 [0.07, 15.68]
Barkley 1990 - MPH
0.90 [0.68, 1.18]
Ahmann 1993 - MPH
0.83 [0.70, 0.97]
Buitelaar 1996
1.00 [0.14, 7.12]
Stein 1996
0.71 [0.48, 1.03]
Firestone 1998 - MPH
0.19 [0.07, 0.49]
Pliszka 2000 - AMPH
0.90 [0.06, 13.36]
Pliszka 2000 - MPH
1.80 [0.18, 18.22]
Biederman 2002 - LDX
2.95 [1.02, 8.48]
Greenhill 2002
0.99 [0.69, 1.43]
McCracken 2003 - ADD
0.99 [0.40, 2.02]
McCracken 2003 - ADD
1.12 [0.53, 2.40]
Stein 2003 -OROS 54mg
0.83 [0.54, 1.27]
Wigal 2004 - d-MPH 10mg
0.32 [0.01, 7.61]
Wigal 2004 - MPH 10mg
0.91 [0.06, 14.14]
Gilberg 2006
0.63 [0.30, 1.33]
Gorman 2006
2.00 [0.19, 21.21]
Spencer 2006 - ADD XR
0.86 [0.18, 4.07]
Wigal 2006- MPH 22.5mg
1.18 [0.17, 8.24]
Childress 2009 - D-MPH
5.42 [0.27, 110.66]
Solanto 2009 - MPH 50mg
4.00 [0.48, 33.33]
Lee 2011
0.92 [0.68, 1.24]
OVERALL
0.86 [0.77, 0.95]
0.00
0.01
0.10
1.00
10.00
100.00
1000.00
Decreased Risk with Psychostimulants
Increased Risk with Psychostimulants

Stimulants Use & Disruptive Behavior Disorders

(Pringsheim et al. *Can J Psychiatry*. 2015)

A meta-analysis of nine studies with over 1,300 participants found stimulants to be effective in reducing aggression, oppositional behavior, and conduct problems in youth with ADHD (with and without oppositional defiant disorder) and conduct disorder, as measured by teachers, and moderately effective as measured by parents.

From www.ADHDevidence.org

Medication Effects on Real World Outcomes

Treatment with ADHD medications reduces:

- Accidental injuries & Bone fractures
- Motor vehicle crashes
- Traumatic brain injury
- Burn injuries
- Emergency room admissions
- Suicide
- Premature death
- Criminality
- Depression
- Drug and alcohol abuse
- Cigarette smoking
- Educational underachievement
- Teenage pregnancy
- Sexually transmitted infections

From www.ADHDevidence.org

ADHD Medications and Stigma

“My psychiatrist agreed that I had ADHD and gave me a trial of Ritalin and Strattera, but my mother was so against “giving her kid meth” and told me I embarrassed her by looking like a drug seeker”

From www.ADHDevidence.org

Non-Medical Use of Prescribed Stimulants

(Faraone et al. *J Am Acad Child Adolesc Psychiatry*. 2019)

- A systematic review of 109 studies concluded:
- Non-medical use (NMU) of prescribed stimulants is a significant public health problem especially in young adults.
- Oral NMU is associated with no, or minor, medical effects
- Adverse medical outcomes, including death, occur in some individuals, particularly when administered by non-oral routes.
- Academic and occupational performance enhancement were the most commonly cited motivations for non-medical use of stimulants.

“I talked to my psychiatrist, and he said there hasn't been much research done on how taking medication for life affects the brain. This is honestly my biggest barrier to taking medication.”

From www.ADHDevidence.org

ADHD Medications do not Cause Structural MRI Associations

(Hoogman et al. *Am J Psychiatry*. 2019)

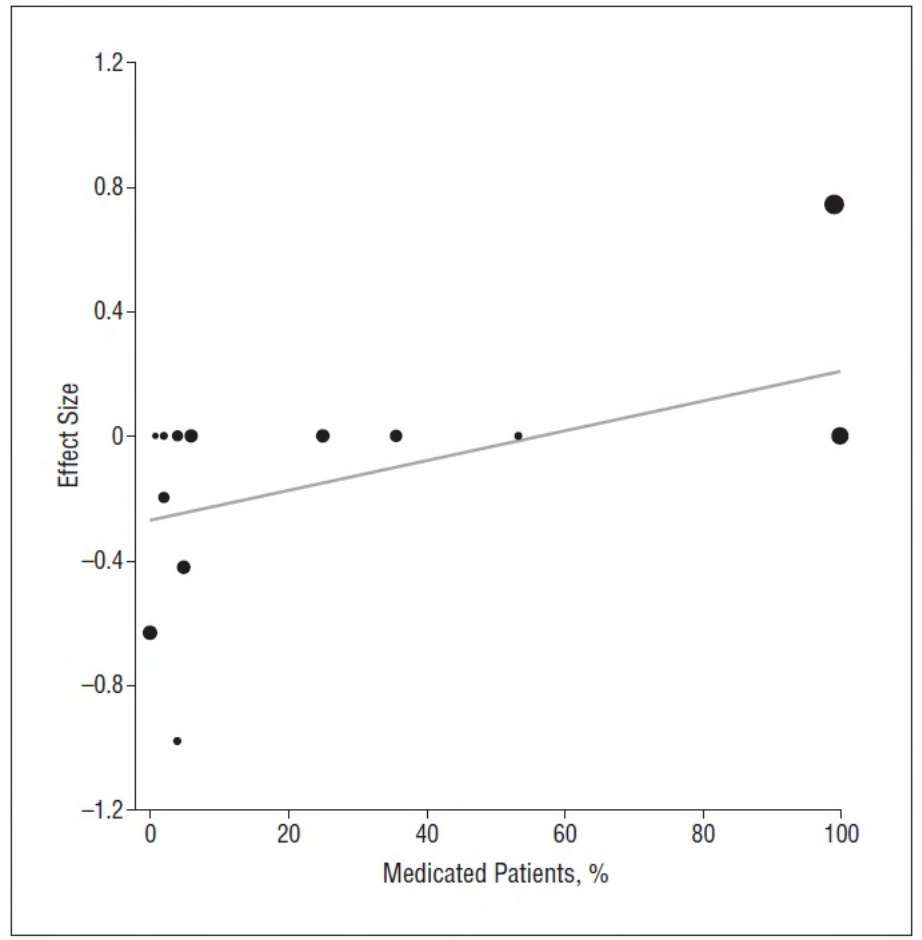
	Currently not taking stimulants*				Stimulant use in patients with ADHD		
	Cases (n=799)	Controls (n=1529)	Cohen's *d* (95% CI)	p value for diagnosis	Never stimulant use (n=82)	Ever stimulant use (n=637)	p value for positive *vs* negative for lifetime stimulant use
Accumbens	776	1484	−0·12 (−0·21 to −0·03)	0·0069	79	625	0·32
Amygdala	753	1474	−0·18 (−0·27 to −0·10)	>0·0001	80	590	0·41
Caudate	777	1502	−0·10 (−0·19 to −0·01)	0·0248	80	627	0·15
Hippocampus	757	1446	−0·08 (−0·17 to 0·003)	0·063	80	593	0·69
Pallidum	776	1484	0·01 (−0·07 to 0·10)	0·74	79	621	0·26
Putamen	784	1508	−0·13 (−0·22 to −0·04)	0·0037	81	627	0·29
Thalamus	692	1253	−0·03 (0·04 to −0·12)	0·53	80	458	0·29
Intracranial volume	793	1512	−0·06 (0·04 to −0·16)	0·15	81	632	0·92

*Within this group, 152 patients were lifetime positive for the use of stimulant medication, 82 were lifetime negative; for 565 participants no lifetime information was available.

Table 4: **Results of the exploration of the effect of medication on case-control differences**

Stimulant Treatment is Associated with more Typical Activation

(Hart et al. *JAMA Psychiatry*. 2013)



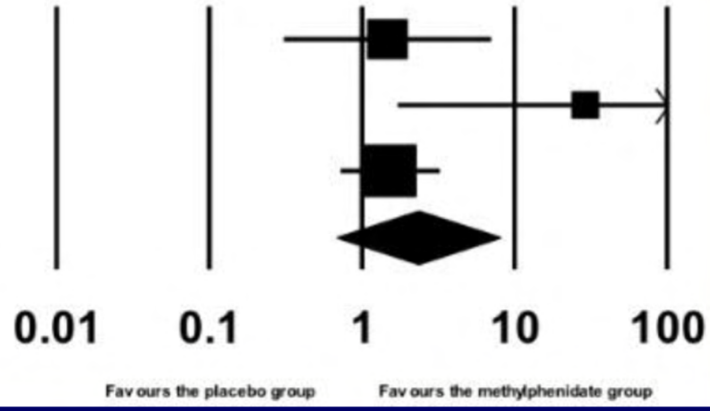
From www.ADHDevidence.org

ADHD Medication & Cardiovascular Events

(Liang et al. *Int J Environ Res Public Health*. 2018)

A meta-analysis of three studies with 775 adults found no significant difference in adverse cardiac events between methylphenidate and placebo.

Study name	Odds ratio	Lower limit	Upper limit	Z-Value	p-Value
Spencer et al.	1.471	0.308	7.032	0.484	0.629
Medori et al.	29.112	1.705	496.920	2.329	0.020
Rosler et al.	1.536	0.724	3.258	1.117	0.264
	2.325	0.684	7.910	1.351	0.177



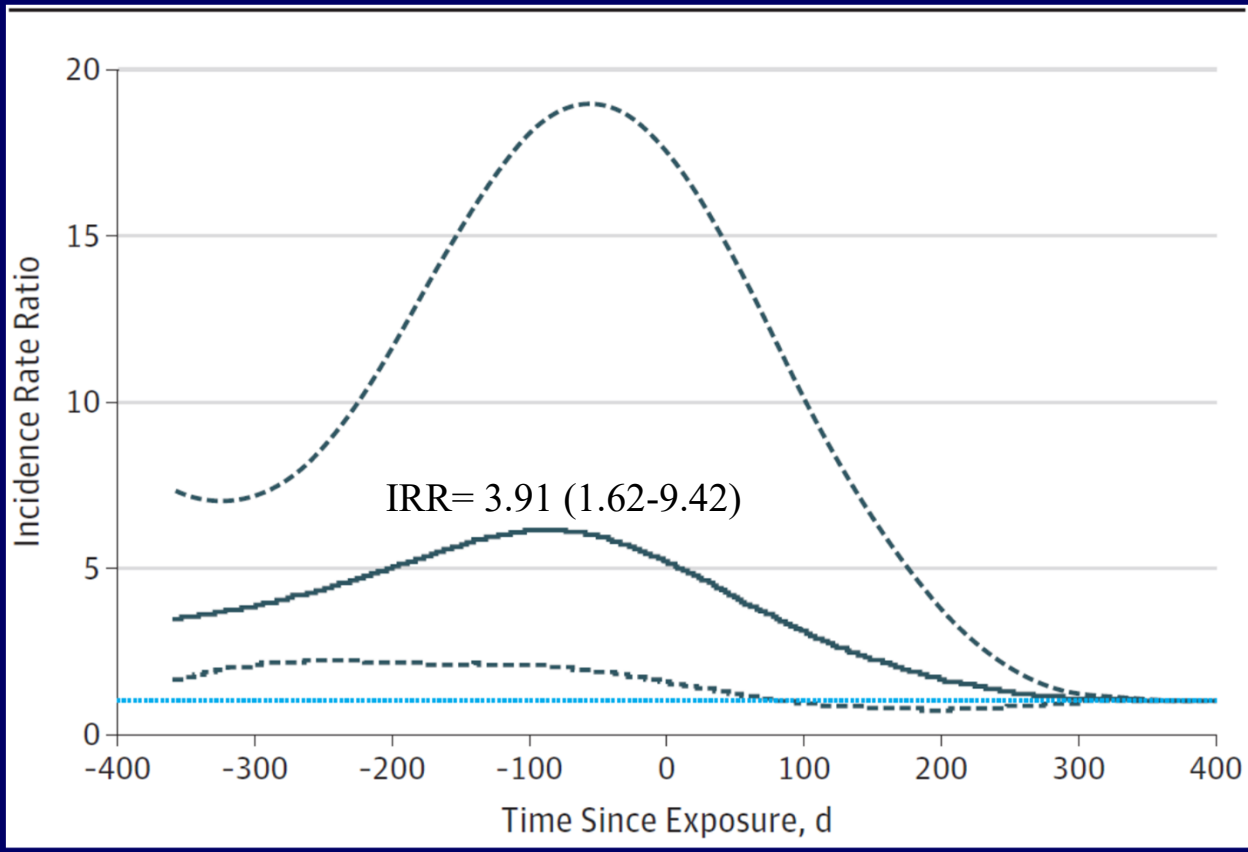
From www.ADHDevidence.org

Methylphenidate Use & Suicide Attempts

(Man et al. *JAMA Psychiatry. 2017*)

The Hong Kong Clinical Data Analysis & Reporting System, a population-based, electronic medical records database, was used to examine over 25,000 persons receiving methylphenidate for ADHD. During the 90-day period prior to initiation of treatment, individuals with ADHD were greater than six times more likely to attempt suicide than after treatment. After ongoing treatment, the risk for attempted suicide was no longer elevated.

From www.ADHDevidence.org



The solid line is the estimated IRR, the dashed lines indicate the 95%CI, and the blue dashed line indicates baseline.

Methylphenidate Use & Psychotic Episodes

(Man et al. *Transl Psychiatry. 2016*)

Using the same Hong Kong database, risk for psychosis did not differ between periods when patients were on and off methylphenidate treatment.

	IRR	*95% CI*	*P-value*
Incident psychotic episode (n = 103)			
Period with MPH treatment	0.98	0.52–1.86	0.95
Pre-risk period included			
90 Days before first MPH treatment	4.64	2.17–9.92	< 0.01
Period with MPH treatment	1.02	0.53–1.97	0.95

From www.ADHDevidence.org

Methylphenidate Use & Psychotic Events

(Hollis et al. *The Lancet Psychiatry. 2019*)

A Swedish registry study of over 23,000 adolescents and young adults treated with methylphenidate for ADHD found no evidence of an increased risk of psychotic events due to methylphenidate treatment. A year after initiation of methylphenidate treatment, there was a 36% reduction in the incidence of psychotic events in those with a history of psychosis and an 18% reduction in incidence in those without a history of psychosis relative to the period immediately before initiation.

Which Non-Medication Treatments are Safe and Effective for ADHD

From www.ADHDevidence.org

Which Non-Medication Treatments are Safe and Effective for ADHD

- Behavioral and Cognitive-Behavioral Therapies
- Computer-based Cognitive Training and Neurofeedback
- Supplements, Diet, and Exercise

From www.ADHDevidence.org

ADHD & Parent Training: Assessment Methods

(Rimestad et al. *J Atten Disord*. 2019)

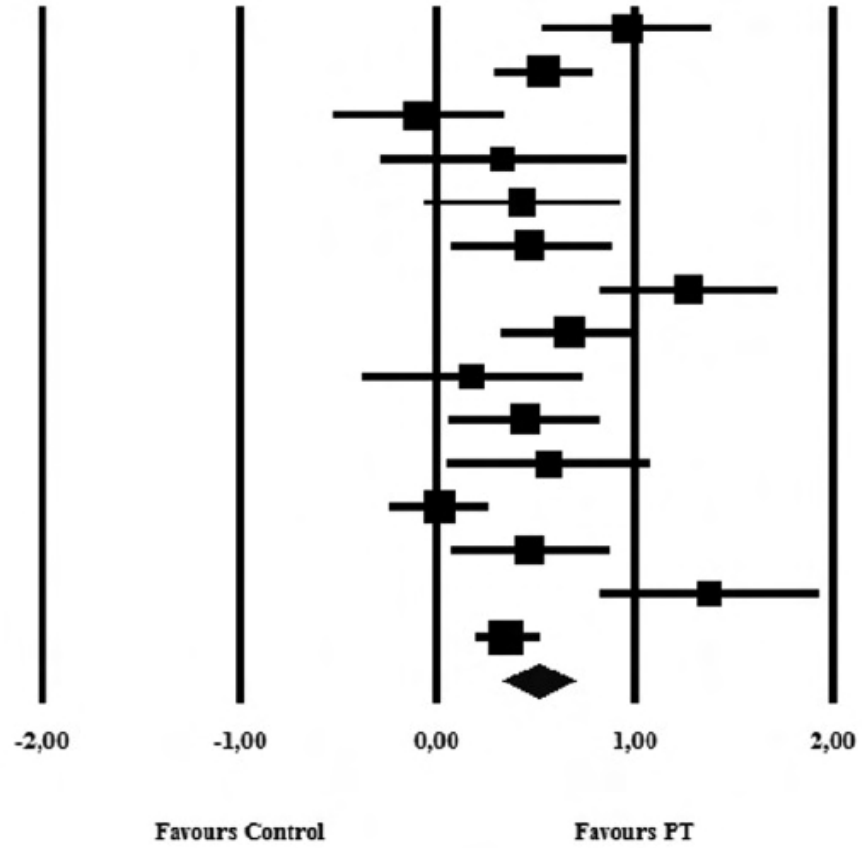
- Parents assess symptoms of ADHD
  - This is a flawed method because parents know which treatment their child is receiving
- An independent assessor blind to treatment group assesses symptoms of ADHD
  - This is the gold standard because assessments cannot be biased

Graphics in next six slides.

Parental Report of ADHD

(Rimestad et al. *J Atten Disord*. 2019)

First study author	Hedges's g	p-Value
Abikoff (2015)	0,960	0,000
Azevedo (2013)	0,536	0,000
Barkley (2000)	-0,096	0,662
Bor(2002)	0,334	0,293
Herbert (2013)	0,426	0,094
Jones (2007)	0,470	0,023
Matos (2009)	1,270	0,000
McGilloway (2012)	0,669	0,000
McGoey(2005)	0,177	0,538
Scott (2010)	0,441	0,025
Sonuga-Barke (2001)	0,560	0,034
Sonuga-Barke (2004)	0,008	0,952
Strayhorn(1989)	0,467	0,024
Thompson (2009)	1,377	0,000
Webster-Stratton (2011)	0,351	0,000
	0,512	0,000

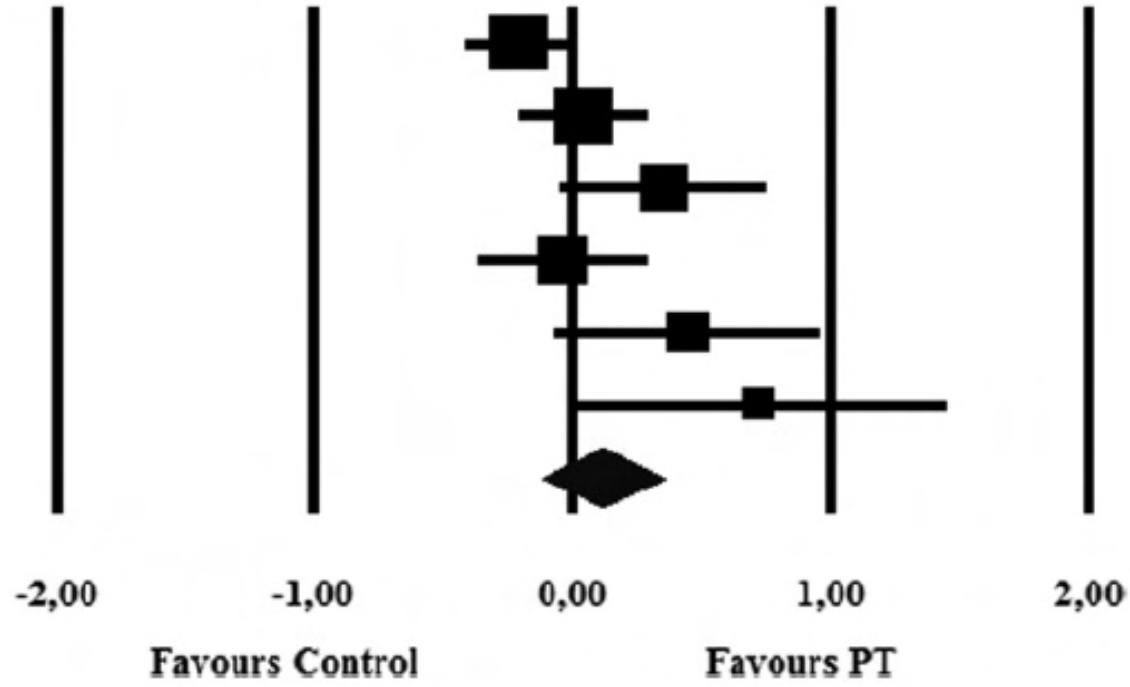


From www.ADHDevidence.org

Independent Assessment of ADHD

(Rimestad et al. *J Atten Disord*. 2019)

First study author	Hedges's g	p-Value
Abikoff (2015)	-0,212	0,043
Barkley (2000)	0,043	0,736
McGoey(2005)	0,353	0,084
Pisterman (1992)	-0,040	0,814
Sonuga-Barke (2001)	0,449	0,087
Thompson (2009)	0,721	0,051
	0,120	0,325

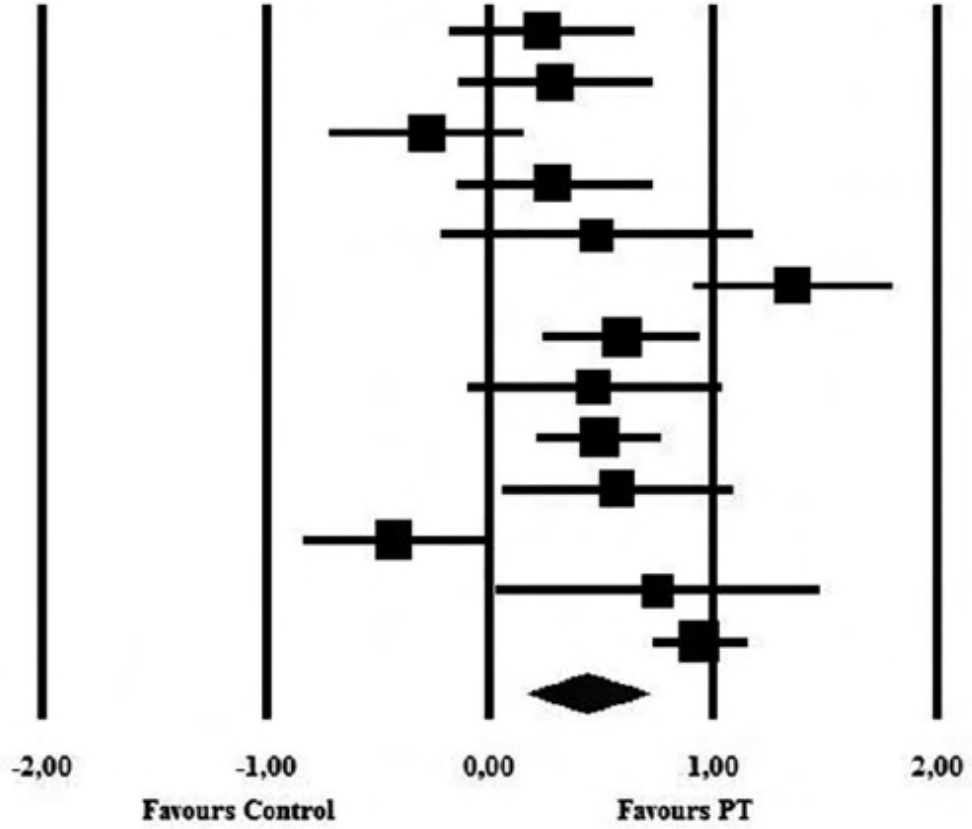


From www.ADHDevidence.org

Parental Report of Conduct Problems

(Rimestad et al. *J Atten Disord*. 2019)

First study author	Hedges's g	p-Value
Abikoff (2015)	0,237	0,262
Azevedo (2013)	0,292	0,184
Barkley (2000)	-0,283	0,201
Bor(2002)	0,287	0,201
Herbert (2013)	0,477	0,181
Matos (2009)	1,354	0,000
McGilloway (2012)	0,591	0,001
McGoey(2005)	0,465	0,109
Scott (2010)	0,491	0,000
Sonuga-Barke (2001)	0,572	0,031
Strayhorn(1989)	-0,428	0,038
Thompson (2009)	0,750	0,043
Webster-Stratton (2011)	0,938	0,000
	0,439	0,001

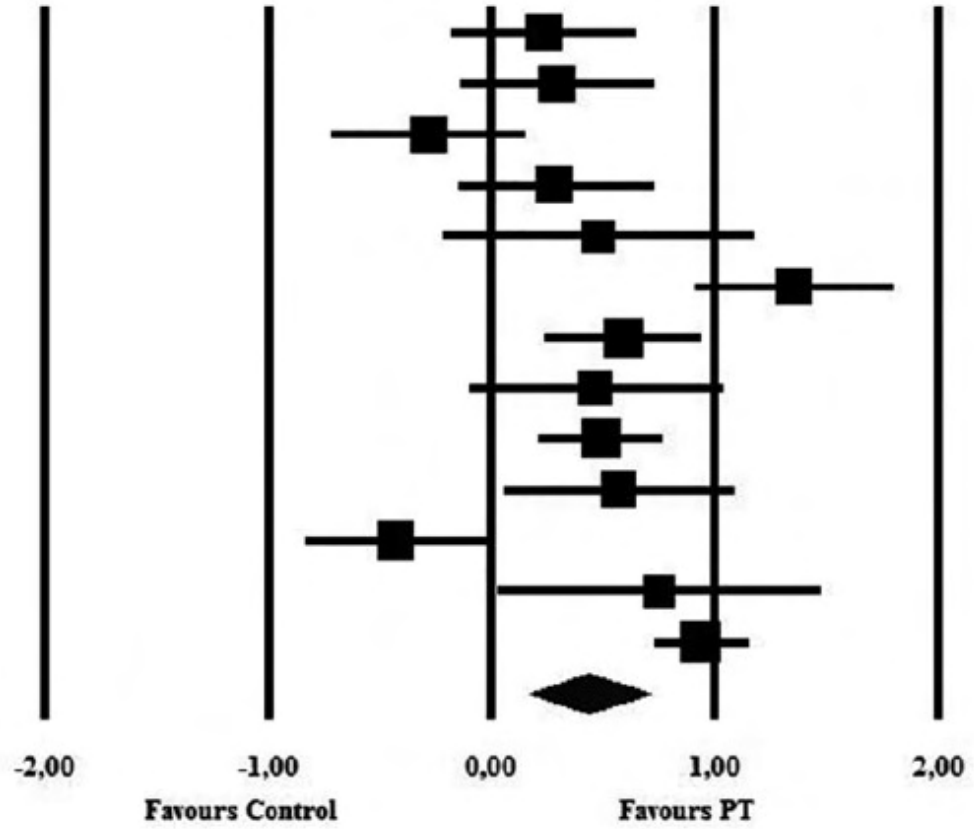


From ww

Independent Assessment of Conduct Problems

(Rimestad et al. *J Atten Disord*. 2019)

First study author	Hedges's g	p-Value
Abikoff (2015)	0,237	0,262
Azevedo (2013)	0,292	0,184
Barkley (2000)	-0,283	0,201
Bor(2002)	0,287	0,201
Herbert (2013)	0,477	0,181
Matos (2009)	1,354	0,000
McGilloway (2012)	0,591	0,001
McGoey(2005)	0,465	0,109
Scott (2010)	0,491	0,000
Sonuga-Barke (2001)	0,572	0,031
Strayhorn(1989)	-0,428	0,038
Thompson (2009)	0,750	0,043
Webster-Stratton (2011)	0,938	0,000
	0,439	0,001

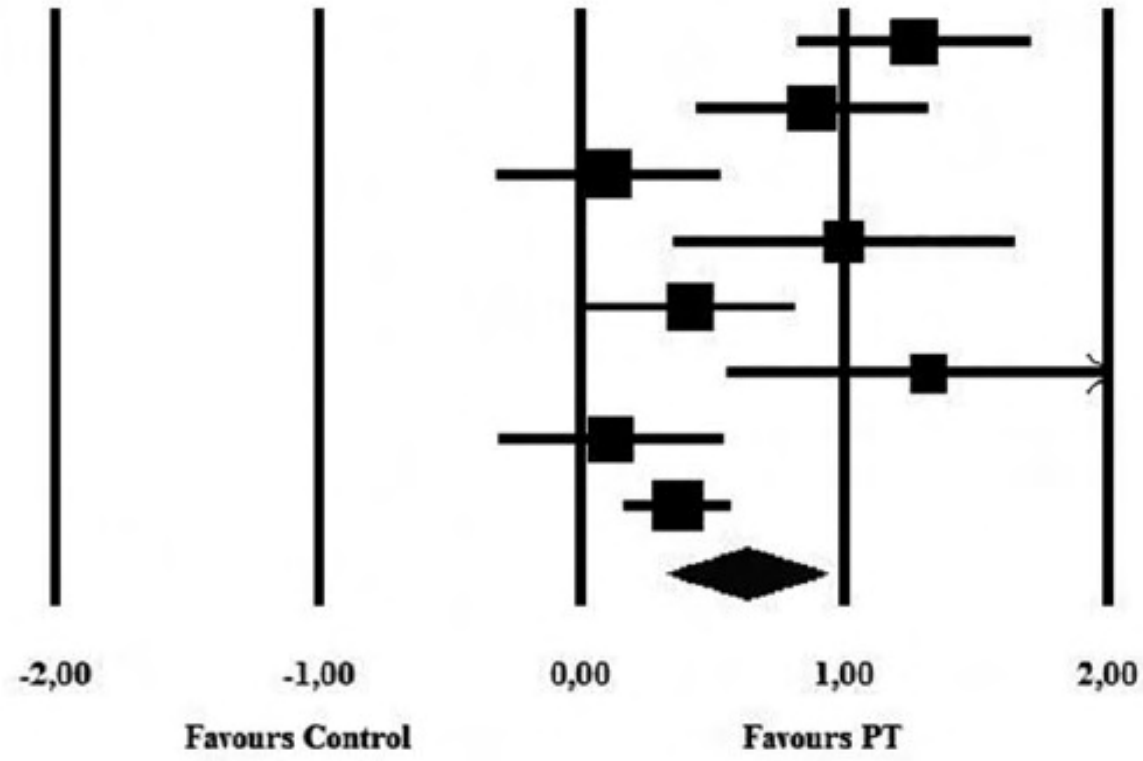


From ww

Parental Report of Negative Parenting

(Rimestad et al. *J Atten Disord*. 2019)

First study author	Hedges's g	p-Value
Abikoff (2015)	1,266	0,000
Azevedo (2013)	0,877	0,000
Barkley (2000)	0,103	0,640
Bor(2002)	0,999	0,003
Herbert (2013)	0,414	0,044
Matos (2009)	1,321	0,001
Scott (2010)	0,115	0,598
Webster-Stratton (2011)	0,367	0,000
	0,628	0,000

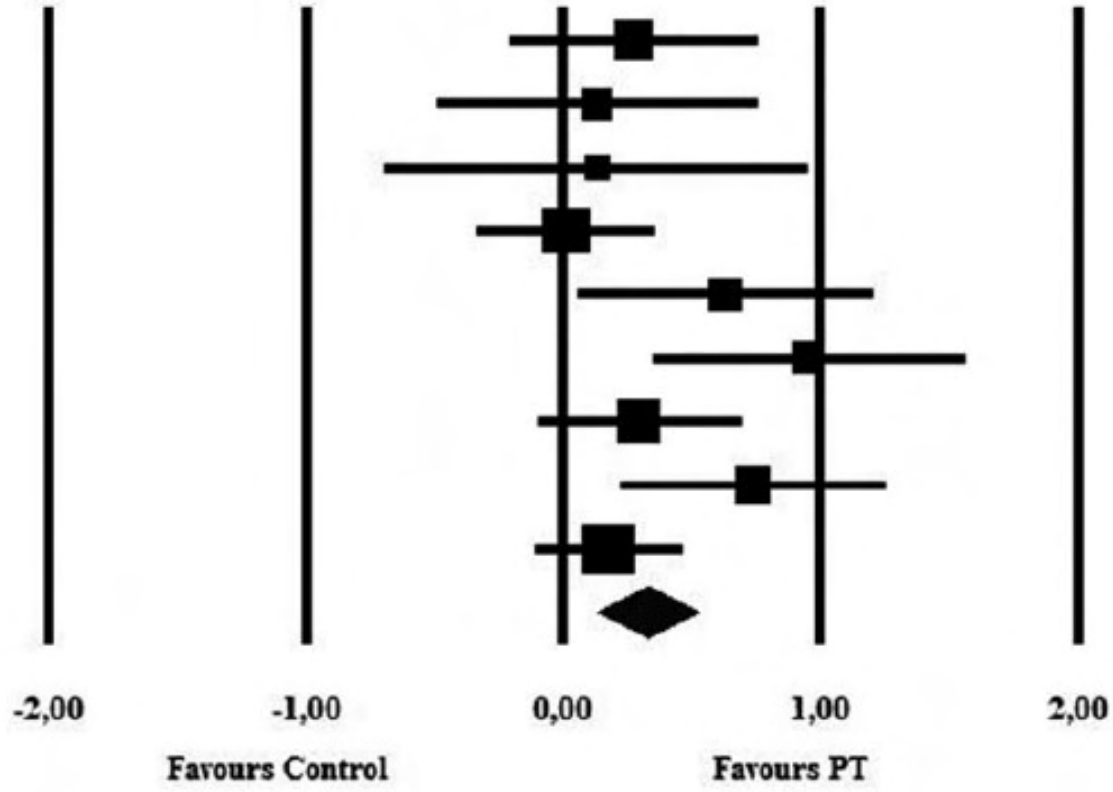


From www.ADHDevidence.org

Independent Assessment of Negative Parenting

(Rimestad et al. *J Atten Disord*. 2019)

First study author	Hedges's g	p-Value
Azevedo (2013)	0,274	0,269
Bor(2002)	0,133	0,674
Herbert (2013)	0,129	0,758
McGilloway (2012)	0,010	0,953
McGoey(2005)	0,630	0,032
Pisterman (1992)	0,954	0,002
Scott (2010)	0,297	0,142
Thompson (2009)	0,736	0,005
Webster-Stratton (2011)	0,178	0,220
	0,328	0,001



From www.ADHDevidence.org

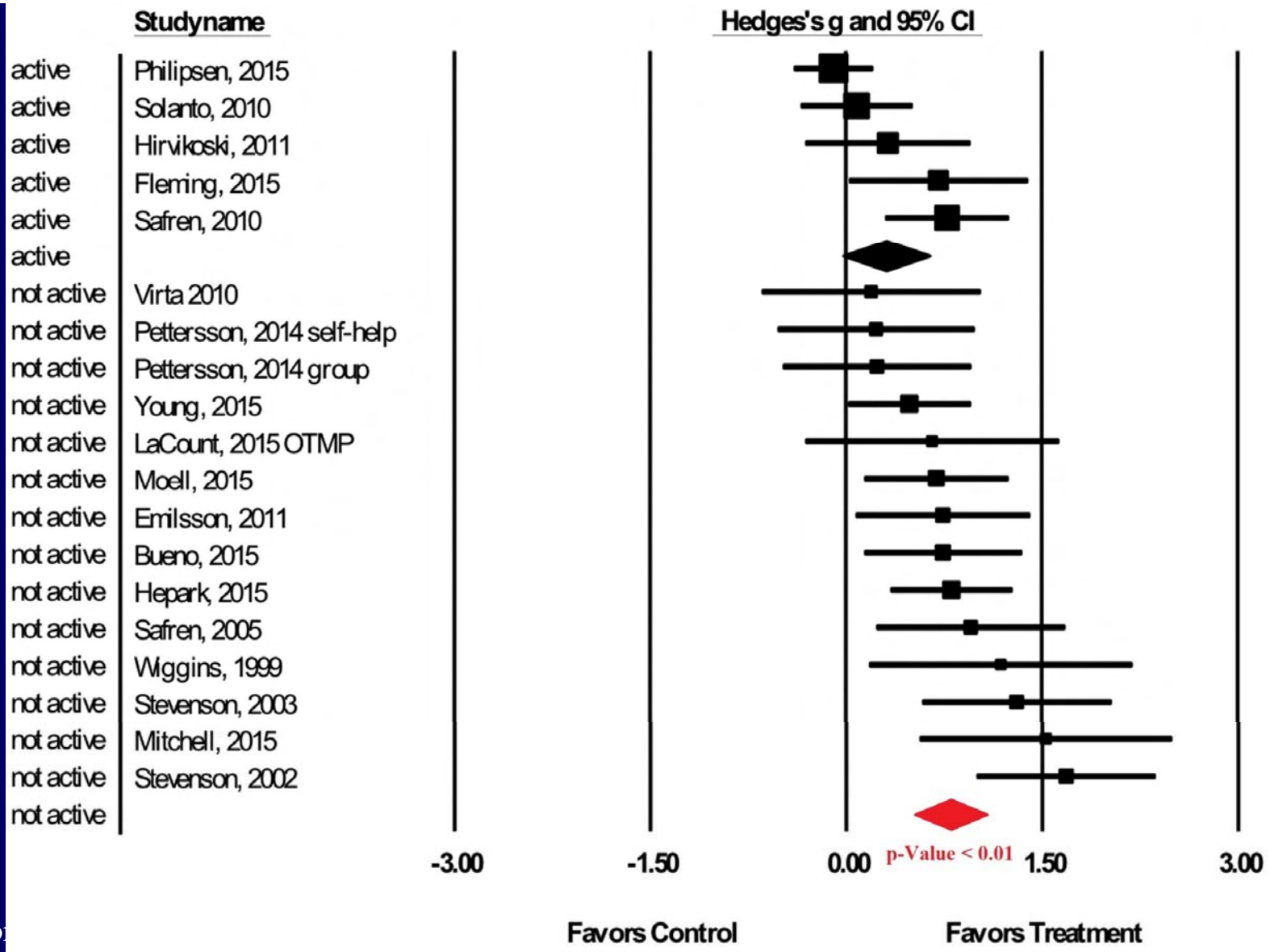
Cognitive-Behavioral Treatment for Adults with ADHD

(Knouse et al. *J Consult Clin Psychol*. 2017)

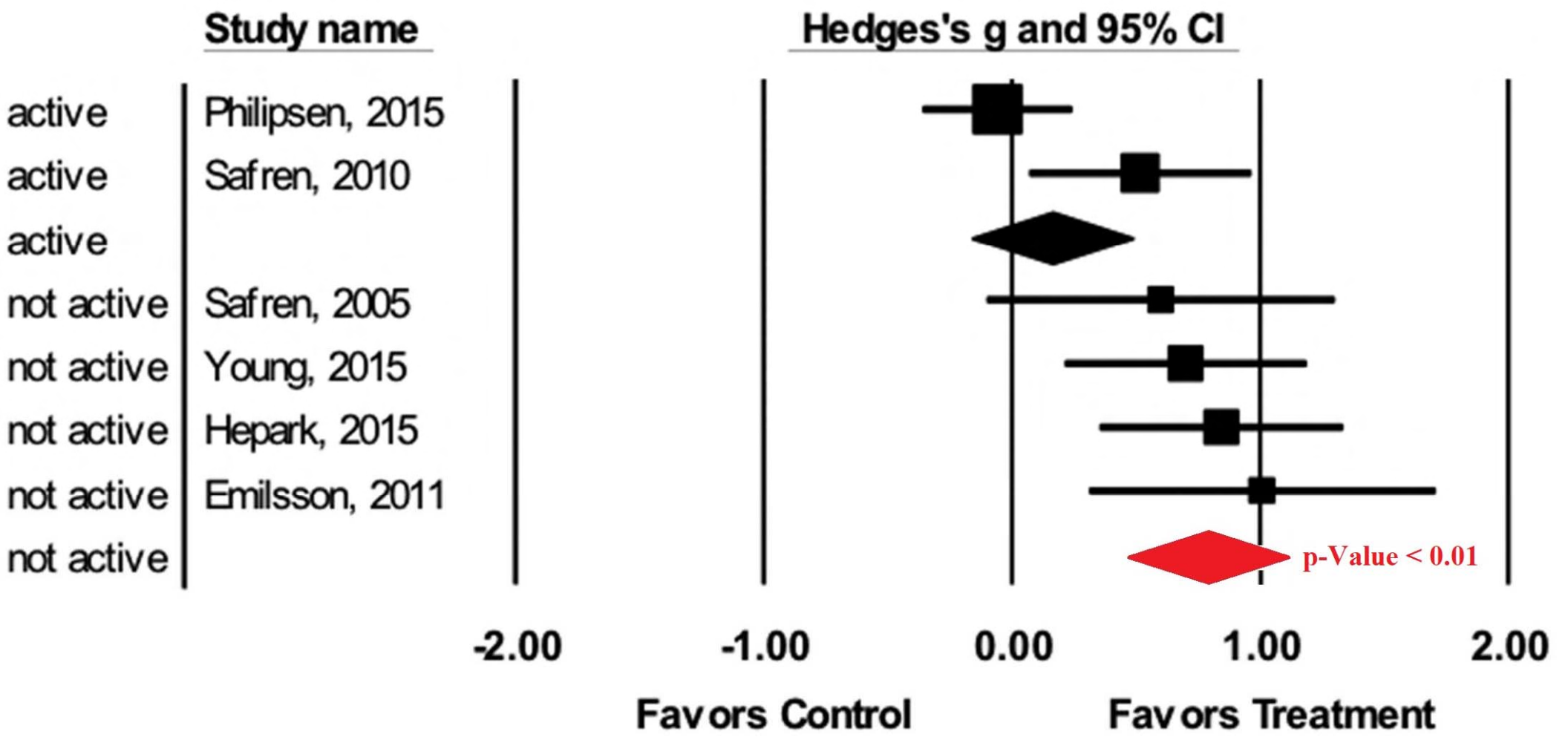
A meta-analysis of 19 studies of cognitive behavior therapy (CBT) for adults with ADHD included 896 participants. It found associations with moderate improvements in self-reported ADHD symptoms and self-reported functioning. But when limited to the two studies with active controls and blind assessors (N = 244 participants), it found only small improvements.

Graphs in next two slides.

CBT: All Studies



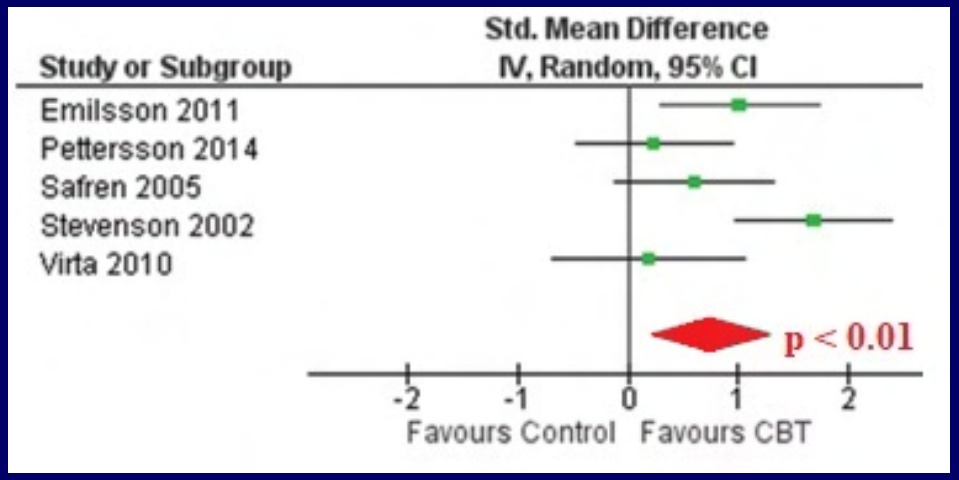
CBT: Blinded Assessors Only



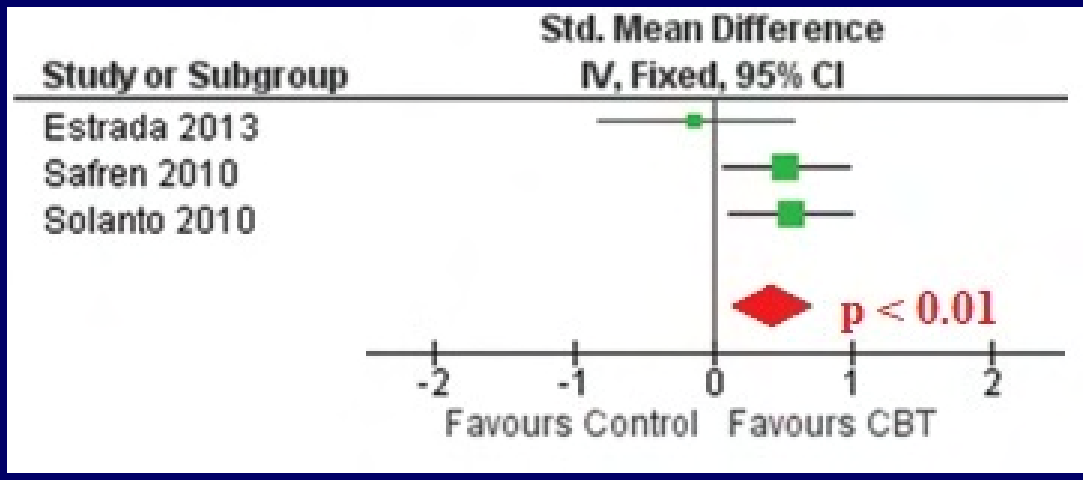
Efficacy of CBT for Adults with ADHD

(Young et al. *J Atten Disord. 2016)*

In another meta-analysis of 160 patients with adult ADHD, CBT led to large to moderate improvements compared with waiting list controls. In three studies of 191 patients CBT led to small to moderate improvements compared to active controls.



CBT versus waitlist, outcome: ADHD symptoms

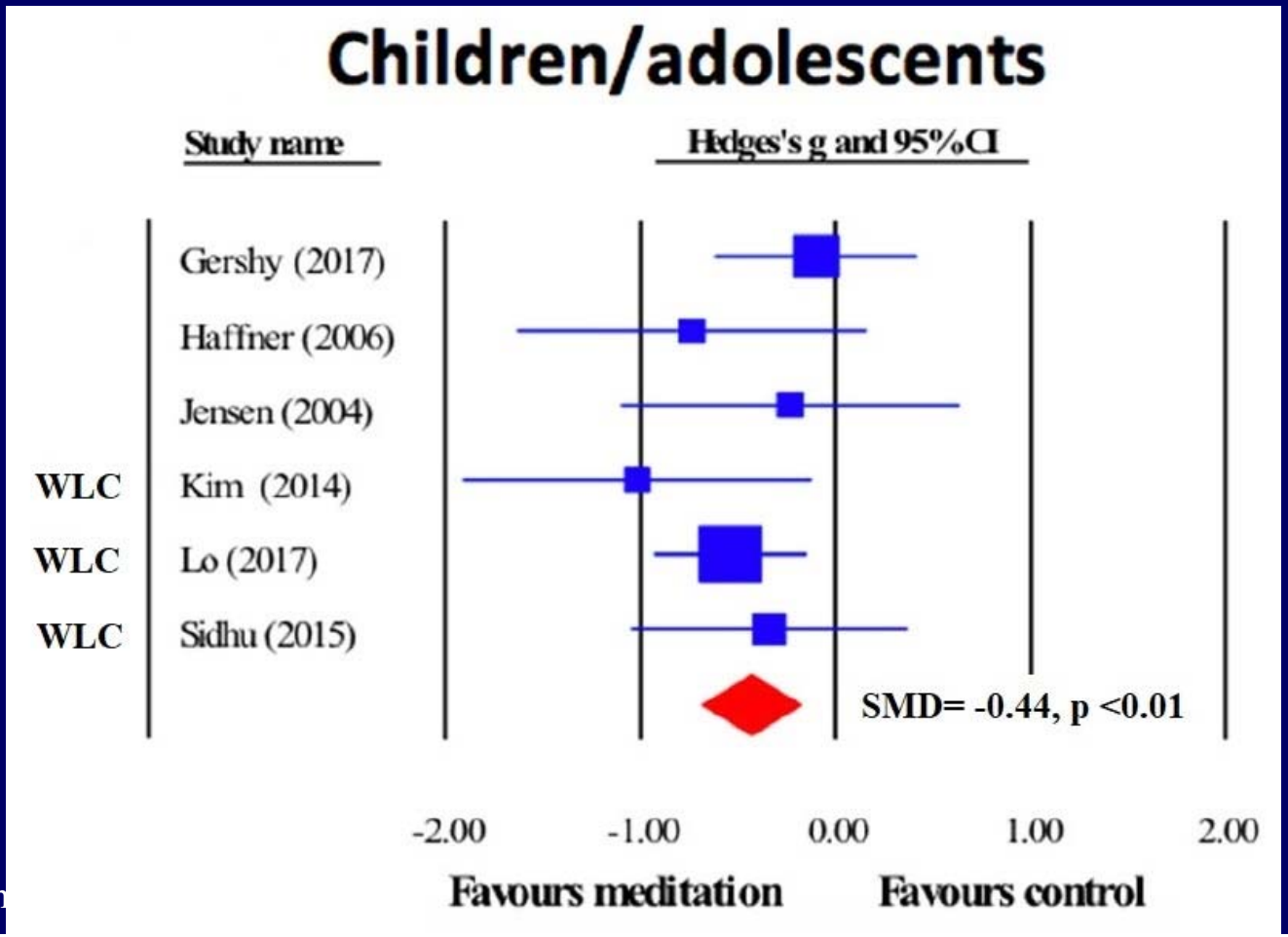


CBT versus active control, outcome: ADHD symptoms

From www.ADHDevidence.org

ADHD & Meditation-based Therapy

(Zhang et al. *Evid Based Ment Health. 2018)*

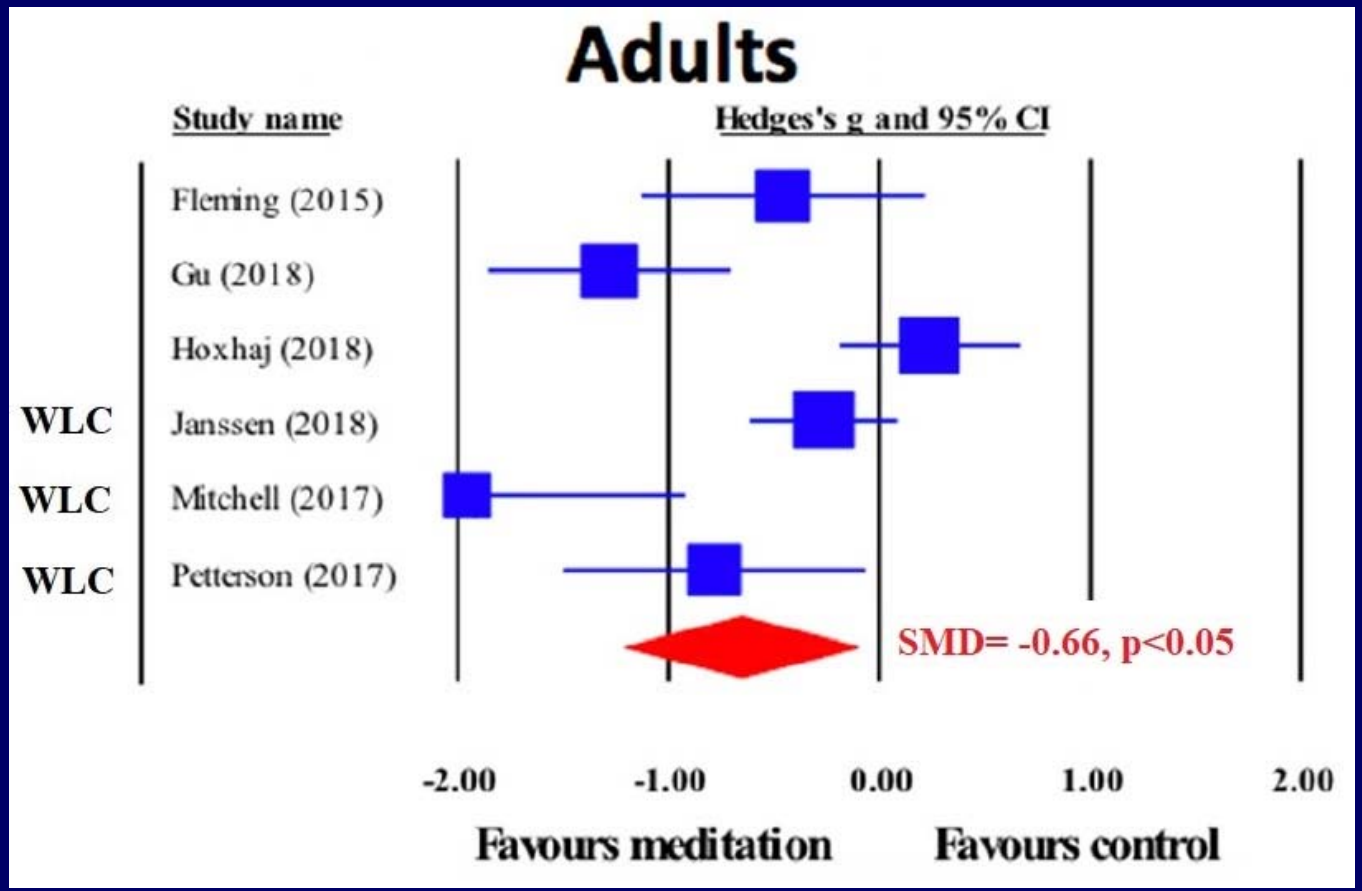


Not significant after removing waiting list controls

From

ADHD & Meditation-based Therapy

(Zhang et al. *Evid Based Ment Health. 2018)*



Not significant after removing waiting list controls

From www.ADHDevidence.org

ADHD & Social Skills Training

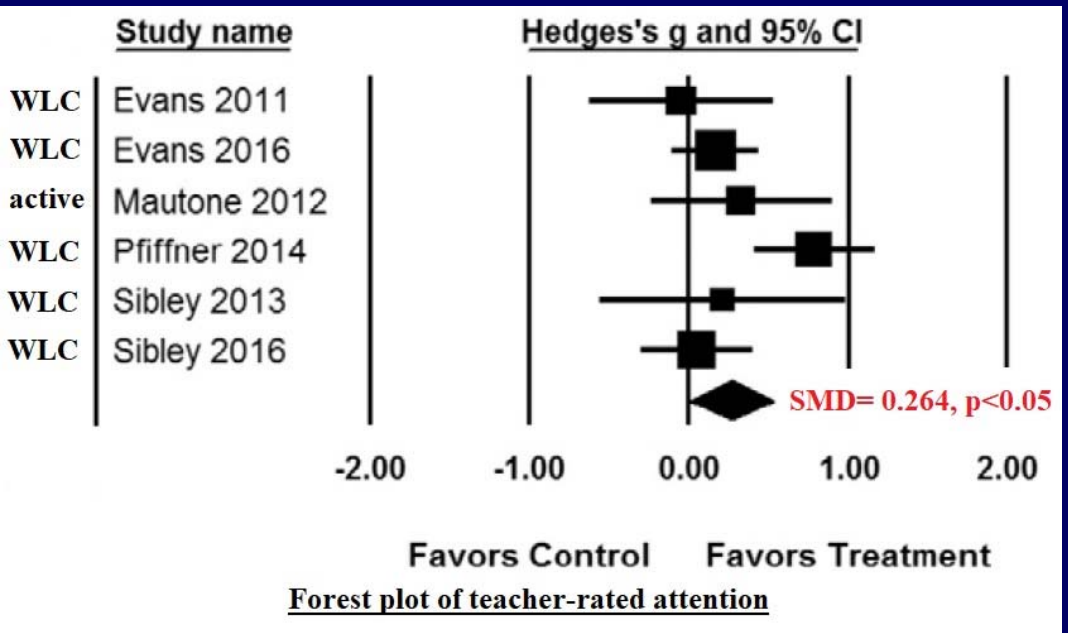
(Storebø et al. *Cochrane Database Syst Rev*. 2019)

A meta-analysis found that social skills training for youth with ADHD did not improve teacher-assessed social skills (11 studies, over 1,200 youths), general behavior (8 studies, over 1,000 youths), or school performance and grades (5 studies, over 600 youths).

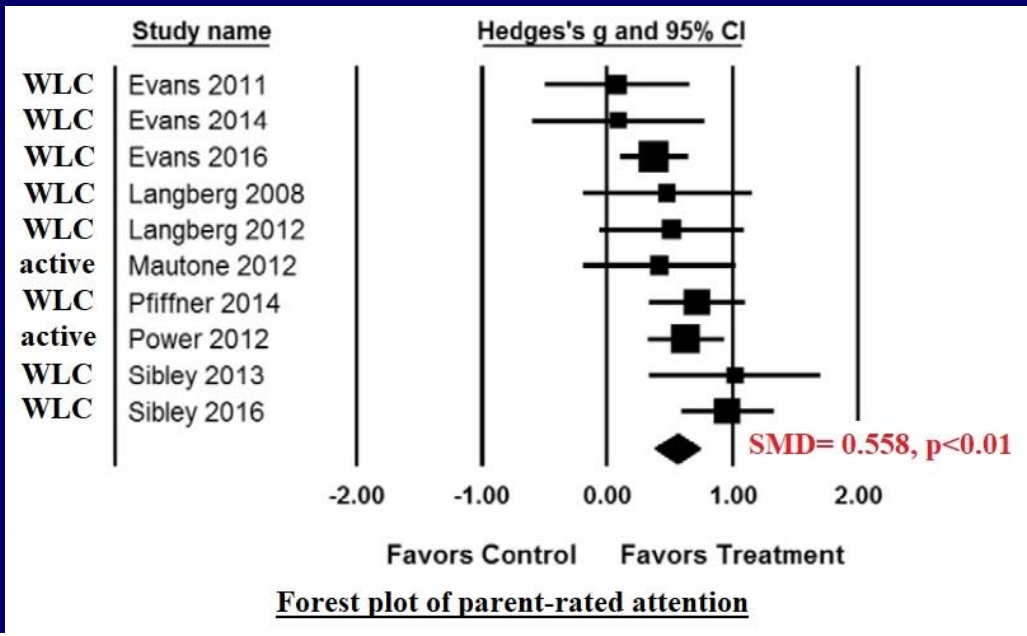
ADHD & Organizational Skills Interventions

(Bikic et al. *Clin Psychol Rev*. 2017)

A meta-analysis of ten studies with 893 youths reported that organizational skills interventions led to moderate reductions in parent-reported inattention symptoms.



Forest plot of teacher-rated attention



Forest plot of parent-rated attention

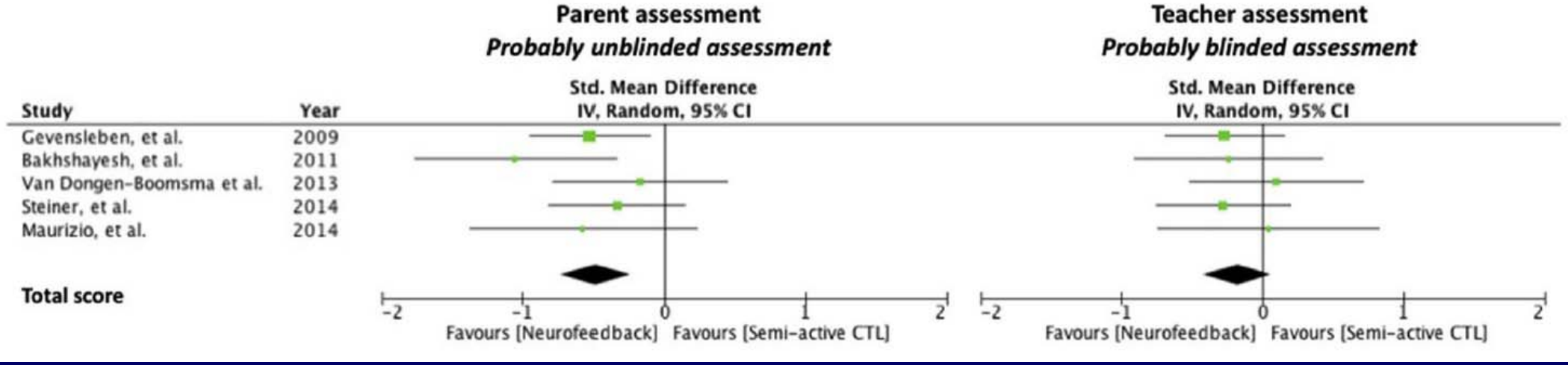
Which Non-Medication Treatments are Safe and Effective for ADHD

- Behavioral and Cognitive-Behavioral Therapies
- Computer-based Cognitive Training and Neurofeedback
- Supplements, Diet, and Exercise

From www.ADHDevidence.org

ADHD & Efficacy of Neurofeedback

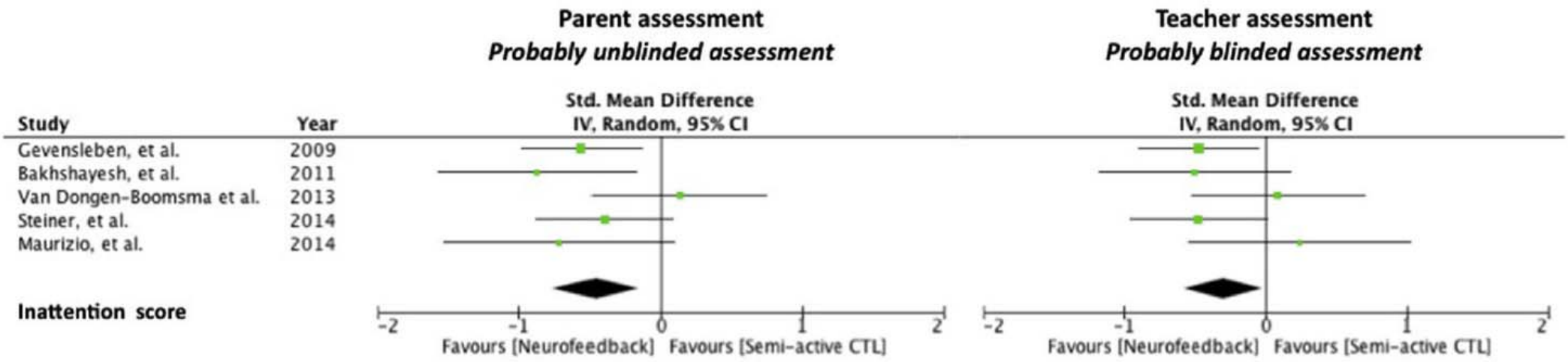
(Micoulaud-Franchi et al. Front Hum Neurosci. 2014)



From www.ADHDevidence.org

ADHD & Efficacy of Neurofeedback

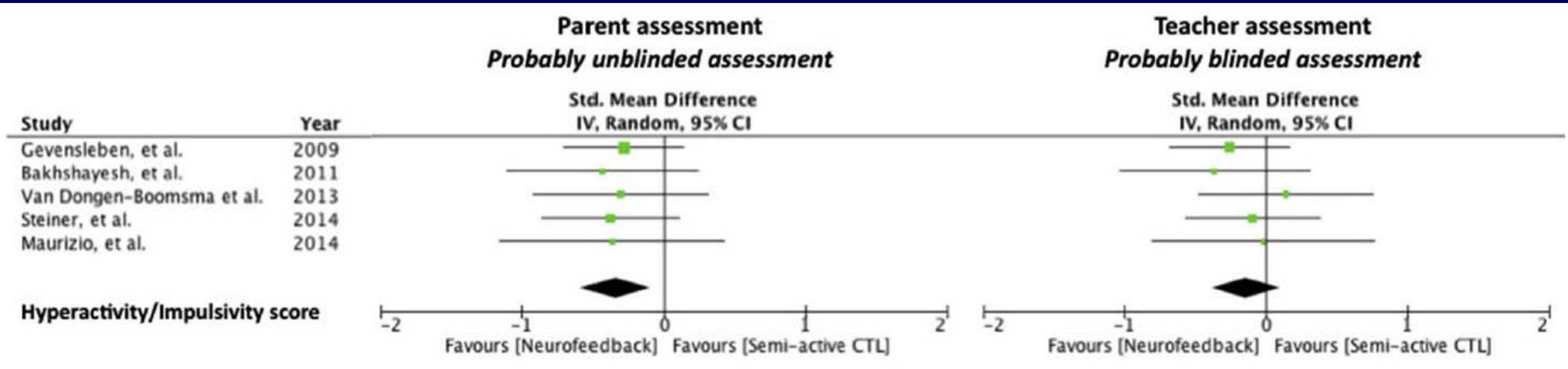
(Micoulaud-Franchi et al. Front Hum Neurosci. 2014)



From www.ADHDevidence.org

ADHD & Efficacy of Neurofeedback

(Micoulaud-Franchi et al. Front Hum Neurosci. 2014)



From www.ADHDevidence.org

ADHD & Efficacy of Neurofeedback

(Van et al. *Eur Child Adolesc Psychiatry*. 2019)

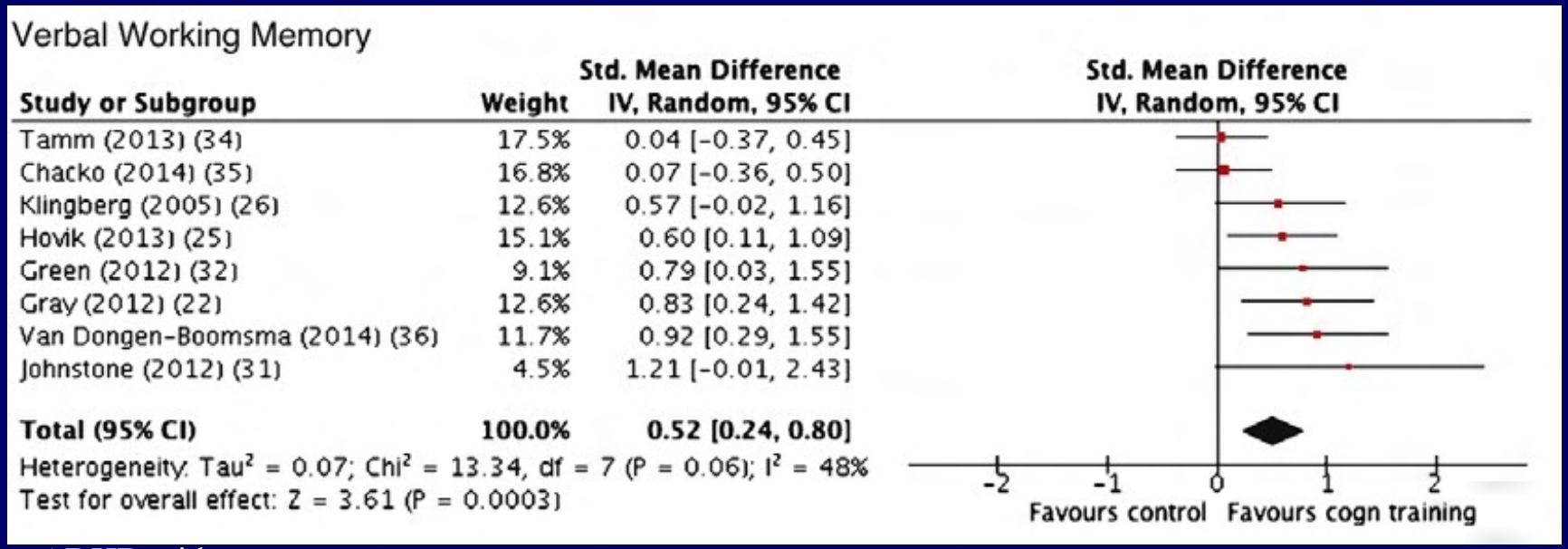
A more recent meta-analysis of ten RCTs with 256 participants found no effect on inattention symptoms, but a small-to-medium reduction in hyperactivity-impulsivity symptoms.

From www.ADHDevidence.org

ADHD & Cognitive Training

(Cortese et al. *J Am Acad Child Adolesc Psychiatry.* 2015)

Probably blinded cognitive training studies with active controls reported no significant reduction in ADHD symptoms. But they did find moderate improvements in verbal working memory. There were no significant effects on math, reading, visual working memory, attention, and inhibition.



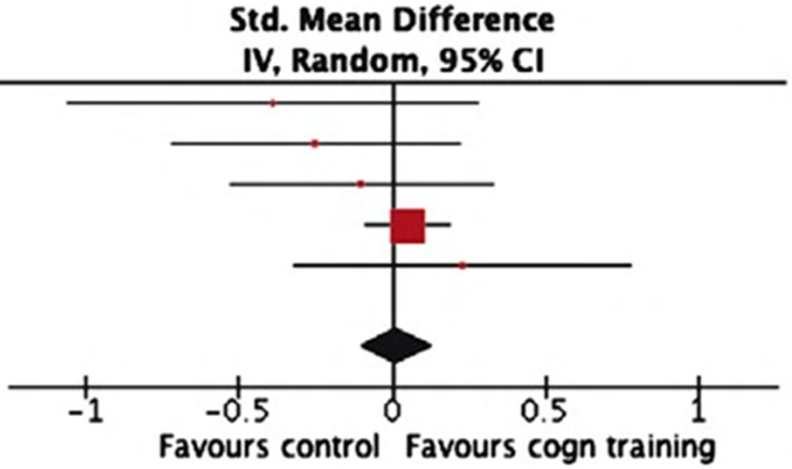
From www.ADHDevidence.org

Academic outcomes

Math

Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
Shalev (2006) (27)	3.3%	-0.39 [-1.06, 0.28]
Egeland (2013) (24)	6.6%	-0.25 [-0.72, 0.22]
Chacko (2014) (35)	7.8%	-0.10 [-0.53, 0.33]
Rabiner (2010) (29)	77.4%	0.05 [-0.09, 0.19]
Gray (2012) (22)	4.8%	0.23 [-0.32, 0.78]
Total (95% CI)	**100.0%**	**0.01 [-0.11, 0.13]**

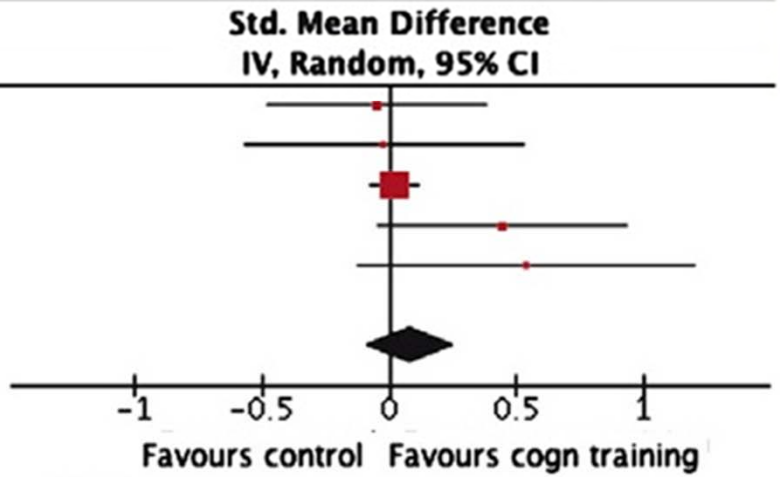
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 3.75$, df = 4 (P = 0.44); $I^2 = 0\%$
Test for overall effect: Z = 0.21 (P = 0.84)



Reading

Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
Chacko (2014) (35)	13.8%	-0.05 [-0.48, 0.38]
Gray (2012) (22)	9.2%	-0.02 [-0.57, 0.53]
Rabiner (2010) (29)	59.2%	0.02 [-0.08, 0.12]
Egeland (2013) (24)	11.2%	0.45 [-0.04, 0.94]
Shalev (2006) (27)	6.5%	0.54 [-0.13, 1.21]
Total (95% CI)	**100.0%**	**0.09 [-0.09, 0.27]**

Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 5.23$, df = 4 (P = 0.26); $I^2 = 23\%$
Test for overall effect: Z = 0.97 (P = 0.33)

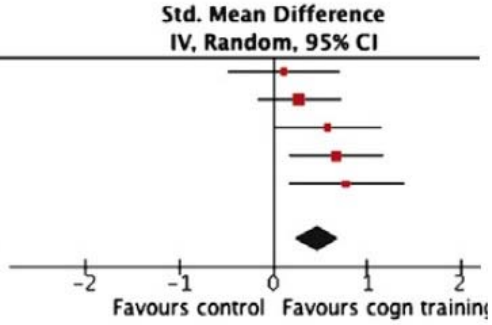


From

Visual Working Memory

Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
Van Dongen-Boomsma (2014) (36)	15.9%	0.12 [-0.47, 0.71]
Chacko (2014) (35)	29.5%	0.28 [-0.15, 0.71]
Gray (2012) (22)	17.0%	0.58 [0.01, 1.15]
Hovik (2013) (25)	22.8%	0.67 [0.18, 1.16]
Klingberg (2005) (26)	14.9%	0.78 [0.17, 1.39]
Total (95% CI)	**100.0%**	**0.47 [0.23, 0.70]**

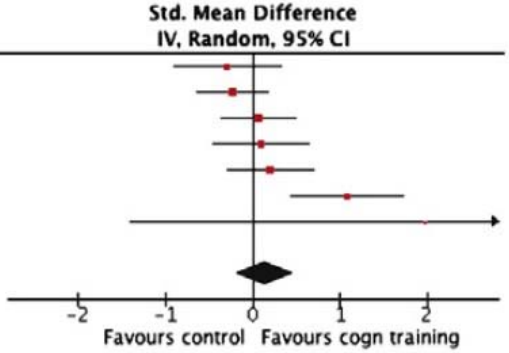
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 3.89$, df = 4 (P = 0.42); $I^2 = 0\%$
Test for overall effect: Z = 3.92 (P < 0.0001)



Attention

Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
Van Dongen-Boomsma (2014) (36)	14.4%	-0.29 [-0.90, 0.32]
Tamm (2013) (34)	19.3%	-0.23 [-0.64, 0.18]
Chacko (2014) (35)	18.8%	0.07 [-0.36, 0.50]
Gray (2012) (22)	15.8%	0.10 [-0.45, 0.65]
Egeland (2013) (24)	17.2%	0.20 [-0.29, 0.69]
Johnstone (2012) (31)	13.6%	1.08 [0.43, 1.73]
Tucha (2011) (30)	1.0%	1.98 [-1.41, 5.37]
Total (95% CI)	**100.0%**	**0.14 [-0.19, 0.48]**

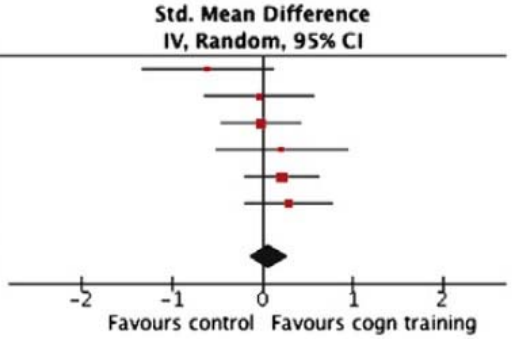
Heterogeneity: $Tau^2 = 0.11$; $Chi^2 = 14.22$, df = 6 (P = 0.03); $I^2 = 58\%$
Test for overall effect: Z = 0.83 (P = 0.41)



Inhibition

Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
Van Dongen-Boomsma (2014) (36)	8.8%	-0.61 [-1.34, 0.12]
Johnstone (2012) (31)	12.4%	-0.04 [-0.65, 0.57]
Chacko (2014) (35)	24.4%	-0.02 [-0.45, 0.41]
Johnstone (2010) (28)	8.8%	0.21 [-0.52, 0.94]
Tamm (2013) (34)	26.7%	0.22 [-0.19, 0.63]
Egeland (2013) (24)	19.0%	0.29 [-0.20, 0.78]
Total (95% CI)	**100.0%**	**0.07 [-0.15, 0.28]**

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 5.10$, df = 5 (P = 0.40); $I^2 = 2\%$
Test for overall effect: Z = 0.62 (P = 0.53)



Cognitive Training for Treating ADHD preschoolers

(Pauli-Pott et al. *Eur Child Adolesc Psychiatry*. 2020)

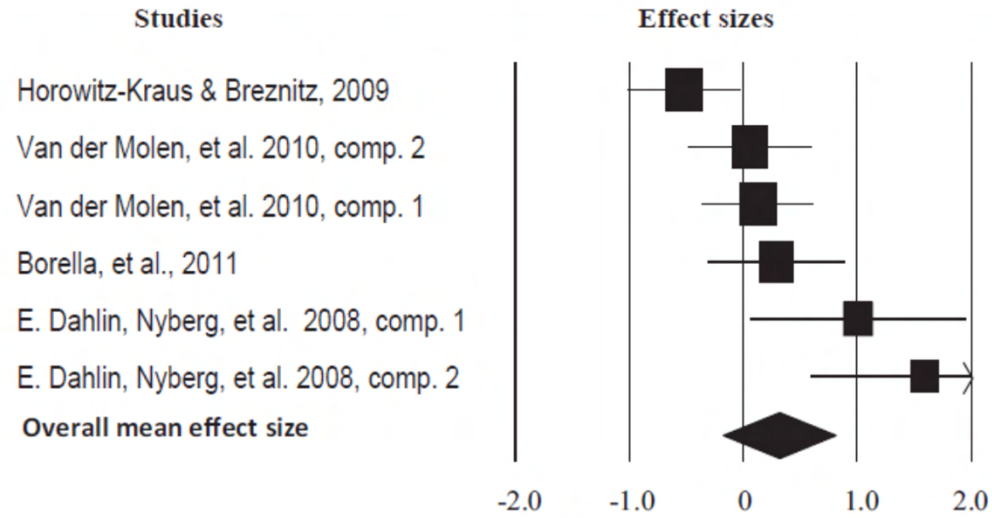
- A meta-analysis of randomized controlled trials (RCTs) with preschoolers found:
  - Significant improvements in working memory (0.46) and inhibitory control (0.30)
  - No significant improvements in flexibility, reward dysregulation, or symptoms of ADHD and oppositional defiant disorder.

ADHD & Effectiveness of Memory Training

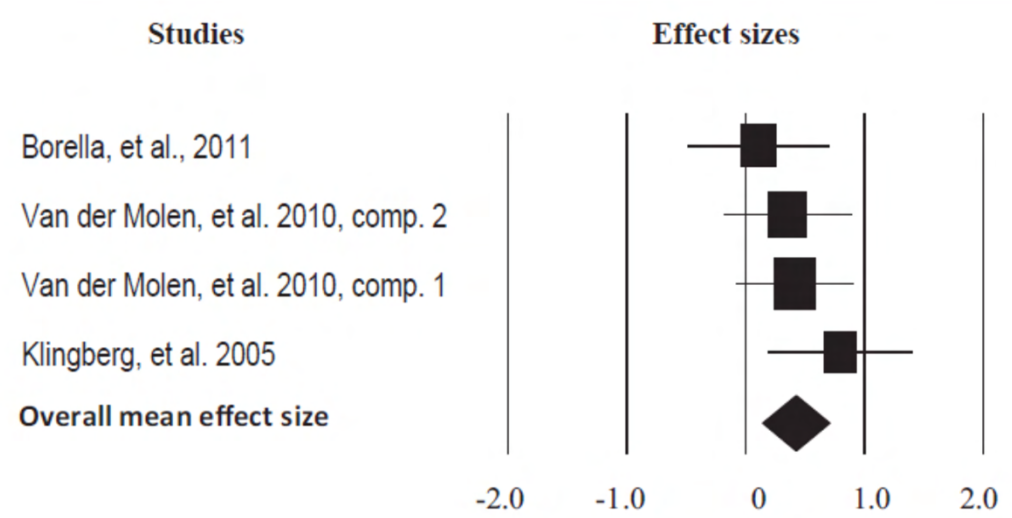
(Melby-Lervag & Hulme. Dev Psychol. 2013)

A meta-analysis found that working memory training led to short-term improvements in both verbal working memory (21 studies, over 1,300 participants) and visuospatial working memory (18 studies, over 1,000 participants), with "no convincing evidence that even such near-transfer effects are durable." Most studies lacked active controls.

Verbal Working Memory



Visuospatial Working Memory



Which Non-Medication Treatments are Safe and Effective for ADHD

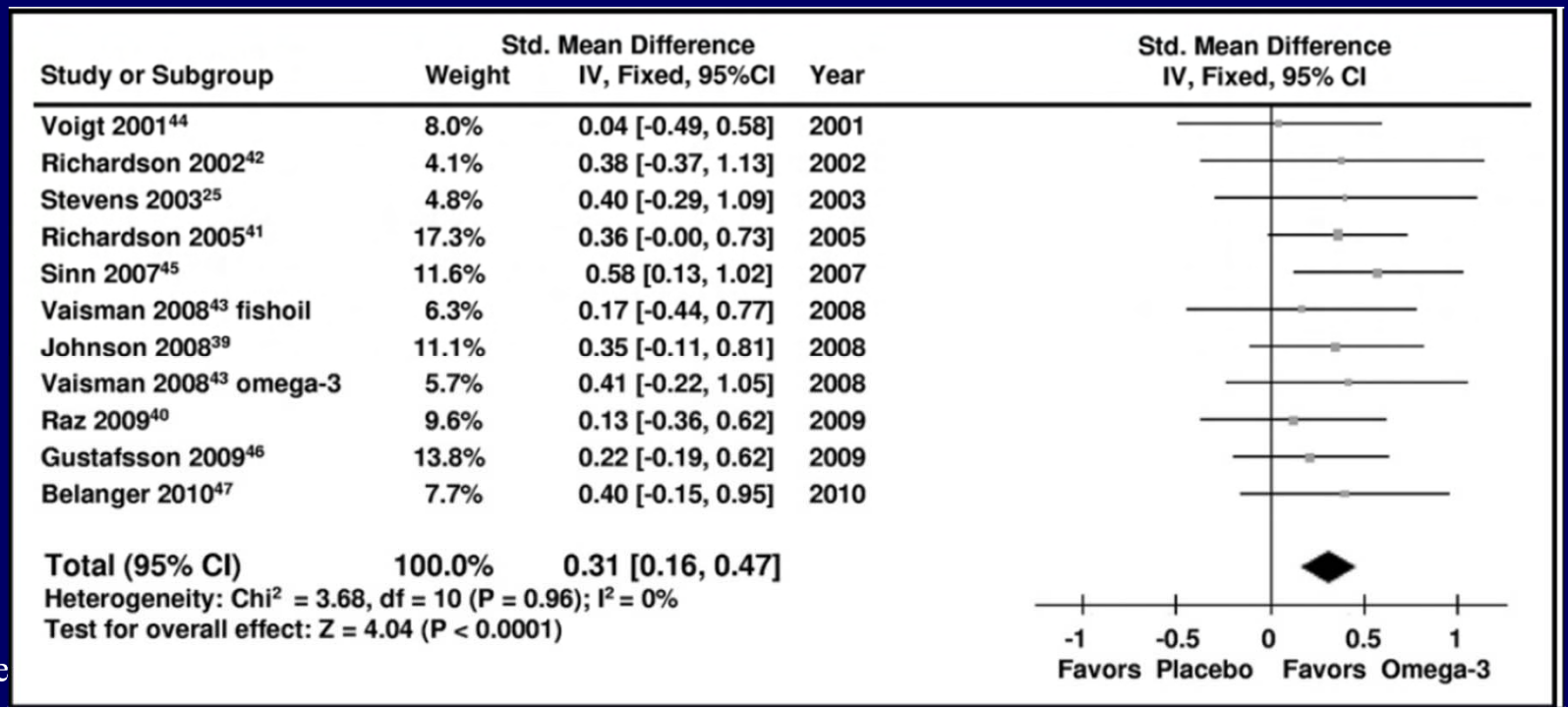
- Behavioral and Cognitive-Behavioral Therapies
- Computer-based Cognitive Training and Neurofeedback
- Supplements, Diet, and Exercise

From www.ADHDevidence.org

ADHD & Omega-3 Fatty Acid Supplementation

(Bloch & Qawasmi. *J Am Acad Child Adolesc Psychiatry. 2011 & 3 more sources)*

Omega-3 fatty acid supplementation was associated with small-to-medium improvements in ADHD symptoms in three meta-analyses (ten studies with 699 participants, 16 studies with 1,408 participants, 7 studies with 534 participants). Another meta-analysis, with 18 studies and 1,640 participants, found tiny improvements.



Study or Subgroup	Weight	Std. Mean Difference IV, Fixed, 95%CI	Year
Voigt 2001[44]	8.0%	0.04 [-0.49, 0.58]	2001
Richardson 2002[42]	4.1%	0.38 [-0.37, 1.13]	2002
Stevens 2003[25]	4.8%	0.40 [-0.29, 1.09]	2003
Richardson 2005[41]	17.3%	0.36 [-0.00, 0.73]	2005
Sinn 2007[45]	11.6%	0.58 [0.13, 1.02]	2007
Vaisman 2008[43] fishoil	6.3%	0.17 [-0.44, 0.77]	2008
Johnson 2008[39]	11.1%	0.35 [-0.11, 0.81]	2008
Vaisman 2008[43] omega-3	5.7%	0.41 [-0.22, 1.05]	2008
Raz 2009[40]	9.6%	0.13 [-0.36, 0.62]	2009
Gustafsson 2009[46]	13.8%	0.22 [-0.19, 0.62]	2009
Belanger 2010[47]	7.7%	0.40 [-0.15, 0.95]	2010
Total (95% CI)	100.0%	0.31 [0.16, 0.47]	

Heterogeneity: $Chi^2 = 3.68$, $df = 10$ ($P = 0.96$); $I^2 = 0\%$

Test for overall effect: $Z = 4.04$ ($P < 0.0001$)

From www.ADHDevidence

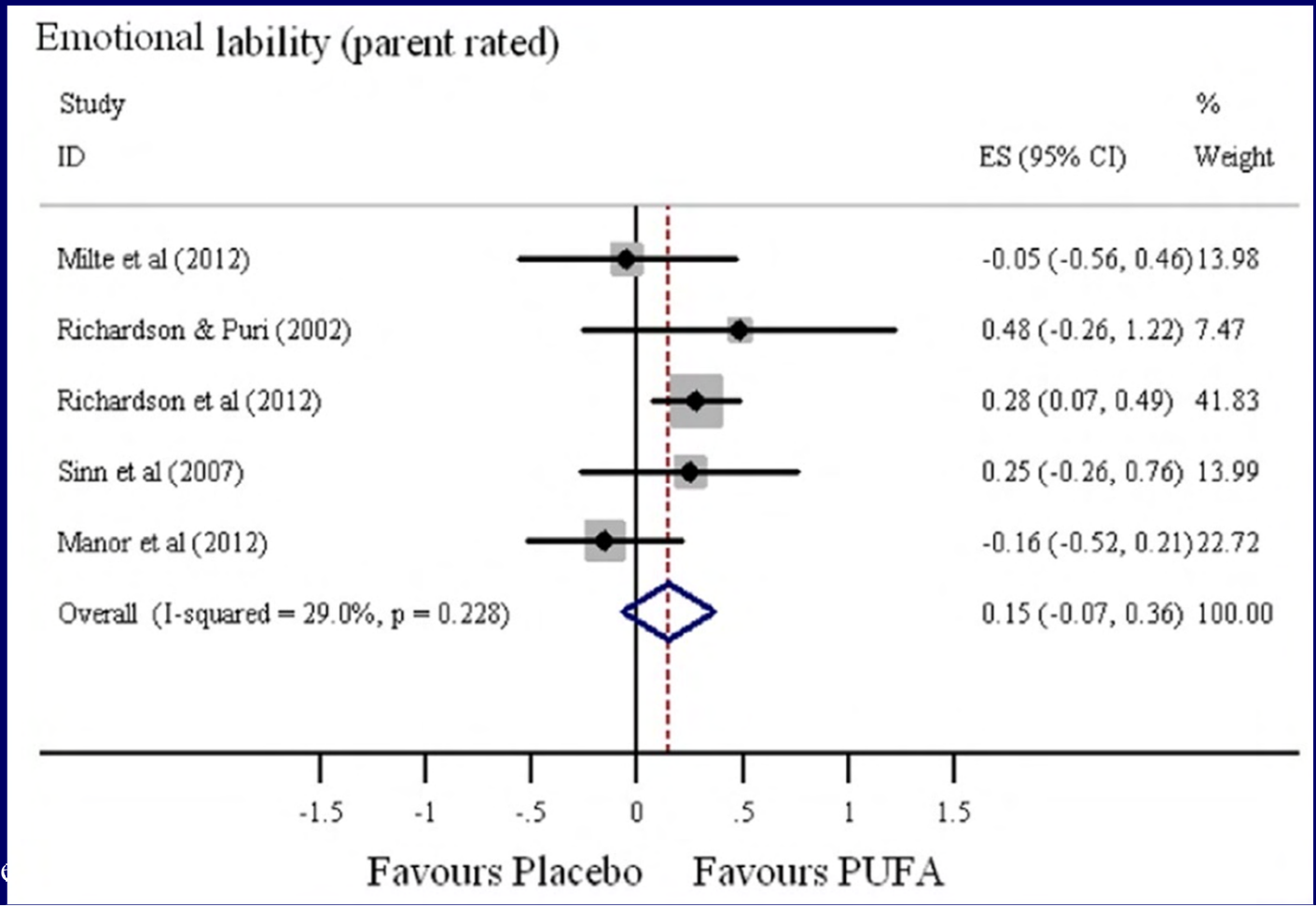
ADHD & Omega-3 Fatty Acid Supplementation

(Cooper et al. *J Affect Disord*. 2016)

A meta-analysis found no evidence of any effect of omega-3 fatty acid supplements on parent-rated (5 studies, 650 children) or teacher-rated (3 studies, 598 children) emotional lability symptoms, or parent-rated (8 studies, 875 children) or teacher-rated (6 studies, 805 children) oppositional symptoms in children with ADHD.

ADHD & Omega-3 Fatty Acid Supplementation

(Cooper et al. *J Affect Disord*. 2016)



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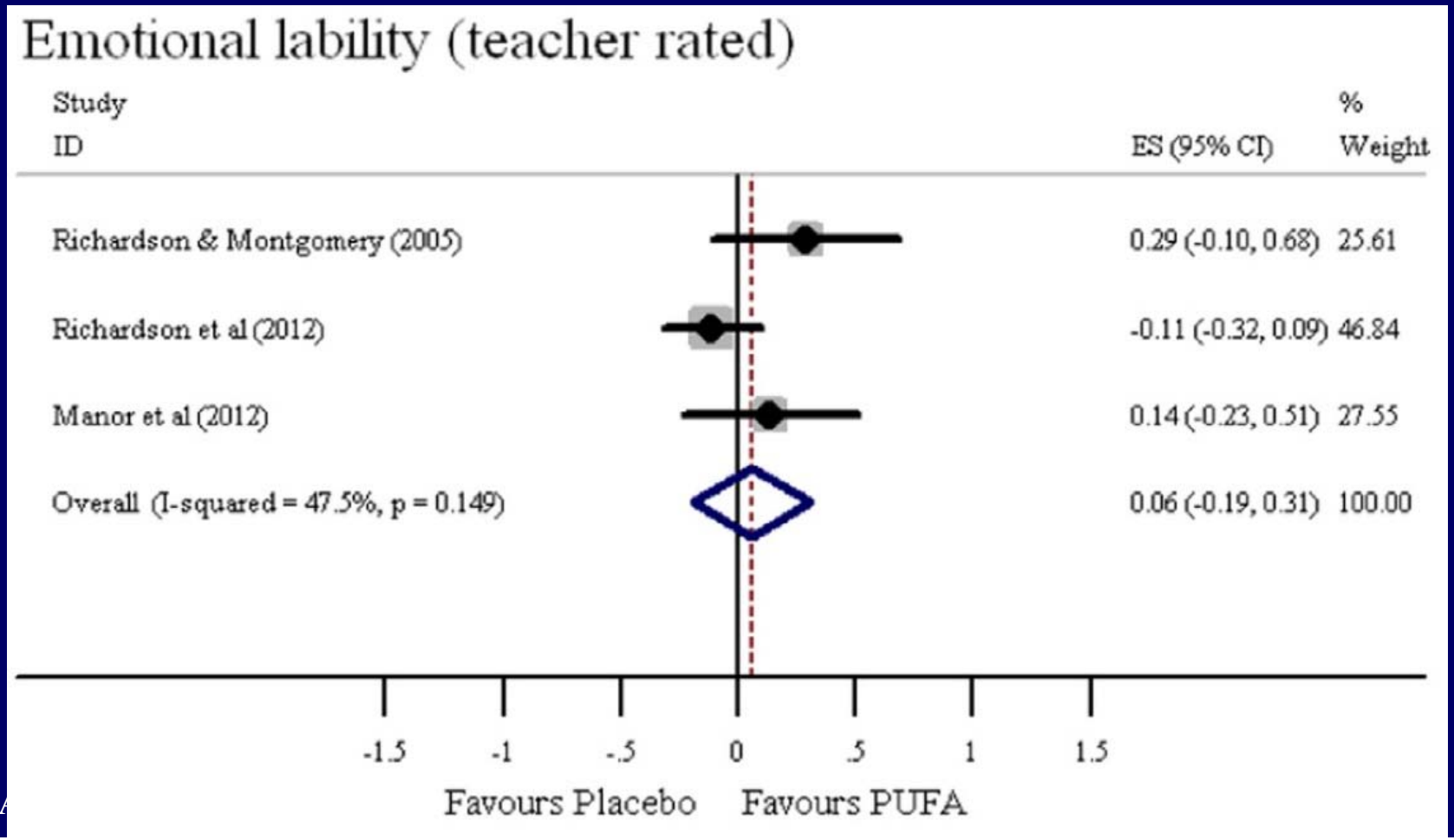
ADHD & Omega-3 Fatty Acid Supplementation

(Cooper et al. *J Affect Disord*. 2016)



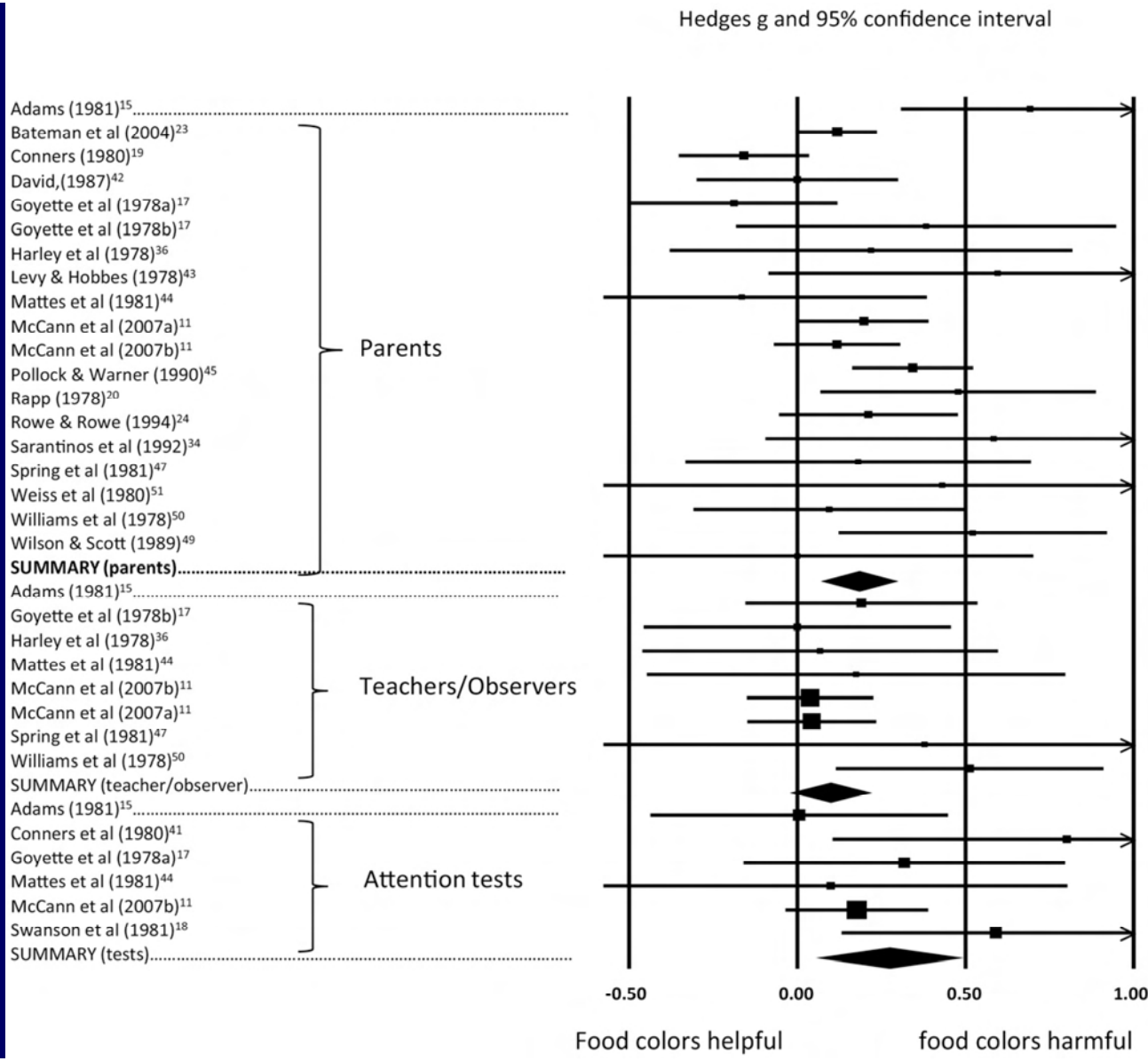
From www.A

ADHD & Synthetic Food Colors

(Nigg et al. *J Am Acad Child Adolesc Psychiatry.* 2012)

A meta-analysis of five double-blind crossover studies with 164 participants found that restricting synthetic food colors from children's diets was associated with a small reduction in ADHD symptoms.

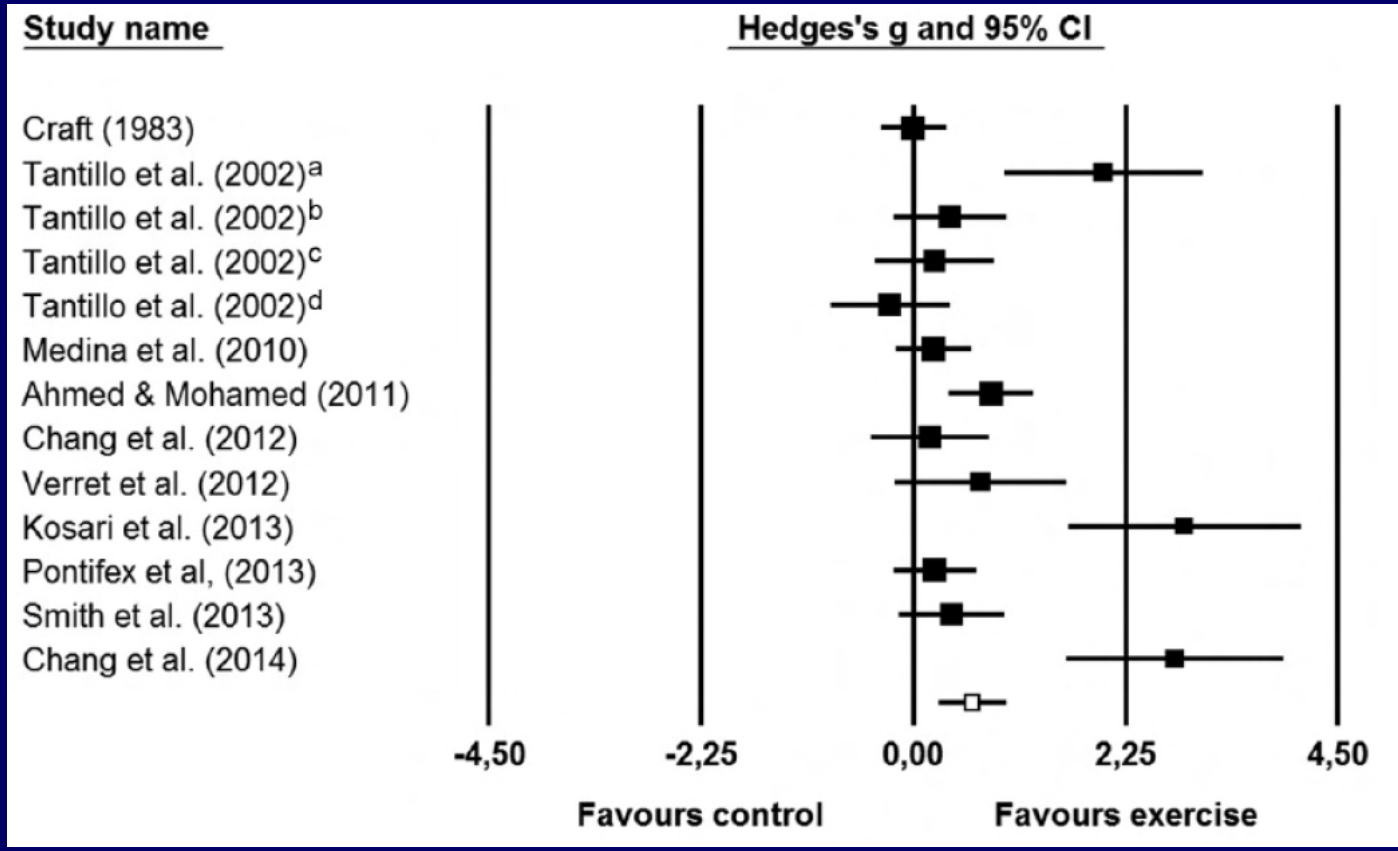
From www.ADHDevidence.org



ADHD & Physical Exercise

(Vysniauske et al. *J Atten Disord. 2016)*

A meta-analysis of ten studies (300 children) found exercise was associated with a moderate reduction in ADHD symptoms but had no significant effect after adjusting for publication bias.



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Impact of Physical Exercise on Children with ADHD

(Zang, Y. *Medicine*. 2019)

Another meta-analysis found no significant effect of exercise on either hyperactivity/impulsivity (4 studies, 227 participants) or inattention symptoms (6 studies, 277 participants), but significant reductions in anxiety and depression (5 studies, 164 participants).

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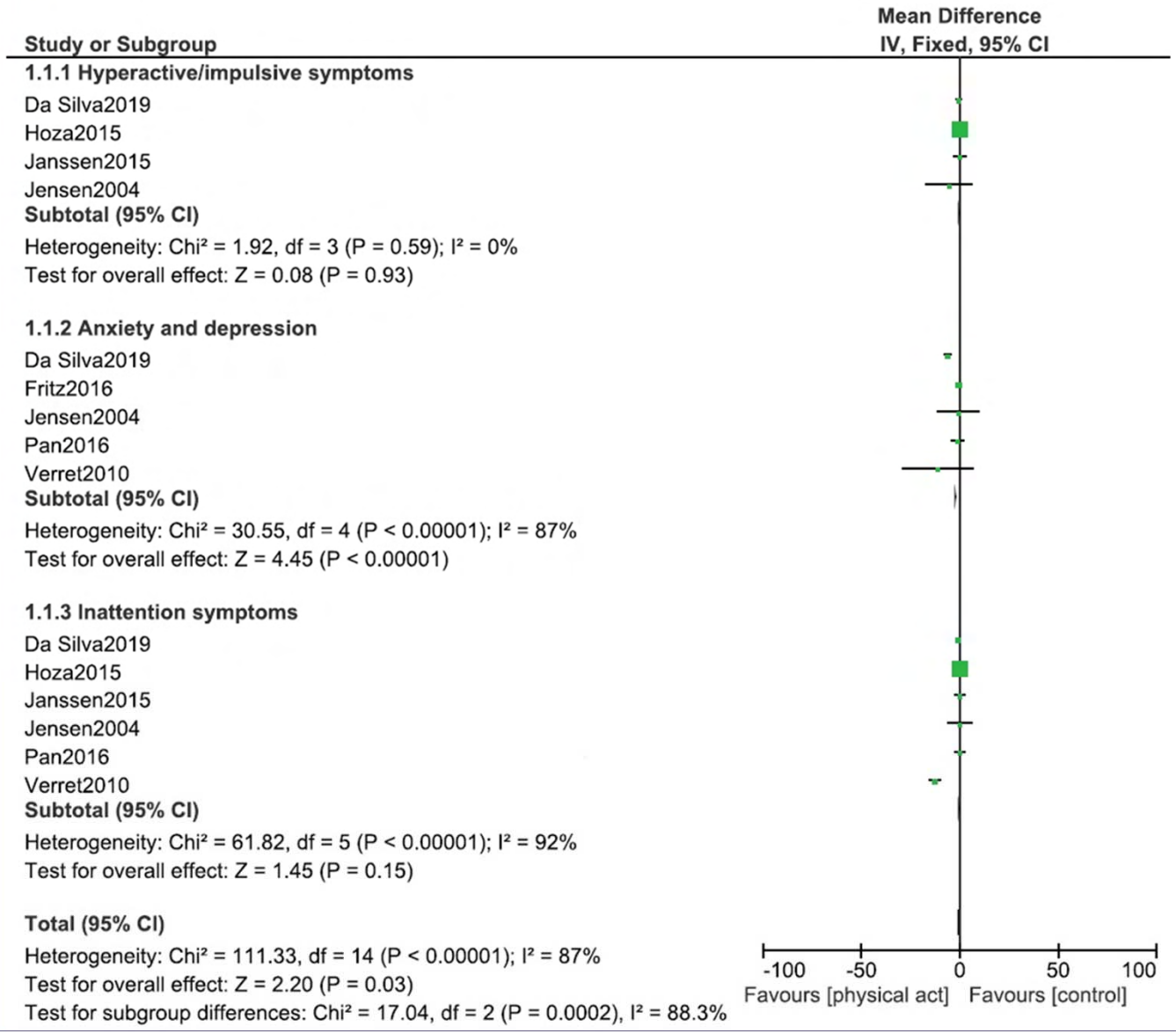

ADHD & Dietary Habits in Adulthood

(Li et al. *Am J Med Genet B Neuropsychiatr Genet*. 2020)

A nationwide population study using the Swedish Twin Register identified almost 18,000 twins who completed a web-based examining the relationship between inattention and hyperactivity/impulsivity subtypes and dietary habits. ADHD was associated with unhealthy diets high in added sugar, meat and fats and low in fruits and vegatables.

Modifiable Risk Factors for ADHD

- EXPOSURES TO CHILDREN
- Lead exposure
- Artificial food colorants
- Poverty
- Organophosphate pesticide exposure
- Family adversity – Low cohesion
- Extreme deprivation
- NUTRIENT DEFICIENCIES
- Iron deficiency
- Omega-3 polyunsaturated Fatty Acid Deficiency
- Vitamin D deficiency

- EXPOSURES TO THE FETUS
- acetaminophen
- Valproate
- Phthalate
- Maternal pre-eclampsia & hypertension
- Maternal stress
- Preterm birth

From www.ADHDevidence.org

Plans for Disseminating the ICS ADHD

To maximize the impact of the ICS ADHD it needs to be disseminated to patients, families, ADHD advocates, clinicians, policymakers and any other stakeholder groups. You can help by using social media to spread the word

From www.ADHDevidence.org

Current Translations of the ICS ADHD

Experts of the WF ADHD have written an International Consensus Statement, that is now available in Arabic, Catalan, Chinese, English, French, German, Italian, Russian, Spanish and Turkish language.

If, after reading the International Consensus Statement, you approve its contents, please join as a signatory by emailing Prof. Faraone: svfaraone@upstate.edu

Arabic version | Catalan version | Chinese version | English version

French version | German version | Italian version | Spanish version

Turkish version | Turkish supplement

Brand new translation: Russian version

Welsh Translation of the ICS Abstract

Welsh ICS Abstract

From www.ADHDevidence.org

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You Can Help

- Translate the ICS ADHD into another language
- Promote the ICS ADHD on your social media accounts
- Cite the ICS ADHD in your publications
- Give presentations using slides from the ICS ADHD
  - –Will be freely available at www.ADHDevidence.org.

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