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The following two tables supplement our review, "The challenge of predicting which children with ADHD respond positively to methylphenidate", in press, *Journal of Applied Developmental Psychology*.

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Table 1. Reviews of Predicting MPH Response

Barkley, 1976	# studies	Predictive value
psychophysiological (mainly attentional)	18	EEG equivocal, other measures show some promise
neurological "soft" signs	12	mixed evidence, some correlation?
familial	4	mixed evidence, unclear causality
demographic/sociological	8	none
diagnostic category	5	mixed evidence, anxious worse?
rating scales: teacher	8	inconsistent
parent	7	equivocal
clinician	7	inconsistent
psychological	15	attentional measures are best
Conners' profile types	2	attentional measures predict response within clusters
Taylor, 1983		
overactivity ratings	10	not always predictive
attentiveness	15	mixed evidence

Table 2. Studies Predicting MPH Response (1976-1998)

Study	Participants	Predictor Variables	Response Measures	Relationship
Aman & Turbott, 1991	n = 26 (22 boys) age 5.5-12.7 ADD-H	age, memory distraction task, behavioral inhibition task	parent and teacher ratings (global change, inattention change, motor excess change)	multiple R's = .67 to .71
Aman et al., 1991	n = 30 (IQ's below 90) age 4.1-16 ADHD	high or low functioning (based on breadth of attention, mental age, IQ level)	teacher ratings of problem behavior	higher functioning (esp. IQ > 46) and cognitive maturity predicted improvement
Aman et al., 1993	n = 28, low IQ age 5-13 ADHD	mental age, IQ	parent & teacher ratings	mental age not predictive, IQ > 45 predicts better response

Aman et al., 1997	n = 30 (IQ 36-84) age 5-14 ADHD	age, mental age, IQ, breadth of attention		mental age not predictive, IQ > 50 suggests better response
Barkley & Cunningham, 1979	n = 20 boys age 5-12 hyperkinetic	maternal - child interaction coding	actometers, interaction coding, parental questionnaire	better mother-child relation weakly predicts a better resp.
Barkley & Jackson, 1977	n = 12 boys (known to be MPH resp.), 12 controls age 5-12 hyperkinetic	5 psychophys. measures of autonomic arousal	drug - placebo change scores on 11 behavioral measures	degree of resp. unrelated to initial levels of autonomic arousal
Barkley et al., 1989	n = 70, 37 with comorbid aggression age 6-13 ADHD	aggression group	parent & teacher ratings, MFFT, SRT, CPT, restricted academic situation test	aggression group did not predict MPH response, except as assessed by conduct
Beery, 1994	n = 66 boys age 7-13 ADHD	disinhibition (= mother and teacher reports of impulsivity & hyperactivity)	10 behavioral measures	disinhibition predicted improvement on interrupting others, verbal abuse to staff
Buitelaar et al., 1995	n = 46 (41 boys) age = 6-13 DSM-III-R	neuropsych-ological tests (?), parent & teacher ratings, demographics	improvement at home or school (from Conners' ratings, clinical rating)	not predictive
		above, plus acute resp. to the first 10mg dose	(same as above)	response to first dose helps predicts later response, D's = 60-82%
		WISC-R, inattentive at school, age, severity, home anxiety	strong response (= improved at home <u>and</u> school, n = 8) or not	D = 100% of strong resp., 78% of others.

Carlson et al., 1995	n = 16 boys in psychiatric hospital age 7.7-12.8 ADHD + mood disorder + ODD, CD, or both	multiple psychiatric diagnoses (only this group of 16 was assessed, no controls)	school and hospital staff ratings	changes on externalizing but not internalizing symptoms little to no clinical efficacy
Castellanos et al., 1996	n = 45 boys age 6-12 DSM-III-R	monoamine metabolites (HVA, MHPG, 5-HIAA) in CSF fluid	Conners Teacher Rating Scale	baseline severity + HVA accounted for 73% of variance (higher HVA - better response)
Conte & Kinsbourne, 1988	n = 32 boys age 8.2-12 ADD+H	Electrodermal lability (high, medium, low)	paired associate learning (fast or slow rate)	lability group interacted with task rate; MPH improvement depended on group and rate
de Sonneville et al., 1994	n = 58 boys (30 resp., 28 non-resp.); 27 controls age = 8-11 ADD-H	memory search rate, memory efficiency, impulsivity, RT following incorrect	ratings by parents & others	D = 92% (resp. & non-resp.)
		WISC-R & subtests	(as above)	D = 54%
		neurological exam	(as above)	D = 75%
		psychological tests	(as above)	D = 75%
Denney, 1997	n = 76 (66 boys); same group as in Rapport et al., 1994 age 6-11 ADHD	hyperactivity, attention, initial scores, daily school performance (APRS)	gain scores dose response curves responder status based on confidence intervals optimal dose	multivariate analyses did not support many previous models academic performance is most useful
Douglas et al., 1988	n = 19 (17 boys) age 7.0-13 ADD-H	ratings (9 d.v.), academic tasks (14 d.v.), and cognitive tasks (22 d.v.)	(same as predictors)	all children improved on at least several measures

DuPaul et al., 1994	n = 40 age 6-12 ADHD (n=23) or ADD	internalizing groups: high, med., low	behavior home school, lab; sustained attention, arithmetic	high int. group showed worse resp. in school and lab, but not on cognitive measures
Effron et al., 1997	n = 125 (114 boys) age 5-14.9 ADHD (80% combined type, DSM-IV)	baseline parent and teacher ratings, aggressive-delinquent behavior	?	severity of baseline measures predicts better response age, gender, socioeconomic status, and anxiety-depression not predictive
Elia et al., 1990	n = 31 boys age 6-12 ADDH	urinary epinephrine and metanephrine	parent, teacher, and physician assessments	urinary epinephrine and metanephrine increases with MPH did not correlate with resp.
Ferguson et al., 1976	n = "small" age 7-12 hyperactive	heart rate, skin conductance during baseline, reaction time task, and white noise	retrospective, from parent or physician comments in files	no consistent pattern between resp. & non-resp. groups
Ferguson & Trites, 1980	n = 79 boys age 7.5-12.5 hyperactive	neuropsych. exam, patient history and characteristics	attentional measures Conners' ratings global ratings	resp. were younger, lower IQ, less attentive, more physical abnormalities
	n = 25	EEG	(same as above)	abnormal EEG group had higher resp.
Gualtieri et al., 1982	n = 44 age 6-13 DSM-III	serum level of MPH, 2 dose levels	resp. & non-resp. group, as based on clinical impression	serum levels not different between resp. & non-resp. groups
Halliday et al., 1976	n = 42 (37 boys) age mean 9.5, SD 1.5 physician, teacher, and parent report	evoked potential variability and amplitude indices	pediatrician's evaluation (responder = greatly improved)	classified 32 of 42 correctly (76%)

Halliday et al., 1980	n = 15 age = 7.3 - 13.3 hyperactive	age, initial severity	parent and teacher ratings	older and higher initial severity predicts better dose response
Halliday et al., 1984	n = 20 age 7-13 hyperactive	visual ERP amplitude & latency	parent, teacher, & physician blind ratings	predicted resp. 91-100%, non-resp. 44-56%
Halperin et al., 1986	n = 80 age 6-12 pervasively hyperactive	behavior ratings, clinical EEG, neurological exam	change in Conners' scores, psychiatric global improvement	controlling for age and severity, neurological soft signs and EEG not predictive
Handen et al., 1994	n = 47 (31 boys), with IQ = 48 to 77 age 6-13 ADHD	sex, IQ, mental age, impulsivity-hyperactivity ratings, on-task behavior	school response (Conners' teacher rating scale, # of problems completed, % correct)	multiple R's .45 to .53
		hyperactivity ratings, race, impulsivity ratings, SES, conduct	laboratory response (task, Conners' scale, CPT)	multiple R's .47 to .67
Hicks et al., 1985	n = 44 (36 boys) age mean 8.4 (SD 1.75) ADD	placebo responding on 52 non-orthogonal measures	responding on the same 52 measures	placebo responses predict drug resp. for 47 of 52 measures
Hinshaw et al., 1989	n = 25 boys, 15 controls age 6-12 ADHD	aggressive, non-aggressive	observations of social behavior	aggression group did not predict response
Jonkman et al., 1998	n = 12 (8 resp., 4 non-resp.) age 10.3 (2.0) ADHD	plasma conc. of MPH enantiomers	mean P3 ERP amplitude increased from placebo to MPH	non-resp. had higher plasma conc. of both D- and L-<u>threo</u> enantiomers

Kidder, 1990	n = 107 boys age 6-16 suspected ADHD	WISC-R, full scale IQ & subtests	paired associate learning	D = 52%
Kimball, 1986	n = 17 boys age 6.6-11 DSM-II or DSM-III	clinical observations, tests of tactile sensory integration & vestibular function	paired associate learning	4 of 22 measures correlated with drug response, r's = .57, -.50, .65, and .69
Kinsbourne, 1985	n = 55 (29 responders) age ? ADD ?	SCR, heart rate, and MFFT	responding on the same measures	baselines affect amount of change
Klorman et al., 1988	n = 63 (19 aggressive, 20 borderline ADHD) age 6 - 12 ADHD cross-situational	3 groups: aggressive, non-aggr., and non-aggr. / borderline ADHD	parent / teacher ratings, EEG & behavioral measures during CPT-X and CPT-double	groups did not reliably differ
Klorman et al., 1994	n = 78 (34 ADD + aggression), 29 controls age 5.6-11.9 ADD	aggression group	Sternberg's memory scanning task, ERP measures	aggression group not predictive of response
Klorman et al., 1989	n = 43 (24 low, 19 high on aggression) age 6-12 ADHD cross-situational	high vs. low-aggression group (parent & teacher ratings)	CPT, ERPs during CPT, parent and teacher ratings	aggression group did not predict MPH response
Klorman et al., 1987	n = 12 age 12-19 ADD in adolescence & childhood	2 groups based on whether had stimulant therapy in childhood (n = 6) or not	parent, teacher, and self-report	childhood stimulant therapy did not predict adolescent resp.

Livingstone et al., 1992	n = 109 boys (internalizers externalizers, both, or neither) age 7-11 ADD	4 groups: ADD, ADD+int, ADD+ext, ADD+int + ext	teacher ratings	no effect of group, except that "both" shows worse response to low dose only
Loney, Prinz, et al., 1978	n = 84 boys age 6-12 hyperkinetic/MBD	age at referral, hyperactivity, & degree of perinatal complications	clinically rated improvement	multiple R = .50
Matier et al., 1992	n = 25 (14 aggressive), 13 controls age = 6.5 - 12 ADHD	physically aggressive or not (DSM-III-R symptoms for conduct disorder)	CPT (impulsivity, inattention, dyscontrol errors), and activity	dyscontrol errors and activity level decreased only in the non-aggressive group
McBride, 1988	n = 73 (53 boys) age 6-17 ADD (77% ADD-H)	Conners' ratings, sex, family history, physical exam, EEG, WISC-R	written comments and Conners' parent and teacher ratings, the child's own observations	younger age, male gender, higher IQ, and greater distractibility predicted better resp.
Nolan & Gadow, 1994	n = 34 (31 boys) age 5-13 ADHD	school behavior coded by trained observers	rating scales	r's .37 to .55
Pelham & Milich, 1991	n = 26 boys age mean 8.1 DSM-III-R	CPT, learning task, and teacher ratings	17 behavior measures, recreational and classroom	not predictive, either singly or in combination
Pelham et al., 1989	n = 24 (equal #'s boys and girls, matched for age and IQ) age = 5.5-11.3 ADD, ADD-H	sex	daily conduct, classroom behav., math, reading, seatwork, spelling, counselor & teacher ratings, peer interaction	no overall effect of sex or interaction of sex with drug on outcome measures
Pliszka, 1989	n = 43, 13 w/ anxiety age ? (similar across groups) ADHD	anxiety, conduct disorder, and oppositional/ defiant disorder	teacher ratings	only comorbid anxiety predicted a poor resp. to MPH

Prichep & John, 1990	n = 28 (16 resp.) age 6-12 learning disabled with or without ADHD	EEG neurometric profiles	Conners' ratings, global ratings, paired associate learning, & academic test	D = 82% (resp. 81%, non-resp. 83%)
Rapport et al., 1989	n = 45 boys age 5-12 ADHD	three weight groups: low 22-26 kg, med. 27-31 kg, high 32-36 kg	classroom observations, teacher ratings, academic measures	body weight did not predict drug response
Rapport et al., 1994	n = 76 (66 boys), 25 controls age 6-11 ADDH	placebo and 4 dose levels	attentional, academic, and behavioral ratings	failure to respond at lower dose predicts favorable response at higher dose
Rapport & Denney, 1997	n = 76 age ADDH	body weight	dose response curves, optimal dose by statistical analysis of change scores	body weight did not affect response
Shen & Wang, 1984	n = 78 (62 boys); 57 controls age 7-12 DSM-III	urinary MHPG	Conners' rating scales	decrease in MHPG excretion predicts positive resp.
Suffin & Emory, 1995	n = 46 (34 boys) age mean 12.4 DSM-III-R	EEG subgroups (frontal alpha excess, theta excess, hyper-coherent, other)	moderate or better Clinical Global Improvement (2 or 3), not always MPH	resp. and non-resp. groups were not differentiable
Sunohara et al., 1997	n = 13 resp, 13 non-resp, 13 controls age 11.4 +/- 1.2 ADHD	paired associate learning, errors on placebo; ERP	psychoeducational assessments and cognitive tasks (?)	paired associate and placebo not predictive; no ERP differences while off MPH on MPH, longer latencies in P3b and N2 ERP for non-resp.
Swanson et al., 1978	n = 53 (50 boys) age > 5, mean 10.2 hyperactive	anxiety	paired associate learning	anxiety predicts a worse response

Tannock et al., 1995	n = 40 (18 with anxiety) age 7-11 ADHD	anxiety group	activity level, working memory	comorbid anxiety but not learning disorder predicts worse response
Taylor et al., 1987	n = 38 boys age 6-10 referred; 26 found to meet DSM-III criteria	age, IQ, hyperactive home behavior and attentional measures, neurological exam	6 measures of behavior (ratings) and attention	clinical rating: D = 70% resp., 73% non-resp. hyperactivity: D = 81% resp., 68% non-resp.
Thomson, 1992	n = 336 (278 boys), much missing data age 3-16, mean 8.6 ADHD, ADD	neurological diagnosis, age, child behavior checklist (CBCL), WISC-R	based on Conners' parent and teacher ratings	D = 72% (75% resp., 59% non-resp.)
	n = 61, with complete data (?)	neurological diagnosis, CBCL, family structure	(same as above)	D = 89% (97% resp., 86% non-resp.)
	n = 36, with complete data (?)	WISC-R subtests, CBCL	(same as above)	multiple R = .59
Tirosh et al, 1993	n = 20 (16 boys) age 7-12 DSM-III	digit, word, visual tests derived from WISC-R, motor control, maze drawing	teacher ratings, parent ratings	placebo - drug r's .44-.71 (teacher) .20-.54 (parent) baseline-drug r's .30-.52 (teacher) .29-.42 (parent)
Varley & Trupin, 1982	n = 10 (7 boys), IQ's 48-77 age 4.5-15 DSM-III	IQ, sex, social class, ratings	Conners' parent & teacher ratings	5 of 10 responded, no predictors identified
Voelker et al., 1983	n = 46 (36 boys); 46 controls age 5-15 hyperkinetic	Personality Inventory for Children	home behavior ratings; retrospectively	D = 74% (78% resp., 68% non-resp.)

Young et al., 1995	n = 35 (21 boys) age 12.3 +/- 2.57 DSM-III-R	ERP measures of acute response (P3b amplitude)	physicians' clinical assessment (global ratings)	acute response above threshold or not predicted 81% of outcomes

Notes. CPT = continuous performance test; ext = externalizer; int = internalizer; MFFT = Kagan's (1966) Matching Familiar Figures Test; resp. = responders; SCR = skin conductance response; SRT = Selective Reminding Test; WISC = Weschler Intelligence Scale for Children; ? = information missing or unclear.

Participants = number & characteristics, age in years, and diagnosis.

Predictor Variables = independent variables used to discriminate between responders and non-responders (e.g., entered into the discriminant function)

Response measures = outcome measure(s) used to assess drug response.

Relationship = prediction effectiveness: D = percentage of correct classification of responders and nonresponders by a discriminant function (chance = 50%); r = simple or partial correlation with MPH response, R = multiple correlation.

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