

# Externalizing (ADHD) Behaviors & Academic Underachievement: Causal, Transactional, or Parallel Relationship?

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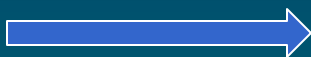
# Agenda

- Relation between ADHD & academic underachievement: Possible scenarios
- Academic & cognitive functioning in preschool children with ADHD
- Disentangling possible causal relations
- Evidence for cross-functional effects of intervention
- Implications for screening and intervention

# Relation between ADHD and Academic Underachievement: Possible Scenarios

- Early ADHD leads to concurrent and later academic difficulties
- Early academic difficulties leads to ADHD
- ADHD and academic difficulties are related to a third causal variable (e.g., brain functioning deficits)
- Aggression/conduct problems related to academic underachievement primarily through association with ADHD

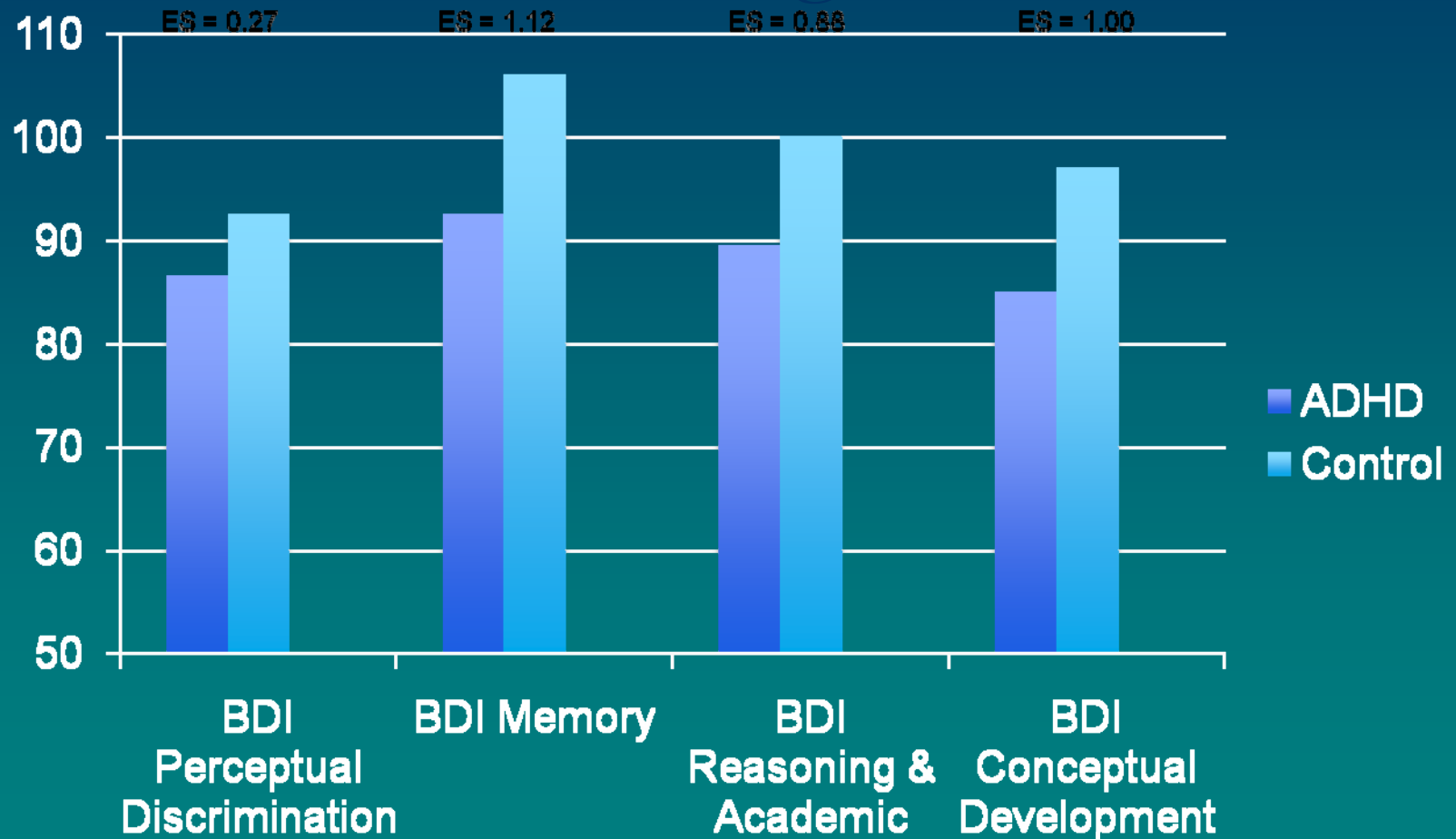
# Relation between ADHD and Academic Underachievement

- Currently available evidence points toward ADHD  academic underachievement & perhaps a common underlying cognitive deficit (?related to disinhibition?)
- Rapport et al. (1999) proposed a two-factor predictive model where the effects of ADHD on achievement were mediated by cognitive (e.g., memory) and behavioral (inattention/impulsivity) factors

# Young Children with ADHD: Two Samples

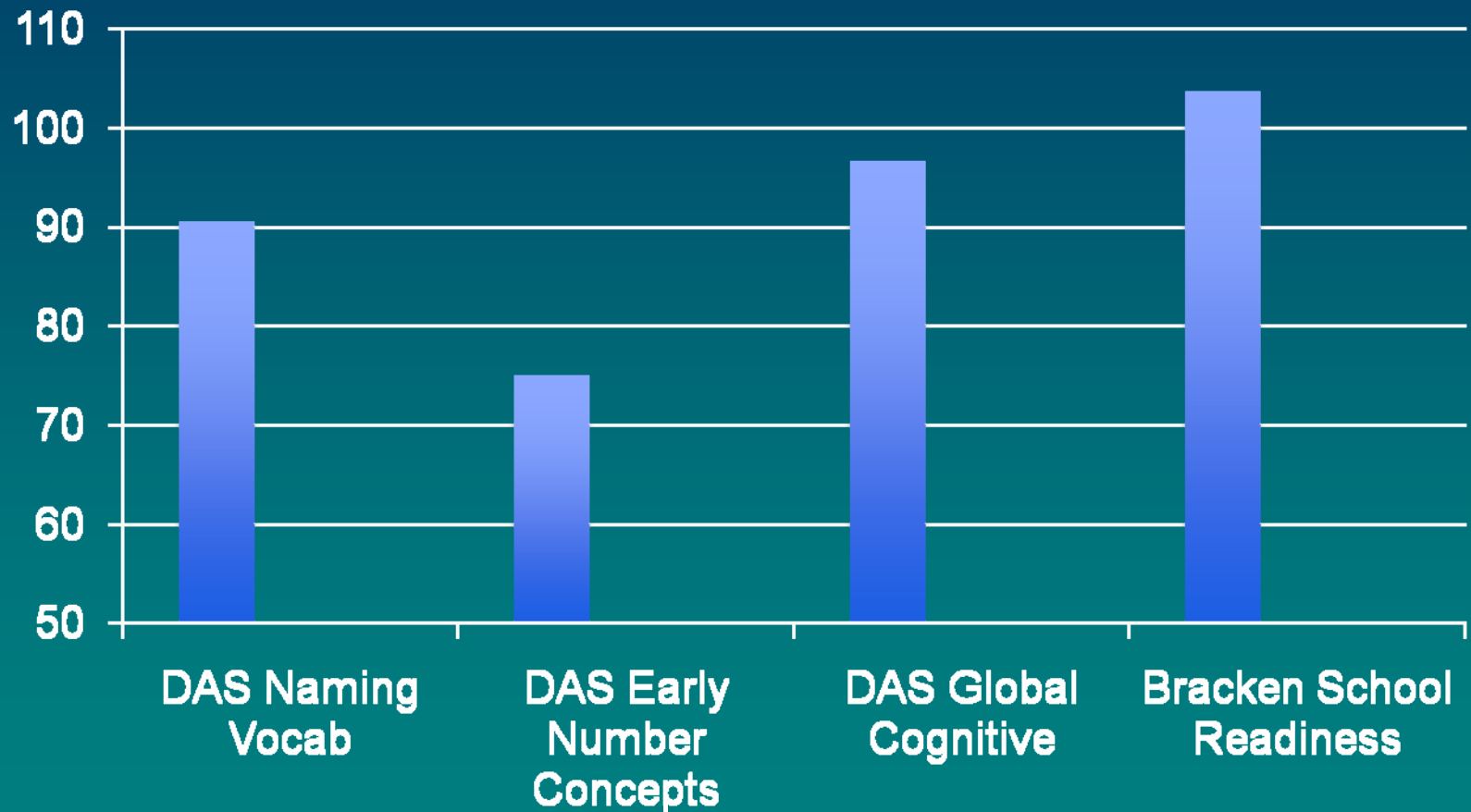
- DuPaul et al. (2001)
  - $N = 58$  children (50 boys) with ADHD
  - 66% Combined Type, >80% comorbid DBD
  - $N = 36$  control children (20 boys)
  - 3 to 5 years old ( $M = 4.0$ ,  $SD = 0.9$ )
  - Predominantly White and middle
- Kern et al. (2007)
  - $N = 135$  children with ADHD (106 boys)
  - 63% Combined type, 76% comorbid ODD
  - 3 to 5 years old ( $M = 4.0$ ,  $SD = 0.7$ )
  - Predominantly White and middle class

# Young Children with ADHD: Academic & Cognitive Skills



From DuPaul et al. (2001)

# Young Children with ADHD: Academic & Cognitive Skills



From Kern, DuPaul et al. (2007)

# Young Children with ADHD: Academic & Cognitive Skills

- Between 16 to 20% of young children with ADHD 1SD or below on Bracken school readiness & total test score
- Between 18 to 21% of young children with ADHD 1SD or below on WJ-III Letter-Word ID and Applied Problem-Solving

# Young Children with ADHD: Academic and Cognitive Skills

- Prediction of School Readiness
  - Criterion: Bracken School Readiness Composite Score
  - Predictors: DAS Global Cognitive Ability, EC-HOME Academic Stimulation & Learning Materials, ADHD-IV Inattention & Hyp/Imp scores
  - $R^2 = 0.44, p < .001$
  - Significant predictors: DAS GCA, ADHD-IV IA, ADHD-IV HI (inverse)

# Young Children with ADHD: Risk for Academic Impairment

- $N = 255$  4 to 6 y.o. children with ADHD and matched comparisons followed over 3 yrs
- Children meeting full cx for ADHD significantly more likely than those meeting situational cx or normal controls to evidence academic impairment
  - Teacher ratings of classroom academic work
  - Placement in special education (>30%)
- Group differences evident after controlling for IQ, co-occurring psychopathology, and other demographic characteristics

# Early ADHD & Academic Achievement: Tentative Conclusions

- Approx. 20% of preschool-aged children with ADHD exhibit concurrent achievement problems (measured at a global level)
- Possible that additional children experience more specific and isolated problems (e.g., counting, phonemic awareness)
- IQ + early IA symptoms robust predictors of school academic readiness
- Young children with ADHD, especially those with IA subtype, at significant risk for later academic problems (Masseti et al., 2008)

# Early ADHD & Academic Achievement: Tentative Conclusions

- By late elementary school, the vast majority (up to 90% by some estimates) of children with ADHD will show academic impairment
- Most likely conclusion: early ADHD symptoms, especially IA, lead to concurrent and later academic impairment that manifests at school entry or early in elementary school
- Possible that academic impairment exacerbates ADHD symptoms which, in turn, lead to greater academic impairment

# ADHD & Academic Underachievement: Disentangling Possible Causal Relations

- Identify sample of young children with ADHD alone (no apparent academic deficits)
  - One grp receives behavioral intervention alone
  - Second grp receives academic intervention alone (as a prevention strategy)
  - Third grp is no treatment control (for maturation and history effects)
  - Examine changes in behavioral and academic functioning

# ADHD & Academic Underachievement: Disentangling Possible Causal Relations

- Identify sample of young children with academic deficits alone (no ADHD)
  - One grp receives behavioral intervention alone (as a prevention strategy)
  - Second grp receives academic intervention alone
  - Third grp serves as no treatment control (for maturation and history effects)
  - Examine changes in behavioral and academic functioning

# ADHD & Academic Underachievement: Disentangling Possible Causal Relations

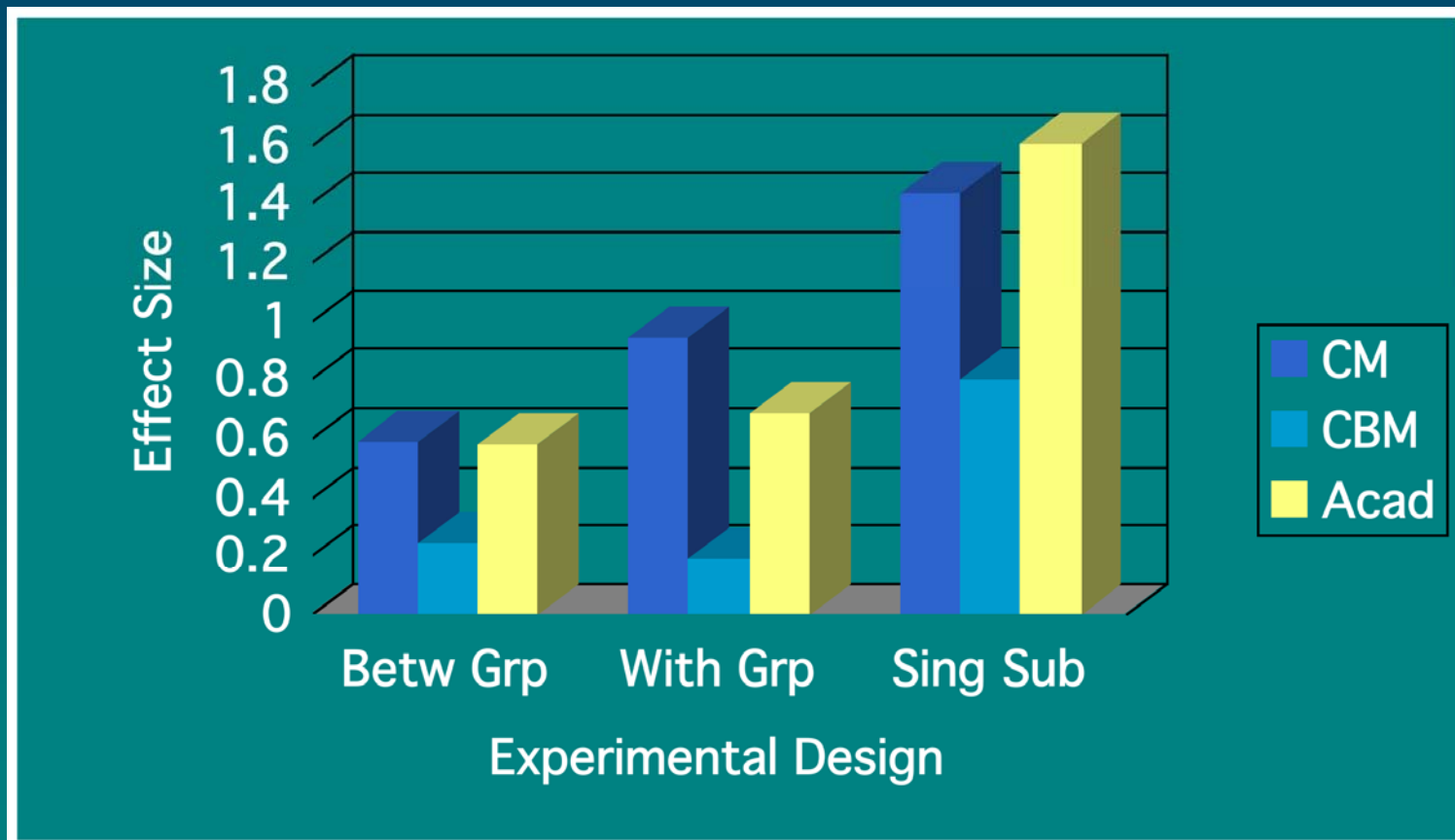
- Identify sample of young children with ADHD and concurrent achievement deficits
  - One grp receives behavioral intervention alone
  - Second grp receives academic intervention alone
  - Third grp is no treatment control
  - Examine changes in behavioral and academic functioning
- At present, very little research has been conducted along these lines with young children
- Some lines of evidence to suggest cross-functional effects of intervention, particularly behavioral effects for academic intervention
- At the same time, limited evidence for impact of tx directed at reducing ADHD symptoms (e.g., stimulants) on academic outcome

# Young Children with ADHD: Changes in Academic Skills Following Intensive Behavioral Intervention

- At 24 mos. (immediately post-tx):
  - Positive linear slope ( $p < .05$ )
    - ❖ DIBELS Initial Sound Fluency, Letter Naming Fluency, Phoneme Segmentation Fluency
    - ❖ WJ-III Letter Word Identification, Calculation
    - ❖ ENSA Quantity Concepts
  - Other than ENSA, no significant difference relative to slopes obtained by parent education only group (less intensive intervention)
  - Trajectories different, however, from more typical progression towards greater achievement problems over time

DuPaul, Kern et al. (in  
preparation)

# School-based Intervention for ADHD: Effects on Behavior (DuPaul & Eckert, 1997)



# Development of Screeners and Interventions Related to School Readiness

- Screening of academic functioning in young children with ADHD if IA symptoms are severe and/or family hx of learning difficulties and/or signs of developmental delay
- Universal intervention with all young children with ADHD that includes literacy/numeracy activities that should be happening for all children
- Stepped care approach with additional levels of intervention depending on response to prior levels (i.e., intensive tx given to those in greatest need based on response)
- Need for interventions to concurrently address symptoms AND impairment to obtain greatest impact