



# Adaptive Behavior and Psychiatric Symptoms using the Behavior Assessment System for Children – Version 3:

## Results from the ABC-CT Feasibility Study

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### Introduction

- Evaluations of school-aged children with autism spectrum disorder (ASD) include both core symptoms (e.g. social communication) and co-occurring behaviors (e.g. adaptive behavior (1) and psychiatric symptoms (3)).
- Assessing multiple domains of behavior often requires individualized standardized assessments which can be burdensome on families (4).
- The Behavior Assessment System for Children- Version 3 (BASC-3) is a comprehensive rating scale that assays multiple domains of behavior (2).
- We asked whether the BASC-3 can differentiate ASD from typically-developing (TD) school-aged children and whether it demonstrates convergence with more commonly-used measures of adaptive functioning and psychiatric symptoms.

### Objectives

- Investigate group differences in adaptive behavior and psychiatric symptoms in children with ASD and TD using the BASC-3 composite scores.  
**Hypothesis:** Children with ASD will show decreased adaptive behavior and increased psychiatric symptoms compared to TD.
- Examine convergent validity of the BASC-3 in children with ASD by comparing this measure to the Vineland Adaptive Behavior Scales, Second Edition (VABS-II) parent interview and the Child and Adolescent Symptom Inventory-5 (CASI-5)/Early Childhood Inventory-5 (ECI-5).  
**Hypothesis:** The BASC-3 domains will correlate to corresponding VABS-II, CASI-5/ECI-5 domains.

### Methods

- Participants:**
- Enrolled in the Autism Biomarkers Consortium for Clinical Trials Study (ABC-CT), a multi-site feasibility study including behavioral and experimental measures
  - Eligibility:
    - ASD met criteria on the Autism Diagnostic Observation Schedule-II Module 1, 2, or 3 (ADOS-II), Autism Diagnostic Interview-Revised (ADI-R)
    - TD screened negative for psychiatric disorders
    - Participants included in this sample completed the BASC-3, CASI-5/ECI-5 and VABS-II measures

	Enrolled in ABC-CT	Included in Sample	Gender	Age (years) M(SD)	Best IQ - Full Scale or Ratio Differential Abilities Scales-II M(SD)	ADOS-II Severity Score M(SD)
ASD	n=25	n=22	17 male (77%), 5 female (23%)	8.03(2.28)	93.09(19.41)	14.82 (4.54)
TD	n=26	n=26	17 male (65%), 9 female (35%)	6.58 (1.98)	114.08(9.34)	N/A

#### Questionnaires and Interviews:

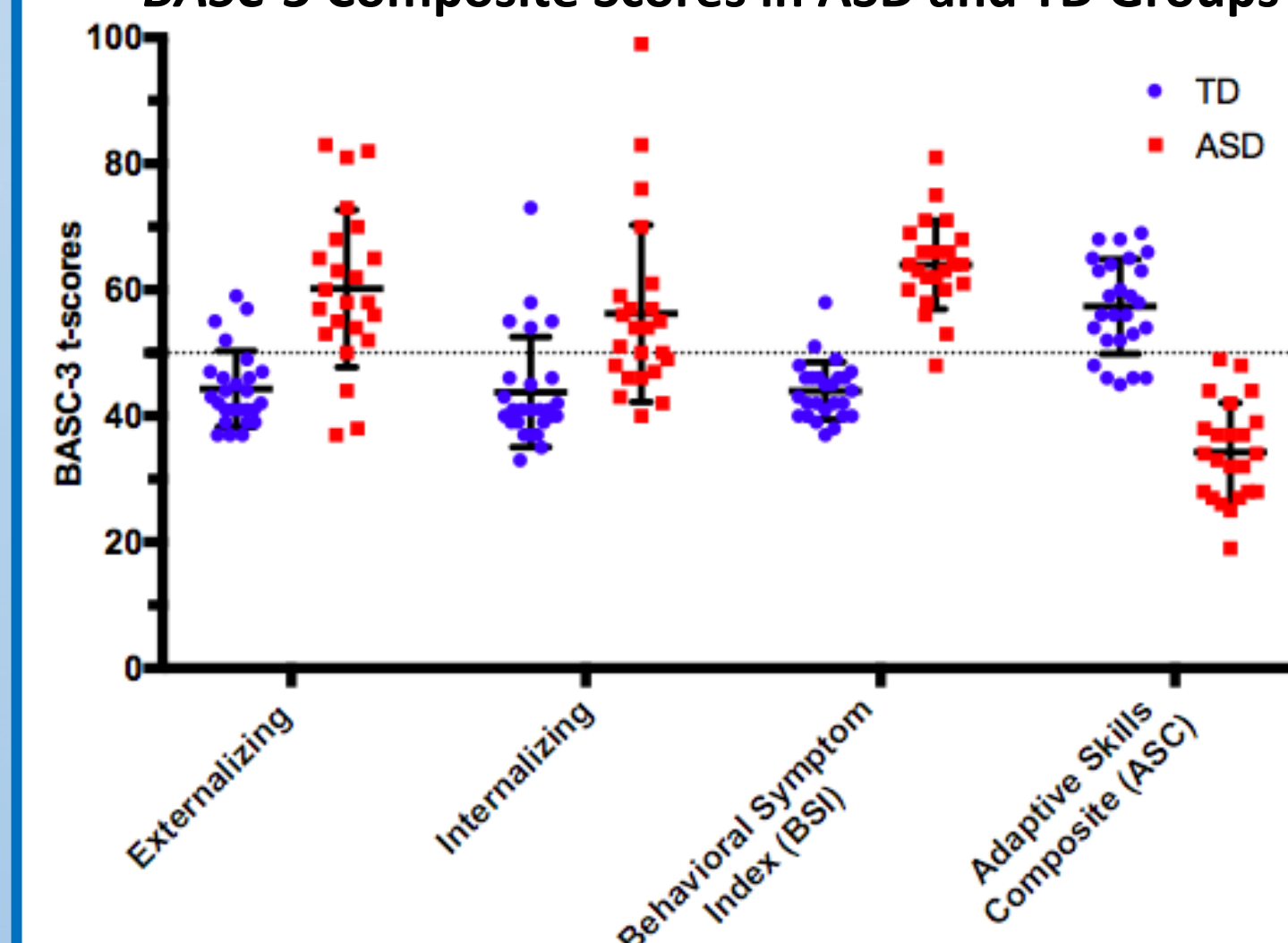
- BASC-3:** parent rating scale to evaluate adaptive and challenging social and emotional behaviors across community and home settings (2)
  - Comprehensive scoring includes: composite scales (i.e. internalizing problems), clinical scales (i.e. depression) adaptive scales (i.e. social skills), content scales (i.e. executive functioning) and clinical indices (i.e. Autism probability)
  - 10-20 minutes
  - 175 questions
- CASI-5/ECI-5:** parent rating scale based in DSM-5 to assess symptoms related to various psychiatric disorders
  - 10-20 minutes
  - 173 questions
- VABS-II (Survey Interview Form):** parent interview to assess adaptive behaviors across the lifespan
  - 30-60 minutes

#### Statistical Plan:

- Aim 1: Independent sample t-tests to examine group differences
- Aim 2: Correlations to examine convergent validity

### Results Aim 1

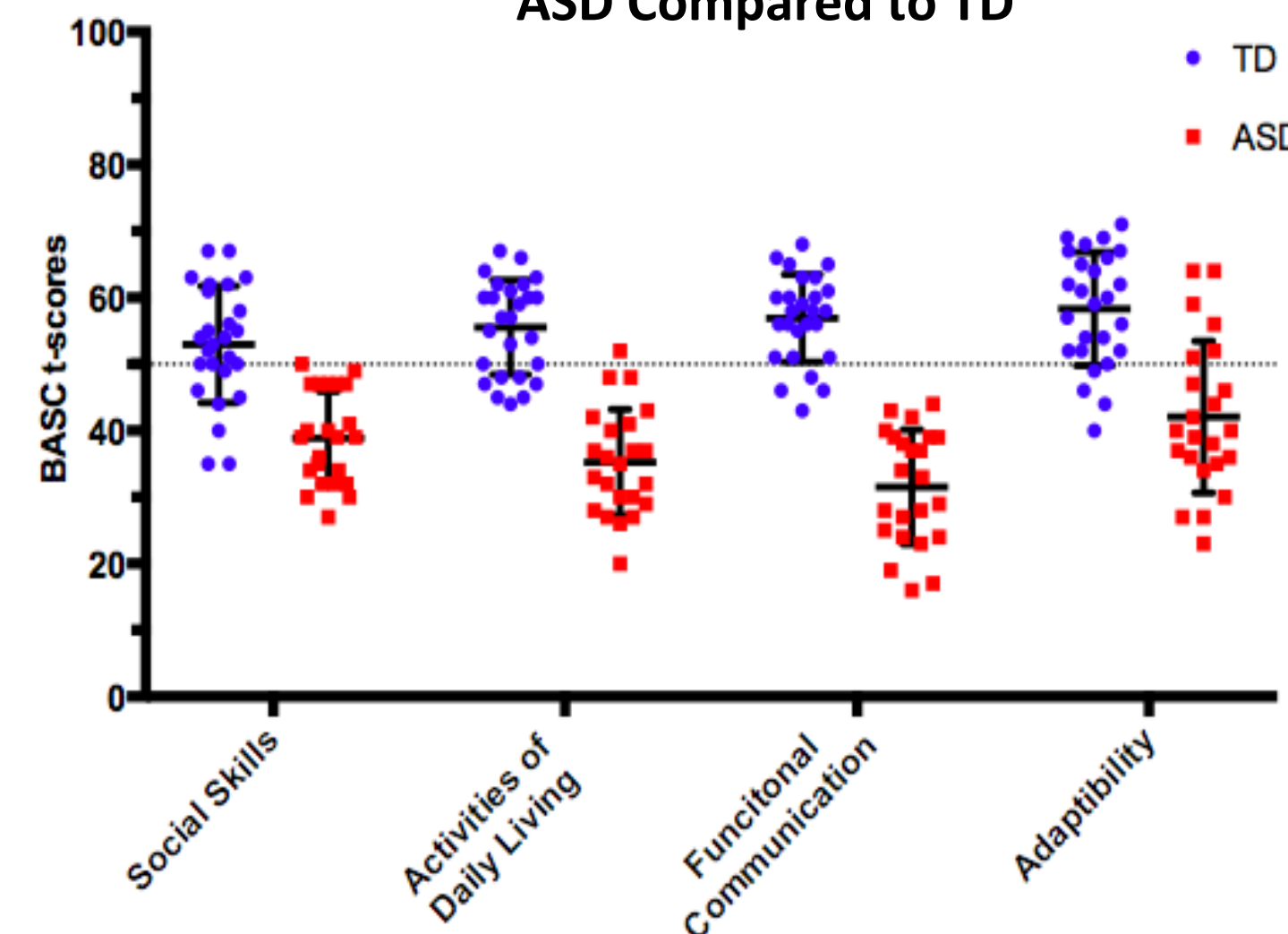
BASC-3 Composite Scores in ASD and TD Groups



BASC-3 Composite	Group Differences (t-test)
Externalizing	t(30.834)=-5.788, p<.001
Internalizing	t(47)=-3.775, p<.001
Behavioral Symptom Index (BSI)	t(47)=-11.965, p<.001
Adaptive Skills Composite (ASC)	t(47)=10.558, p<.001

### Results Aim 1 cont.

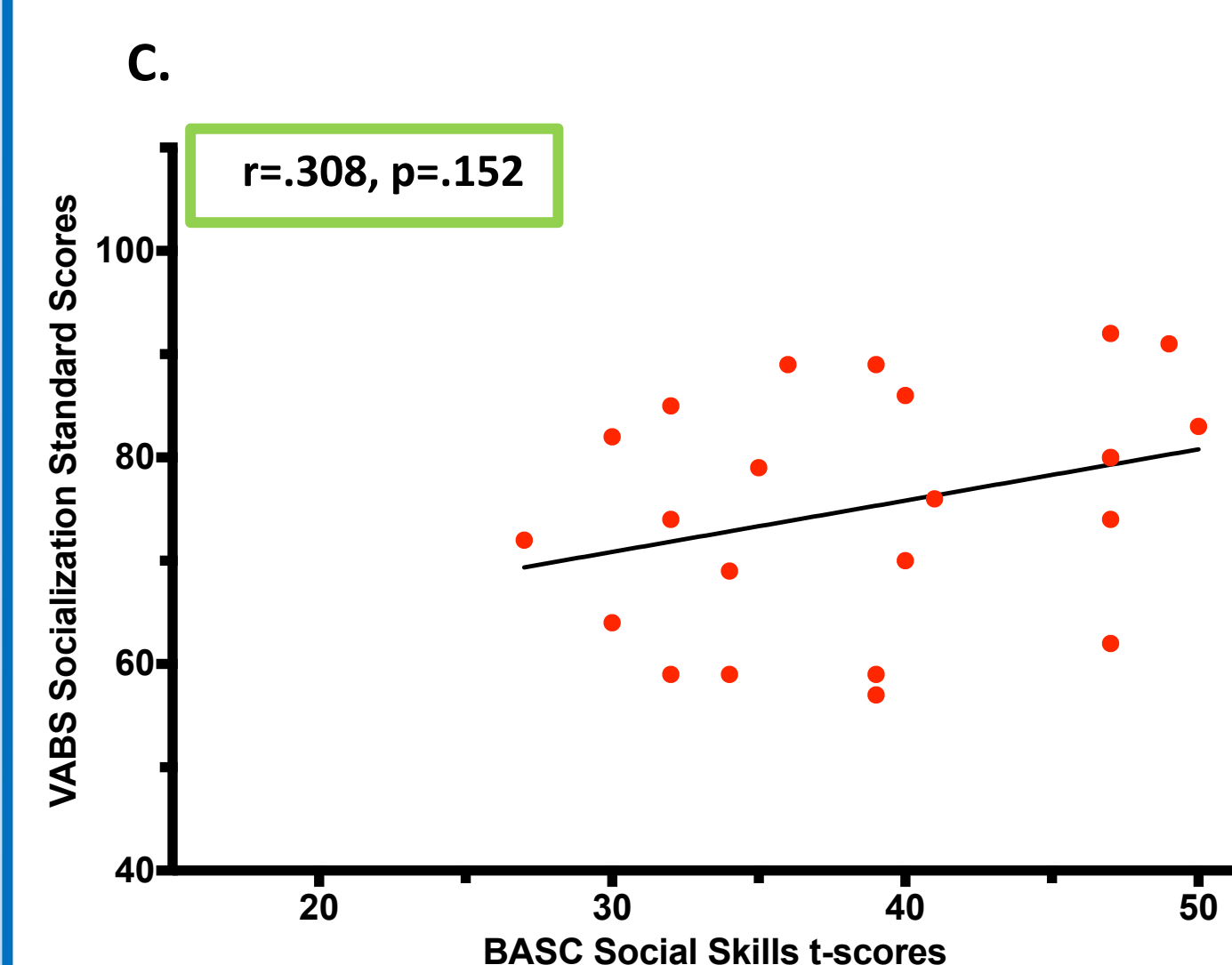
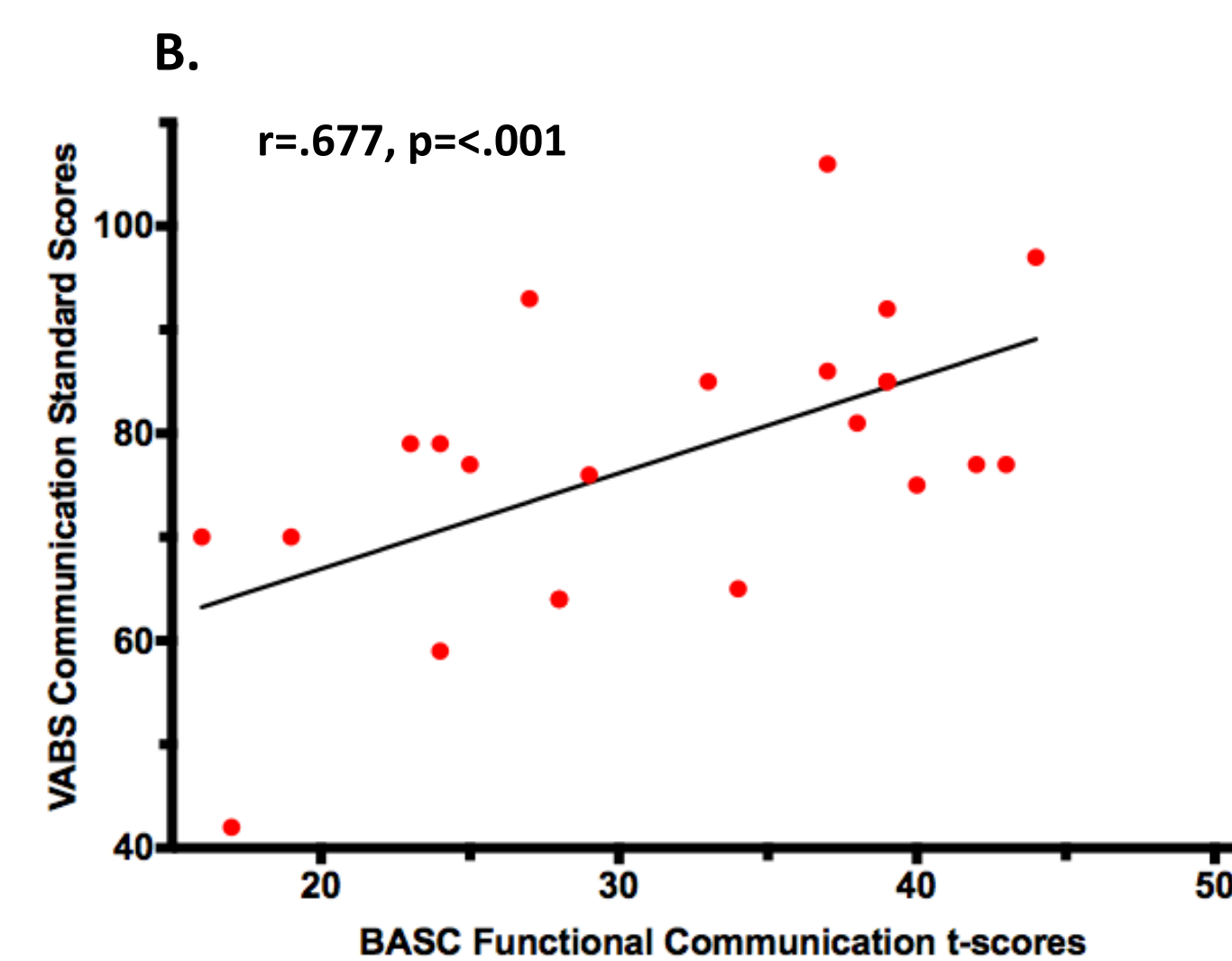
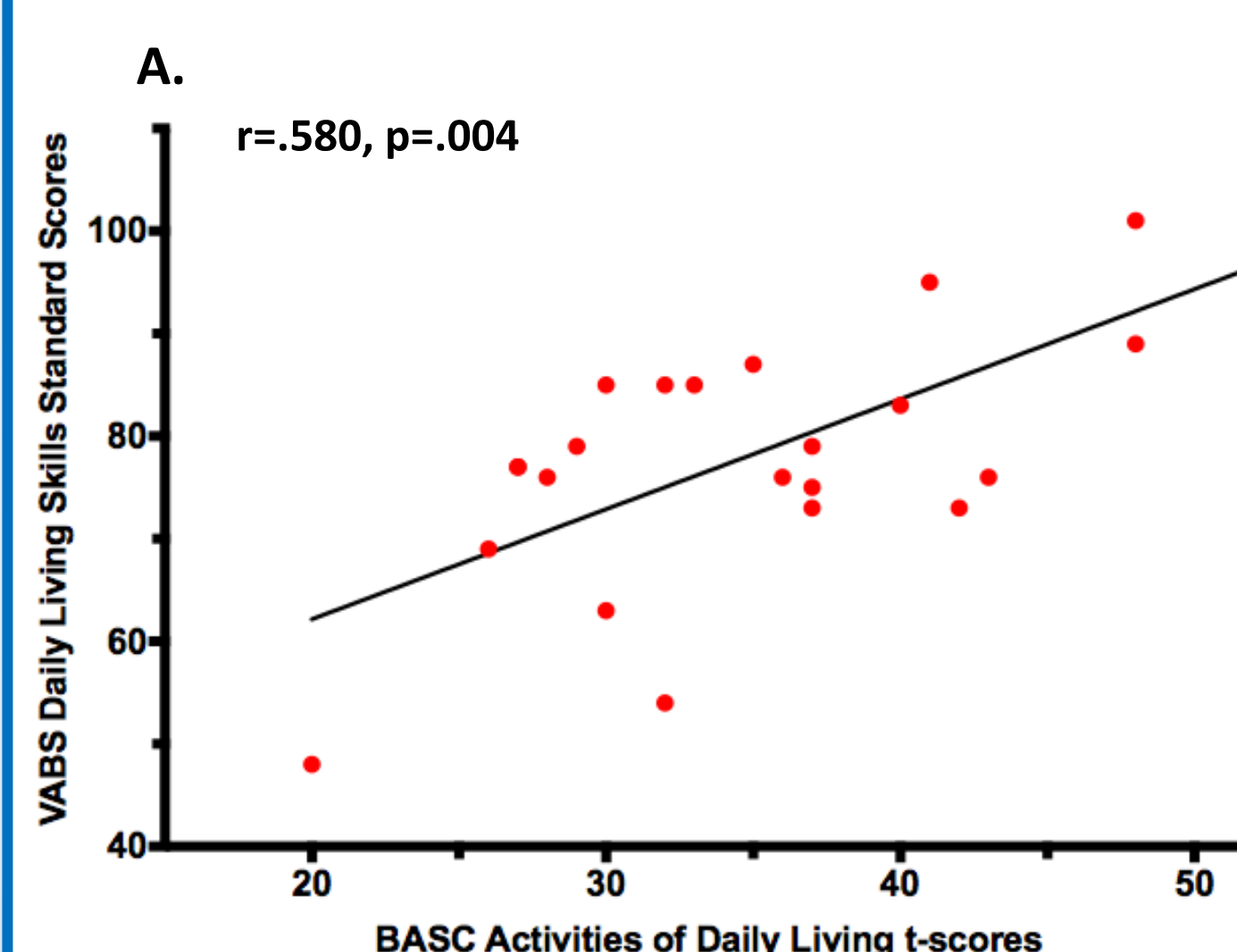
BASC-3 Adaptive Skills Composite (ASC) Domain Scores in ASD Compared to TD



ASC Domain	Group Differences (t-test)
Social Skills	t(47)=6.166, p<.001
Activities of Daily Living	t(47)=9.425, p<.001
Functional Communication	t(40.99)=11.453, p<.001
Adaptability	t(47)=5.684, p<.001

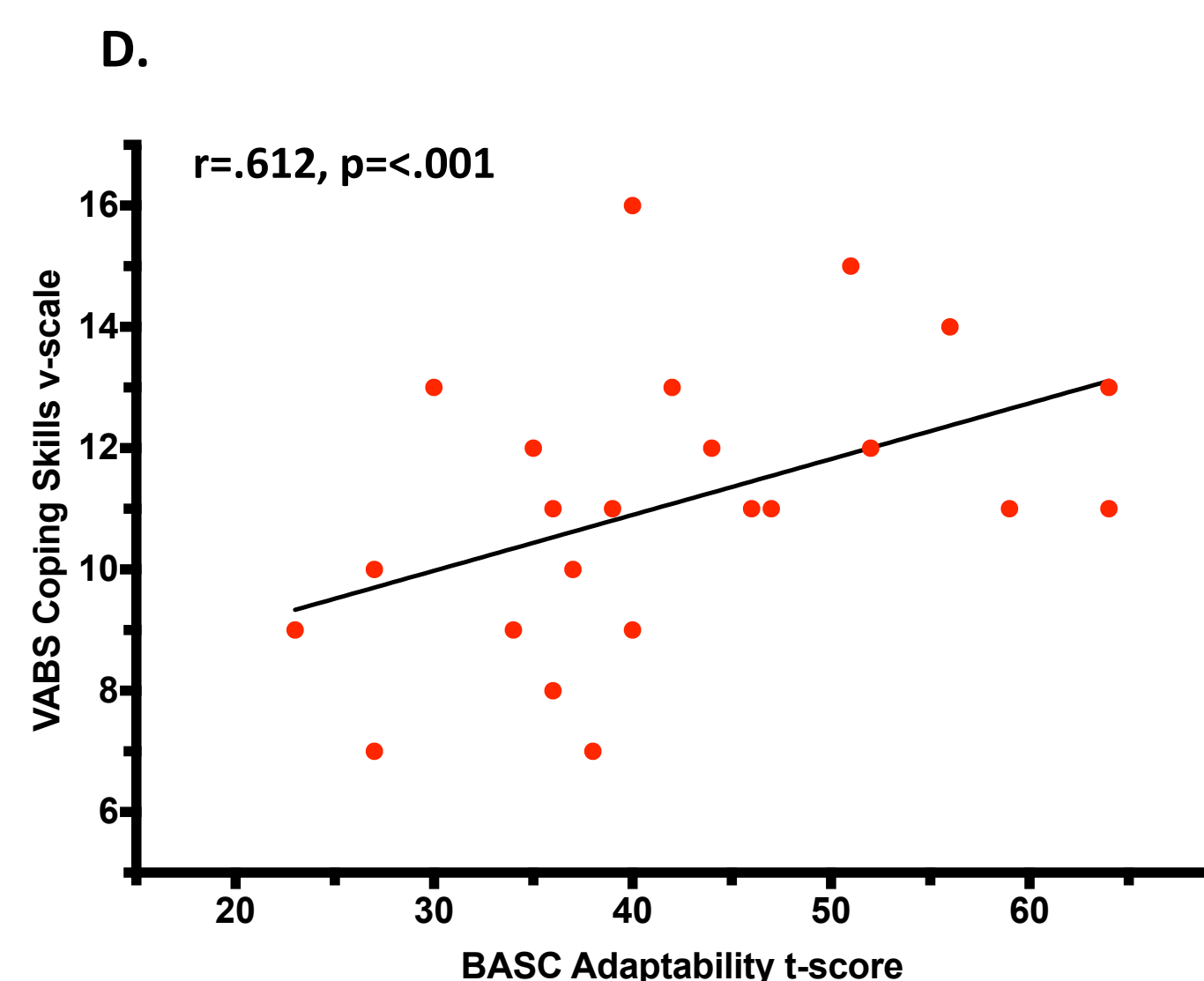
### Results Aim 2a

Question Sample (VABS-II/BASC-3)	A. Communication/Functional Communication	B. Daily Living Skills/ Activities of Daily Living	C. Socialization/ Social Skills
VABS-II	-Tells about everyday experiences (i.e., routine) in detail -Identifies all alphabet letters	-Understands what to do in dangerous situations -Does at least two simple household chores	-Avoids being manipulated, dominated or taken advantage of by others -Controls anger or hurt feelings when given constructive criticism.
BASC-3	-Is clear when telling about personal experiences -Says all letters of the alphabet when asked	-Acts in a safe manner -Organizes chores and tasks well	-Shows interest in others' ideas. -Begins conversations appropriately



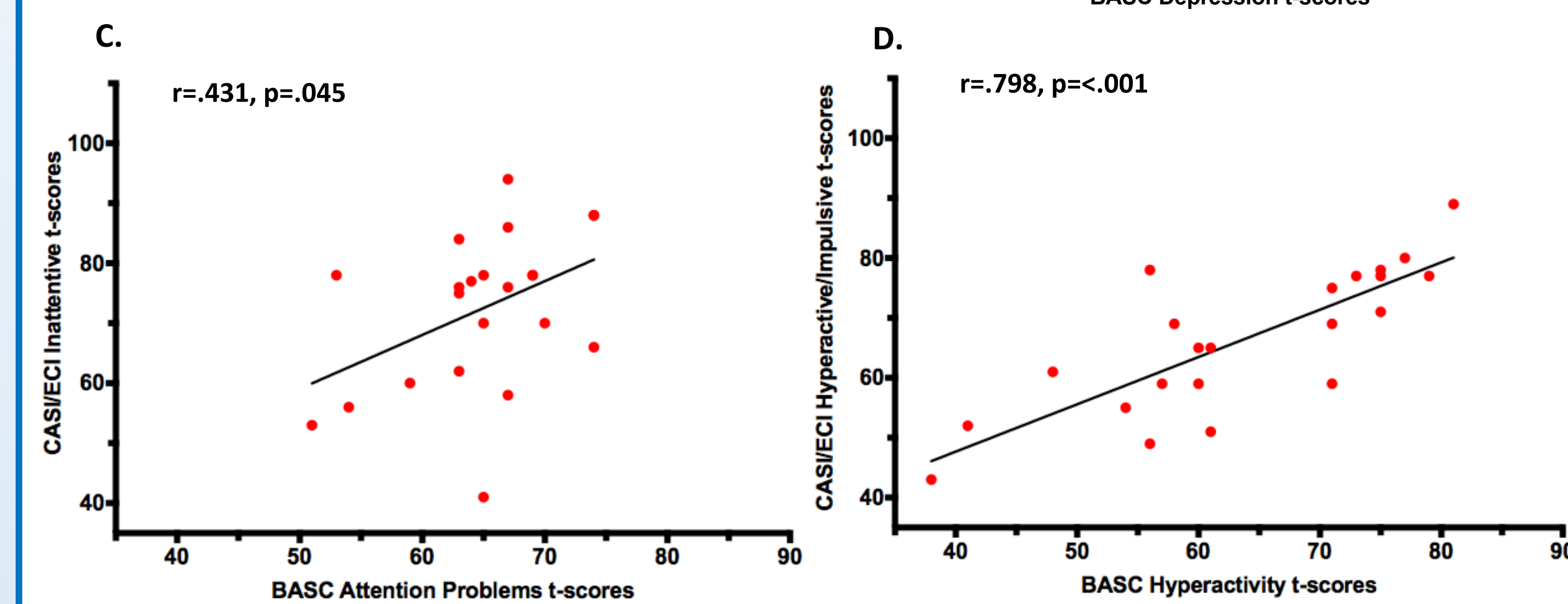
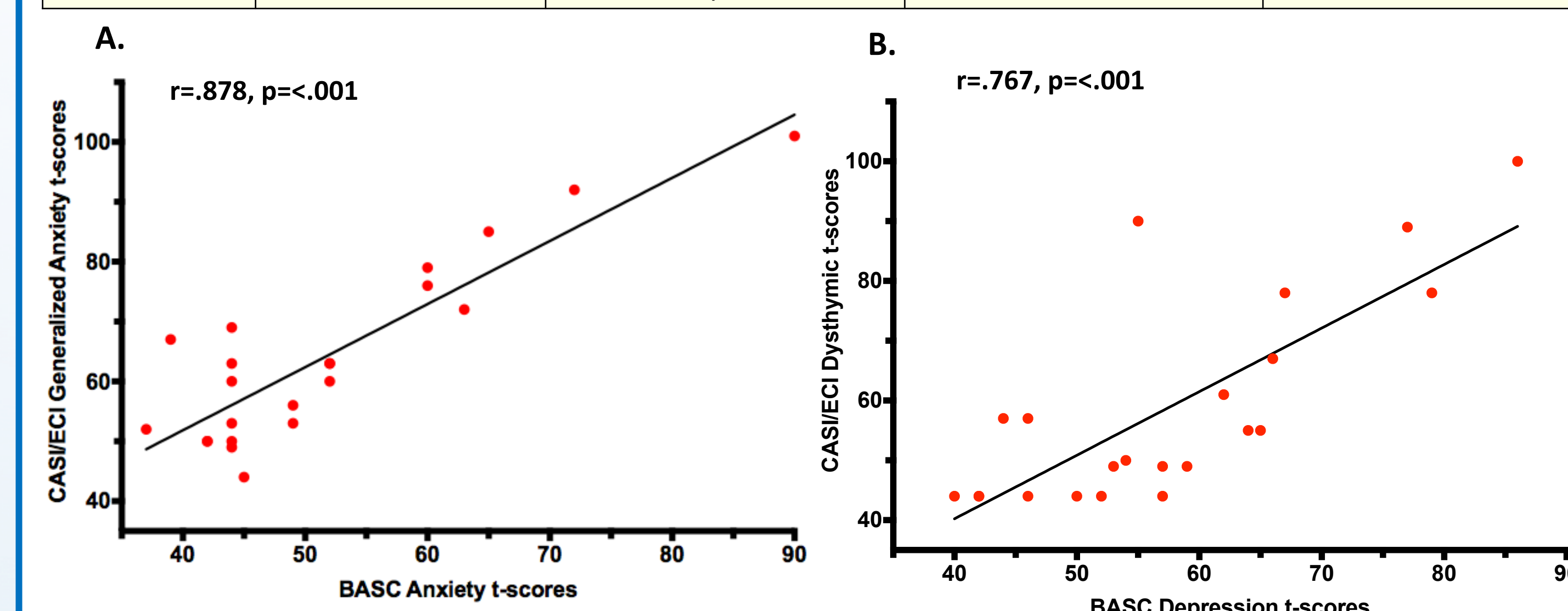
The BASC-3 includes an Adaptability domain within the ASC that qualitatively overlaps with the Coping Skills sub-domain within VABS-II Socialization domain.  
**Hypothesis:** The BASC-3 Adaptability domain will correlate with VABS-II Coping Skills sub-domain.

Question Sample (VABS-II/BASC-3)	D. Coping Skills Sub-Domain/Adaptability
VABS-II	-Handles changes in routine without becoming overly distressed -Recovers quickly from a minor setback or disappointment
BASC-3	-Adjusts well to changes in routine. -Recovers quickly from a setback



### Results Aim 2b

Question Sample	A. Generalized Anxiety/Anxiety	B. Dysthymic/Depression	C. Inattentive/Attention Problems	D. Hyperactive-Impulsive/Hyperactivity
CASI-5/ECI-5	-Cannot get distressing thoughts out of his/her mind.	-Talks about death or suicide -Has little confidence, feels inferior to others, or is very self-conscious.	-Is easily distracted by other things going on. -Does not pay attention to close details or makes careless mistakes.	-Interrupts or intrudes on other people's activities. -Is "on the go" or acts as if "driven by a motor."
BASC-3	-Worries about making mistakes.	-Says "I want to die" or "I wish I were dead." -Seems lonely.	-Is easily distracted. -Has trouble concentrating.	-Interrupts others when they are speaking. -Is in constant motion.



### Conclusions

#### Summary of Results:

- The following BASC-3 domains within the ASC positively correlated with corresponding VABS-II domains:
  - Functional Communication (BASC-3) & Communication (VABS-II)
  - Daily Living Skills (BASC-3) & Activities of Daily Living (VABS-II)
- The Social Skills domain of the BASC-3 did not correlate with the Socialization domain of the VABS-II. However, the BASC-3 Adaptability domain was positively related to the VABS-II Coping Skills sub-domain.
- The following BASC-3 psychiatric symptom domains positively correlated with corresponding CASI-5/ECI-5 domains:
  - Anxiety (BASC-3) & Generalized Anxiety (CASI-5/ECI-5)
  - Depression (BASC-3) & Dysthymic (CASI-5/ECI-5)
  - Attention Problems (BASC-3) & Inattentive (CASI-5/ECI-5)
  - Hyperactivity (BASC-3) & Hyperactive-Impulsive (CASI-5/ECI-5)

#### Conclusions:

- The BASC-3 differentiated children with ASD compared to TD across all Composite scores.
- The BASC-3 Adaptive Skills Composite domains demonstrate convergent validity with the VABS-II, with the exception of Social Skills. BASC-3 Social Skills may be representing a more narrow set of behaviors than VABS-II Socialization, which is an important consideration when using this measure in ASD.
- In settings where multiple domains need to be assessed in a time-efficient manner, the BASC-3 may be an appropriate alternative to individualized assessments.

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### Acknowledgements

We thank the National Institute of Health for funding this study. Grant NIMH# 1U19MH108206-01, PI: McPartland. We greatly appreciate all of the families who participated in this research across study sites (Yale University, University of Washington, Boston Children's Hospital, Duke University).