Uncovering the Behavioral and Cognitive Aspects of Autism Spectrum Disorders.

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Disclosures

Core Group Discussion → Deeper Learning

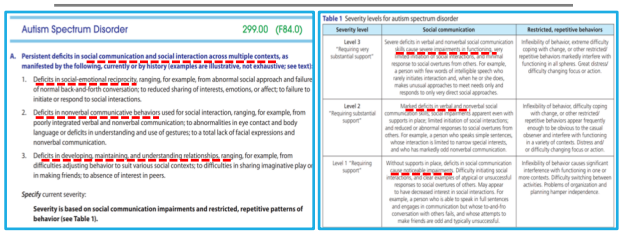
- **C**oach – Help the group decide what to do
- **O**rganizer – Have your group discuss the case of Manuel
- **R**ecorder – Keep notes and speak for the group
- **E**nergizer – Focus the group !

Topics for Today

Diagnosis
- Behavioral symptoms define the disorder based on DSM-5

Description of the Individual
- Assessment of the Behaviors related to ASD
- Determining if there is a Cognitive Processing Component
  - Cognitive profiles for those with ASD, ADHD, and SLD
- Evaluate Social Communication and Social Interactions
- Ruling out Intellectual Disability
  - A *fair and equitable* way to assess ability for students who may have Autism
- Quantifying "Significant Impairment"

DSM-5™ Diagnostic Criteria



Autism Spectrum Disorder 299.00 (F84.0)

A. **Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):**

1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.
3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

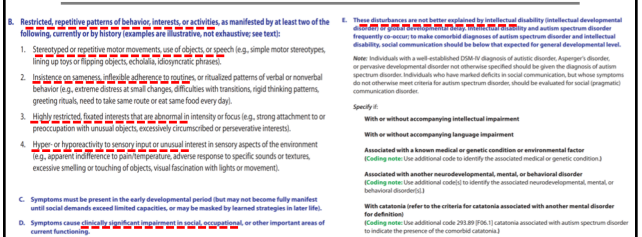
Specify current severity:

Severity is based on social communication impairments and restricted, repetitive patterns of behavior (see Table 1).

Table 1 Severity levels for autism spectrum disorder

Severity level	Social communication	Restricted, repetitive behaviors
Level 3 "Requiring very substantial support"	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.	Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.
Level 2 "Requiring substantial support"	Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.	Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.
Level 1 "Requiring support"	Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.	Inflexibility of behavior causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.

DSM-5™ Diagnostic Criteria



B. **Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):**

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypes, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).
3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

C. **Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).**

D. **Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.**

E. **These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.**

Note: Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Specify if:

With or without accompanying intellectual impairment

With or without accompanying language impairment

Associated with a known medical or genetic condition or environmental factor
(Coding note: Use additional code to identify the associated medical or genetic condition.)

Associated with another neurodevelopmental, mental, or behavioral disorder
(Coding note: Use additional code(s) to identify the associated neurodevelopmental, mental, or behavioral disorder(s).)

With catatonia (refer to the criteria for catatonia associated with another mental disorder for definition)
(Coding note: Use additional code 293.89 [F06.1] catatonia associated with autism spectrum disorder to indicate the presence of the comorbid catatonia.)

IF Diagnosis is Based on DSM-5 Why do More?

To understand the unique expression of ASD and to determine the best intervention targets and options

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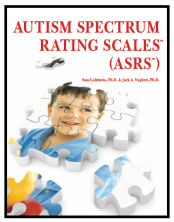
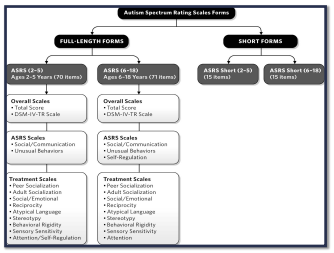
Autism Spectrum Rating Scales



Goldstein & Naglieri (2009)



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Factor Analytic Results

- 2-5 Year Olds a two-factor solution for parent and teacher raters
  - **Factor 1:** items related to socialization and communication (e.g., keep a conversation going, understand how someone else felt) - **Social/Communication**
  - **Factor 2:** items related to behavioral rigidity (e.g., insist on doing things the same way each time), stereotypical behaviors (e.g., flap his/her hands when excited), and overreactions to sensory stimulation (e.g., overreact to common smells)- **Unusual Behaviors**

6-18 Year Olds a three-factor solution for parent and teacher raters

- **Factor 1:** items related to both socialization and communication -**Social/Communication**
- **Factor 2:** items related to behavioral rigidity, stereotypical behaviors and overreactions to sensory -**Unusual Behaviors**
- **Factor 3**: items related to attention problems (e.g., become distracted), impulsivity (e.g., have problems waiting his/her turn), and compliance (e.g., get into trouble with adults, argue and fight with other children) -**Self-Regulation**.

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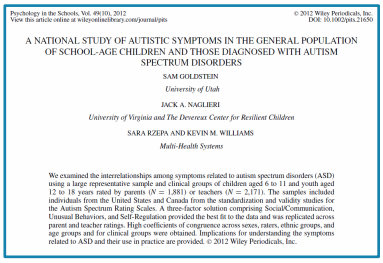

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A NATIONAL STUDY OF AUTISTIC SYMPTOMS IN THE GENERAL POPULATION OF SCHOOL-AGE CHILDREN AND THOSE DIAGNOSED WITH AUTISM SPECTRUM DISORDERS

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SARA RZEPA AND KEVIN M. WILLIAMS
Multi-Health Systems

We examined the interrelationships among symptoms related to autism spectrum disorders (ASD) using a large representative sample and clinical groups of children aged 6 to 11 and youth aged 12 to 18 years rated by parents ($N = 1,881$) or teachers ($N = 2,171$). The samples included individuals from the United States and Canada from the standardization and validity studies for the Autism Spectrum Rating Scales. A three-factor solution comprising Social/Communication, Unusual Behaviors, and Self-Regulation provided the best fit to the data and was replicated across parent and teacher ratings. High coefficients of congruence across sexes, raters, ethnic groups, and age groups and for clinical groups were obtained. Implications for understanding the symptoms related to ASD and their use in practice are provided. © 2012 Wiley Periodicals, Inc.

For More on Factor Analysis of ASRS

- No differences across sexes, raters, ethnic groups and age for typical and clinical samples

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Importance of a National Norm

- The way we calibrate a psychological test or rating scale score has a direct impact on the reliability and validity of the instrument
- The composition of the comparison and characteristics of the group is especially important whenever diagnostic decisions are being made.
- Why compare children's scores to a nationally representative sample?

Psychometric issues for Autism rating scales is provided in the chapter by Naglieri & Chambers in *Assessment of Autism Spectrum Disorders* (Goldstein, Naglieri, & Ozonoff, 2009)

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Importance of a National Norm

- What is the problem with not having a national norm?
  - You don't know how typical children perform
    - Typical means a wide variety of individuals who vary on important demographic variables
- What is the problem with not having a standard score like a T-score (mean of 50 and *SD* of 10)?
  - You don't know how similar a child's behavior is in relation to what is typical
    - Data from Naglieri, J. A. (2012). Psychological Assessment by School Psychologists: Opportunities and Challenges of A Changing Landscape. In K. Geisinger & B. A. Bracken (Eds.) *APA Handbook of Testing and Assessment in Psychology*. Washington, D.C.: American Psychological Association.

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Diagnostic Reference Groups

- I studied the differences between results when using a nationally representative sample versus a sample of children identified as having Autism as a reference group
- Raw score to standard score (T-scores) conversion table was constructed based on two different reference groups
  - **Nationally representative sample** N = 1,828 (See Goldstein & Naglieri (2009) for more details about the normative sample
  - **Individuals with ASD** (N = 243) diagnosed with Autism (*n* = 137), Asperger Syndrome (*n* = 80), or Pervasive Developmental Disorder-Not Otherwise Specified (*n* = 26) made by a qualified professional (e.g., psychiatrist, psychologist) according to the DSM-IV-TR (APA, 2000) or ICD-10 (WHO, 2007)) using appropriate methods (e.g., record review, rating scales, observation, and interview).

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T Scores: Higher = more symptoms of ASD

Raw Score	ASD Comparison	National Comparison
170	59	82
165	58	81
160	57	80
155	56	78
150	54	77
145	53	75
140	52	74
135	51	73
130	50	71
125	49	70
120	48	69
115	47	67
110	46	66
105	45	64
100	44	63
95	43	62
90	42	60
85	41	59
80	40	57
75	38	56

A Raw Score of 130 is a T of 50 based on ASD sample

A Raw Score of 80 is a T of 40 based on the ASD sample

A Raw Score of 90 is a T of 42 based on ASD sample; but a T score of 60 (1 SD above the national reference group)

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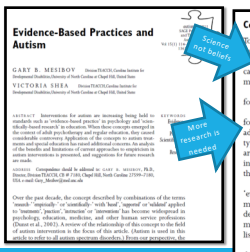
Treatment Effectiveness

Hidden dangers of using raw scores to evaluate an intervention



Evidence-Based Practices and Autism

GARY B. MESIBOV
VICTORIA SHEA

Conclusions and Recommendations

To sum up our view of the current status of empiricism and autism interventions:

There are benefits to basing decisions about interventions on empirical evidence and professional experience rather than on beliefs and testimonials.

There is a wide and frequently-changing array of terms and definitions for such an empirical approach.

The autism intervention research literature is relatively sparse compared, for example, to the research literature on interventions for depression in adults, oppositional behavior in children, reading and math curricula for typical students, etc. This paucity of research is particularly notable in the area of treatment and education for adolescents and adults: research on interventions for young children dominates the field, in spite of the fact that autism affects individuals of all ages.

Broad, flexible definitions for determining whether an intervention is 'evidence-based' (e.g., APA's) do not have specific criteria against which to measure assertions of empirical support. However, the inclusion, in the APA definition, of clinical expertise and the concept of individualizing treatment based on various client factors makes this a valuable guide for establishing the evidence base of a wide range of interventions.

Definitions of evidence-based practice that include specific criteria developed for mental health treatment or regular education (e.g., EVT/EST, SBR) are problematic when applied to the autism intervention research

Research

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Routledge
Taylor & Francis Group

Evidence-Based Comprehensive Treatments for Early Autism

- Excellent summary of research on treatments for Autism

Sally J. Rogers and Laurie A. Vismara
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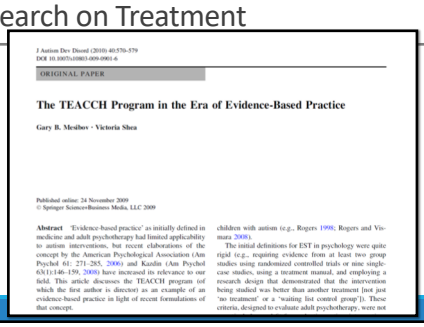
Early intervention for children with autism is currently a politically and scientifically complex topic. Randomized controlled trials have demonstrated positive effects in both short-term and longer term studies. The evidence suggests that early intervention programs are indeed beneficial for children with autism, often improving developmental functioning and decreasing maladaptive behaviors and symptom severity at the level of group analysis. Whether such changes lead to significant improvements in terms of greater independence and vocational and social functioning in adulthood is also unknown. Given the few randomized controlled treatment trials that have been carried out, the few models that have been tested, and the large differences in interventions that are being published, it is clear that the field is still very early in the process of determining (a) what kinds of interventions are most efficacious in early autism, (b) what variables moderate and mediate treatment gains and improved outcomes following intervention, and (c) the degree of both short-term and long-term improvements that can reasonably be expected. To examine these current research needs, the empirical studies of comprehensive treatments for young children with autism published since 1998 were reviewed. Lovaas's treatment meet Chambless and colleague's (Chambless et al., 1998; Chambless et al., 1996) criteria for "well-established" and no treatment meets the "probably efficacious" criteria, though three treatments meet criteria for

Research on Treatment

- TEACCH treatment meets the criterion "possibly efficacious"

stress. Language gains were particularly marked in the experimental subgroup of younger, lower functioning children. Thus, similar to Drew et al. (2002), this study demonstrated positive effects of teaching parents pragmatically based communication interventions. Although the study lacks standardized measures of developmental performance, the finding of marked increases in child spoken language in the treated group is an important outcome, given the strong predictive relationships between expressive language abilities in the preschool years and better outcomes later (Lord & Schopler, 1989; Sigman & Ruskin, 1999). Without a replication, this intervention cannot yet be considered well-established or probably efficacious. The treatment does meet the *possibly efficacious* criterion, however, because, in accordance with Chambless and Hollon (1998), there is evidence supporting the treatment's efficacy relative to a comparison control condition in one "good" study. Given that this study included randomization with well-matched comparison groups, appropriate diagnostic methods, blind assessors, and clear statistical results, this study is viewed as a Type 1 using Nathan and Gorman (2002) criteria.

Research on Treatment



J Autism Dev Disord (2010) 40:570–579
DOI 10.1007/s10803-009-0901-6

ORIGINAL PAPER

The TEACCH Program in the Era of Evidence-Based Practice

Gary B. Mesibov · Victoria Shea

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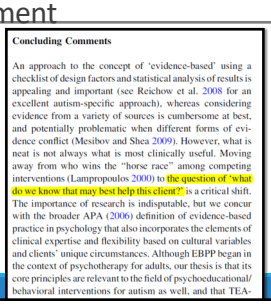
Abstract 'Evidence-based practice' as initially defined in medicine and adult psychotherapy had limited applicability to autism interventions, but recent elaborations of the concept by the American Psychological Association (Am Psychol 61: 271–285, 2006) and Kazdin (Am Psychol 63(1):146–159, 2008) have increased its relevance to our field. This article discusses the TEACCH program (of which the first author is director) as an example of an evidence-based practice in light of recent formulations of that concept.

children with autism (e.g., Rogers 1998; Rogers and Vismara 2008).

The initial definitions for EST in psychology were quite rigid (e.g., requiring evidence from at least two group studies using randomized controlled trials or nine single-case studies, using a treatment manual, and employing a research design that demonstrated that the intervention being studied was better than another treatment [not just 'no treatment' or a 'waiting list control group']). These criteria, designed to evaluate adult psychotherapy, were not

Research on Treatment

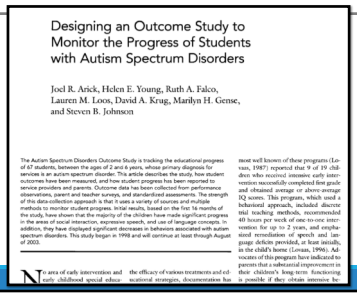
- Establishing evidence of treatment is complex
- Consider statistical and clinical benefits (e.g., impairment in life skills)



Concluding Comments

An approach to the concept of 'evidence-based' using a checklist of design factors and statistical analysis of results is appealing and important (see Reichow et al. 2008 for an excellent autism-specific approach), whereas considering evidence from a variety of sources is cumbersome at best, and potentially problematic when different forms of evidence conflict (Mesibov and Shea 2009). However, what is neat is not always what is most clinically useful. Moving away from who wins the "horse race" among competing interventions (Lampropoulos 2000) to the question of "what do we know that may best help this client?" is a critical shift. The importance of research is indisputable, but we concur with the broader APA (2006) definition of evidence-based practice in psychology that also incorporates the elements of clinical expertise and flexibility based on cultural variables and clients' unique circumstances. Although EBPP began in the context of psychotherapy for adults, our thesis is that its core principles are relevant to the field of psychoeducational/behavioral interventions for autism as well, and that TEA-

Designing an outcome study to monitor the progress of students with autism spectrum disorders. Arick, Joel R.; Young, Helen E.; Falco, Ruth A.; Loos, Lauren M.; Krug, David A.; Gense, Marilyn H.; Johnson, Steven B. Focus on Autism and Other Developmental Disabilities, Vol 18(2), Sum 2003, 75-87.



Designing an Outcome Study to Monitor the Progress of Students with Autism Spectrum Disorders

Joel R. Arick, Helen E. Young, Ruth A. Falco, Lauren M. Loos, David A. Krug, Marilyn H. Gense, and Steven B. Johnson

The Autism Spectrum Disorders Outcome Study is tracking the educational progress of 67 students, between the ages of 2 and 6 years, whose primary diagnosis for services is an autism spectrum disorder. This article describes the study, how student outcomes have been measured, and how student progress has been reported to service providers and parents. Outcome data has been collected from performance observations, parent and teacher surveys, and standardized assessments. The strength of this data-collection approach is that it uses a variety of sources and multiple methods to monitor student progress. Initial results, based on the first 16 months of the study, have shown that the majority of the children have made significant progress in the areas of social interaction, expressive speech, and use of language concepts. In addition, they have displayed significant decreases in behaviors associated with autism spectrum disorders. This study began in 1998 and will continue at least through August of 2003.

...n area of early intervention and early childhood special educa... the efficacy of various treatments and educational strategies, documentation has most well known of these programs (Lovaas, 1987) reported that 9 of 19 children who received intensive early intervention successfully completed first grade and obtained average or above-average IQ scores. This program, which used a behavioral approach, included discrete trial teaching methods, recommended 40 hours per week of one-to-one intervention for up to 2 years, and emphasized remediation of speech and language deficits provided, at least initially, in the child's home (Lovaas, 1996). Advocates of this program have indicated to parents that a substantial improvement in their children's long-term functioning is possible if they obtain intensive be-

Designing an outcome study to monitor the progress of students with autism spectrum disorders. Arick, Joel R.; Young, Helen E.; Falco, Ruth A.; Loos, Lauren M.; Krug, David A.; Gense, Marilyn H.; Johnson, Steven B. Focus on Autism and Other Developmental Disabilities, Vol 18(2), Sum 2003, 75-87.

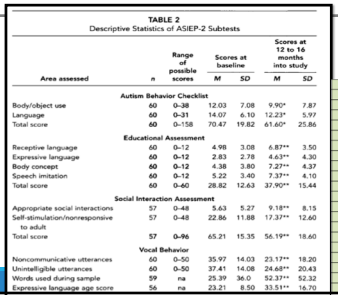


TABLE 2
Descriptive Statistics of ASIEP-2 Subtests

Area assessed	n	Range of possible scores	Scores at baseline M	Scores at baseline SD	Scores at 12 to 16 months into study M	Scores at 12 to 16 months into study SD	effect size
Autism Behavior Checklist							
Body/object use	60	0–38	12.03	7.08	9.90*	7.87	.28
Language	60	0–31	14.07	6.10	12.23*	5.97	.30
Total score	60	0–158	70.47	19.82	61.60*	25.86	.39
Educational Assessment							
Receptive language	60	0–12	4.98	3.08	6.87**	3.50	-.57
Expressive language	60	0–12	2.83	2.78	4.63**	4.30	-.50
Body concept	60	0–12	4.38	3.80	7.27**	4.37	-.71
Speech imitation	60	0–12	5.22	3.40	7.37**	4.10	-.57
Total score	60	0–60	28.82	12.63	37.90**	15.44	-.64
Social Interaction Assessment							
Appropriate social interactions	57	0–48	5.63	5.27	9.18**	8.15	-.52
Self-stimulation/nonresponsive to adult	57	0–48	22.86	11.88	17.37**	12.60	.45
Total score	57	0–96	65.21	15.35	56.19**	18.60	.53
Vocal Behavior							
Noncommunicative utterances	60	0–50	35.97	14.03	23.17**	18.20	.78
Unintelligible utterances	60	0–50	37.41	14.08	24.68**	20.43	.73
Words used during sample	59	na	25.39	36.0	52.37**	52.32	-.60
Expressive language age score	56	na	23.21	8.50	33.51**	16.70	-.78

Intervention – Kasari, et al – When Changes Over Time are Misleading

Journal of Consulting and Clinical Psychology
2006, Vol. 74, No. 1, 125–137

0022-006X/06/$12.00 DOI: 10.1037/0022-006X.74.1.125

Language Outcome in Autism: Randomized Comparison of Joint Attention and Play Interventions

Connie Kasari, Tanya Paparella, and Stephanny Freeman
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Laudan B. Jahromi
Arizona State University

This study reports results of a randomized controlled trial aimed at joint attention (JA) and symbolic play (SP) in preschool children with autism, with prediction to language outcome 12 months later. Participants were 58 children (46 boys) with autism between 3 and 4 years of age. Children were randomized to a JA intervention, an SP intervention, or control group. Interventions were conducted 30 min daily for 5–6 weeks. Assessments of JA skills, SP skills, mother–child interactions, and language development were collected at 4 time points: pre- and postintervention and 6 and 12 months postintervention by independent testers. Results indicate that expressive language gains were greater for both treatment groups compared with the control group, and results could not be explained by differences in other interventions in which children participated. For children beginning treatment with the lowest language levels, the JA intervention improved language outcome significantly more than did the SP or control interventions. These findings suggest clinically significant benefits of actively treating JA and SP skills in young children with autism.

Intervention - Kasari, et al

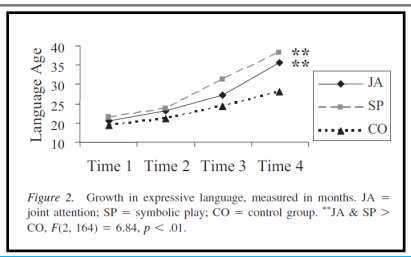
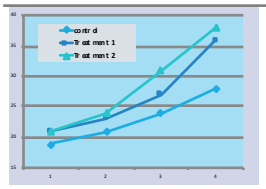
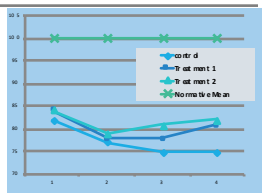


Figure 2. Growth in expressive language, measured in months. JA = joint attention; SP = symbolic play; CO = control group. **JA & SP > CO, $F(2, 164) = 6.84$, $p < .01$.

Kasari – Raw vs Standard Scores



Both treatment groups appear to have higher scores at Time 4. The interpretation of these data could lead to the conclusion that the treatments worked.



When the raw scores are converted to standard scores (Mn = 100, SD = 15) the results suggest that although the raw scores increased over the 12 month interval the standard scores associated with these raw scores actual showed no improvement.

Kasari, et al - Reinterpreted

- Even though the two treatment (as well as the control) groups' raw scores increased over time, the difference between those scores and the normative group remained large.
- Raw score improvement alone is insufficient to show treatment effectiveness.
- Standard score improvement provides an additional reference point that ***must*** be taken into consideration in order to determine if a treatment is sufficiently effective.

Treatment Evaluation with ASRS

Chapter 3
Evaluation of Treatment Effectiveness in the Field of Autism

Psychometric Considerations and an Illustration

Jack A. Naglieri and Sam Goldstein

Introduction

Evidence-based treatment and the assessment of treatment effectiveness are dependent upon the collection of data during the evaluation process providing information about symptoms, impairment and abilities. Such an assessment allows for a seamless transition from assessment and diagnosis to effective treatment. Evaluating the effectiveness of a treatment strategy or program is important for interventions designed

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Treatment Evaluation with ASRS

- Step 1: Identify specific area or areas of need based on ASRS T-scores of 60 or more
- Which indicates many characteristics similar to individuals diagnosed with an ASD.
  - Examine ASRS Total Score
- The Total Score is, however, insufficient for treatment planning because it is too general.
- Step 2: Look at the separate treatment scales

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Treatment Evaluation with ASRS

- Total Score of 73 by Parent & Teacher
- Social Communication scores are high for both raters
- Self-Regulation scores for both raters are also high

Table 3.3 Case of Donny: parent and teacher ASRS *T*-scores, differences between raters, and values needed for significance

	Parent	Teacher	Difference	Difference needed[a]	
Total score	*73*	*73*	0	5	NS
Social communication	*77*	*78*	1	6	NS
Unusual behavior	*60*	53	−7	6	Sig
Self-regulation	*70*	*74*	4	7	NS
DSM-IV scale	*69*	*68*	−1	6	NS
Treatment scales					
Peer socialization	*70*	*73*	3	9	NS
Adult socialization	58	*63*	5	12	NS
Social/emotional reciprocity	*77*	*76*	−1	8	NS
Atypical language	52	44	−8	11	NS
Stereotypy	49	54	5	13	NS
Behavioral rigidity	72	48	−24	8	Sig
Sensory sensitivity	*44*	48	4	12	NS
Attention	*71*	*73*	2	7	NS

T-scores greater than 59 appear in italic text
[a]*Note* Differences needed for significance when comparing Parent and Teacher ratings are found in Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

- Raters agree except for Unusual Behavior and Behavioral Rigidity scales.

	Parent	Teacher	Difference	Difference needed[a]	
Total score	*73*	*73*	0	5	NS
Social communication	*77*	*78*	1	6	NS
Unusual behavior	*60*	53	−7	6	Sig
Self-regulation	*70*	*74*	4	7	NS
DSM-IV scale	*69*	*68*	−1	6	NS
Treatment scales					
Peer socialization	*70*	*73*	3	9	NS
Adult socialization	58	*63*	5	12	NS
Social/emotional reciprocity	*77*	*76*	−1	8	NS
Atypical language	52	44	−8	11	NS
Stereotypy	49	54	5	13	NS
Behavioral rigidity	72	48	−24	8	Sig
Sensory sensitivity	*44*	48	4	12	NS
Attention	*71*	*73*	2	7	NS

T-scores greater than 59 appear in italic text
[a]*Note* Differences needed for significance when comparing Parent and Teacher ratings are found in Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

- The difference between Donny's Unusual Behavior scores as rated by his mother (60) and teacher (51) suggests that behaviors in the home and the classroom are different
  - exploration of the environmental impact on his odd behaviors could lead to good intervention options.
- The significant difference between Donny's Behavioral Rigidity scores as rated by his mother (72) and teacher (48), which also warrants further exploration.

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Treatment Evaluation with ASRS

- Consistently high scores on Peer Socialization, Social/Emotional Reciprocity and Attention

	Parent	Teacher	Difference	Difference needed[a]	
Total score	*73*	*73*	0	5	NS
Social communication	*77*	*78*	1	6	NS
Unusual behavior	*60*	53	−7	6	Sig
Self-regulation	*70*	*74*	4	7	NS
DSM-IV scale	*69*	*68*	−1	6	NS
Treatment scales					
Peer socialization	*70*	*73*	3	9	NS
Adult socialization	*58*	*63*	5	12	NS
Social/emotional reciprocity	*77*	*76*	−1	8	NS
Atypical language	52	44	−8	11	NS
Stereotypy	49	54	5	13	NS
Behavioral rigidity	72	48	−24	8	Sig
Sensory sensitivity	*44*	48	4	12	NS
Attention	*71*	*73*	2	7	NS

T-scores greater than 59 appear in italic text

[a]*Note* Differences needed for significance when comparing Parent and Teacher ratings are found in Table 4.5 of the ASRS Manual

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Treatment Evaluation with ASRS

- Item level analysis within Peer Socialization helps clarify the exact nature of the behaviors that led to the high score

3 Evaluation of Treatment Effectiveness in the Field of Autism 51

Fig. 3.7 Item level analysis from ASRS interpretive report (shaded items indicate scores that are more than 1 *SD* from the normative mean)

Peer Socialization	
Item	Score
3. seek the company of other children? (R)	1
14. have trouble talking with other children?	3
19. have social problems with children of the same age?	2
31. play with others? (R)	1
45. understand age-appropriate humor or jokes? (R)	1
50. talk too much about things that other children don't care about?	4
64. choose to play alone?	3
69. show good peer interactions? (R)	2
70. respond when spoken to by other children? (R)	1
Peer Socialization Raw Score =	**17**

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Treatment Evaluation with ASRS

Quick Solution Finder

Peer Socialization

Increase ability to seek out other children 51
Initiate conversation with other children 51
Increase ability to play appropriately with other children 51
Increase ability to understand humor 227
Improve ability to carry on normal conversation with peers 174
Respond appropriately when other children initiate 159

Peer Socialization	
Item	Score
14. have trouble talking with other children?	3
50. talk too much about things that other children don't care about?	4
64. choose to play alone?	3
69. show good peer interactions? (R)	2

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Treatment Evaluation with ASRS

- The Quick Solution Guide provides the correspondence of behaviors associated with ASD and specific interventions provided by authors in the chapters that appear in the book.
- For example, Donny had a high ASRS T-score on the Social/Emotional Reciprocity scale and one of the items that addressed "looking at others when spoken to" was very high. Interventions for this behavior can be found on pages

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Treatment Evaluation with ASRS

Table 3.4 Parent *T*-scores for ASRS scales obtained over three time periods

	Time 1	Time 2	Time 3	Progress monitoring (Time 2 – 1)		Progress monitoring (Time 3 – 1)	
Total score	*73*	*70*	*63*	–3	NS	10	Sig
Social communication	*77*	*77*	*66*	0	NS	11	Sig
Unusual behavior	*60*	58	58	–2	NS	2	NS
Self-regulation	*70*	*67*	62	–3	NS	8	NS
DSM-IV scale	*69*	*68*	*63*	–1	NS	6	NS
Treatment scales							
Peer socialization	*70*	*69*	*68*	–1	NS	2	NS
Adult socialization	58	58	58	0	NS	0	NS
Social/emotional reciprocity	*77*	*77*	*63*	0	NS	14	Sig
Atypical language	52	52	52	0	NS	0	NS
Stereotypy	49	49	49	0	NS	0	NS
Behavioral rigidity	72	*67*	*67*	–5	NS	5	NS
Sensory sensitivity	44	44	44	0	NS	0	NS
Attention	*71*	*68*	58	–3	NS	13	Sig

T-scores greater than 59 appear in italic text

Note Differences needed for significance when comparing scores over time for Parent and Teacher ratings are found in Table 4.11 of the ASRS Manual ($p = 0.10$ with Bonferroni correction)

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Importance of a National Norm

- Conclusions
  - The diagnostic conclusions we reach are greatly influenced by the tools we use
  - The composition of the reference group can make a substantial difference in the conclusions reached
  - Norms that represent a typical population are needed for all assessment tools
  - We have an obligation to use the highest quality tests

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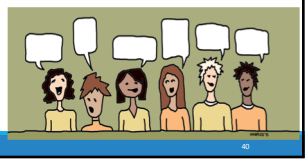
Core Group Discussion

- Organizer – Have your group discuss the information about the importance of a normative reference and norm referenced scores
- Coach – Help the group reflect on these ideas
- Recorder – Keep notes
- Energizer – Focus the group !



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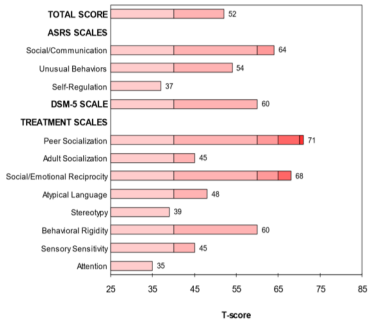
CAS-2 Norwegian Version

Subtest and Composite Scores

Subtest	Raw Score	Scaled Score PLAN	SIM	ATT	SUC
Planned Codes (PCd)	95	6			
Planned Connections (PCn)	149	11			
Planned Number Matching (PNM)	16	10			
Matrices (M)	31		11		
Verbal-Spatial Relations (VSR)	20		8		
Figure Memory (FM)	20		7		
Expressive Attention (EA)	45			6	
Number Detection (ND)	101			7	
Receptive Attention (RA)	78			10	
Word Series (WS)	9				2
Sentence Repetition/ Questions (SR/SQ)	4				3
Visual Digit Span (VDS)	16				5
		PLAN	SIM	ATT	SUC	FS
Sum of Subtest Scaled Scores		27	26	23	10	86
PASS Composite Index Scores		93	91	85	60	77
Percentile Rank		32	27	16	0.4	6



2019 Update on Sebastian

- Sebastian is now 16 years old, and started high school this year
- In the past 5 years he has seen a speech therapist regularly
  - his pronunciation has improved.
- His education has been focusing social and communication skills.
- He reads, meaningful words better than nonsense-words.
- Parents concern: that he would not be taught adequately in high school. He currently is instructed in a group with 5-6 other students, all of them with lower capacity for learning.
- We have given a detailed statement with regard to content and methods based on the official curriculum.
- What we saw the three days he came to our office, was that he was able to learn according to his PASS profile.
  - He managed well to find similarities and differences, and he learnt some basic concepts for analyzing, which he transferred to new situations. He was quickly able to understand and calculate math fractions. At the same time we saw a change in his way of appearance, from an elusive look to an open face, meeting your eyes as he got confidence in us, and in himself.

Autism Spectrum Rating Scales 2nd Edition (ASRS 2)

Adult Pilot Data analysis results

Age Range	18 mos - 5 years	6-18 Years	19-70 Years
Forms	Parent Form & Teacher Form	Parent Form & Teacher Form	Self-Report & Observer-Report
Scales	Atypical Language	Atypical Language	Atypical Language
	Adult Socialization	Adult Socialization	--
	Attention/Self Regulation	Attention	Attention
	Behavioral Rigidity	Behavioral Rigidity	Behavioral Rigidity
	Hyper-reactivity	Hyper-reactivity	Hyper-reactivity
	Hypo-reactivity*	Hypo-reactivity*	Hypo-reactivity*
	Peer Socialization	Peer Socialization	Socialization
	Social Emotional Reciprocity	Social Emotional Reciprocity	Social Emotional Reciprocity
	Self-Injurious Behavior*	Self-Injurious Behavior*	Self-Injurious Behavior*
	Stereotypy	Stereotypy	Stereotypy
	--	Anxiety*	Anxiety*
	--	Camouflaging/Masking*	Camouflaging/Masking*
	Validity*	Validity*	Validity*

Tentative ASRS-2 Scale Structure by Age Group

Data collection

- Pilot Data collection for the ASRS 2 took place in 2016-2018
- Data was collected from General population and clinical samples
- Data was collected from:
  - Individuals 19 years and older (For the Self-Report form)
  - The individual's spouse, parent or family member (For the Observe-Report Form)
- Data collection resulted in:

Form	General Population	ASD	Other Clinical
Self-Report	466	30	47
Observer-Report	452	22	26

Other Clinical Groups

- Other Clinical Groups collected included:
  - Attention Deficit Hyperactivity Disorder (ADHD)
  - Major Depressive Disorder (MDD)
  - Generalized Anxiety Disorder (GAD)
  - Bipolar Disorder
  - Obsessive Compulsive Disorder (OCD)
  - Adjustment Disorder

Scale Reliability

- Summary of the Reliability of each scale as measured by Cronbach's alpha
- Overall, the alpha values indicate high level of reliability for each scale

Scales	Self-Report		Observer-Report	
	General Population	Clinical	General Population	Clinical
Atypical Language	.88	.89	.87	.94
Attention	.86	.86	.90	.90
Behavioral Rigidity	.90	.94	.93	.91
Sensory Sensitivity	.85	.90	.84	.87
Socialization	.85	.92	.86	.90
Social/Emotional Reciprocity	.90	.93	.91	.94
Self-Injurious Behavior	.86	.79	.90	.82
Stereotypy	.87	.91	.88	.90
DSM-5 ASD	.92	.96	.93	.96

Clinical Group Differences (Cohen's d)

Large d-values are observed across nearly all comparisons, indicating the ability of the scale to identify individuals with ASD

d = 0.2-0.4 Small
d = 0.5-0.7 Medium
d >=0.8 Large

Scales	Self-Report		Observer-Report	
	ASD vs. General Population	ASD vs. Other Clinical	ASD vs. General Population	ASD vs. Other Clinical
Atypical Language	1.21	1.36	2.46	1.38
Attention	1.66	0.49	2.93	1.24
Behavioral Rigidity	1.61	1.19	2.47	1.57
Sensory Sensitivity	1.74	1.60	2.39	1.91
Socialization	1.30	0.94	2.51	1.61
Social/Emotional Reciprocity	0.86	1.23	1.80	1.53
Self-Injurious Behavior	0.88	0.62	1.76	0.70
Stereotypy	1.34	1.31	2.62	1.62
DSM-5 ASD	1.49	1.70	2.67	2.36

Topics for Today

Diagnosis

- Behavioral symptoms define the disorder based on DSM-5

Description of the Individual

- Assessment of the Behaviors related to ASD
- Determining if there is a Cognitive Processing Component
  - Cognitive profiles for those with ASD, ADHD, and SLD
- Evaluate Social Communication and Social Interactions
- Ruling out Intellectual Disability
  - A *fair and equitable* way to assess ability for students who may have Autism
- Quantifying "Significant Impairment"

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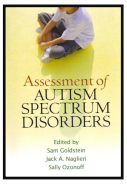
ASRS & Attention Difficulty

- Individuals with ASD have been described as having "***difficulties in disengaging and shifting attention***" (p. 214) (see Klinger, O'Kelley, & Mussey's chapter 8 in *Assessment of Autism Spectrum Disorders* (Goldstein, Naglieri, & Ozonoff, 2009)
- We tested this hypothesis using the Cognitive Assessment System (Naglieri & Das, 1997)



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ASRS & Attention Difficulty

- the ASRS (6–18 Years) and Cognitive Assessment System (CAS; Naglieri & Das, 1997) was administered to children diagnosed with an ASD who were rated by a parent (N = 45) or a teacher (N = 47)
- The CAS provides measures of
  - Planning, Attention, Simultaneous, and Successive cognitive processes

Table 8.16. Demographic Characteristics of the CAS Validity Sample

Demographic	Group	Parent N	Parent %	Teacher N	Teacher %
Gender	Male	33	73.3	34	72.3
	Female	12	26.7	13	27.7
Race/Ethnicity	Asian	4	8.9	4	8.5
	African American	6	13.3	7	14.9
	Hispanic	11	24.4	11	23.4
	White	23	51.1	24	51.1
	Multiracial/Other	1	2.2	1	2.1
Parental Education Level	Less than high school	3	6.7	–	–
	High school or equivalent	7	15.6	–	–
	Some college	16	35.6	–	–
	College or higher	19	42.2	–	–
	Total	45	100.0	47	100.0
	Age M (SD)	11.0 (3.6)		11.4 (3.4)	

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ASRS & Attention Difficulty

- Results

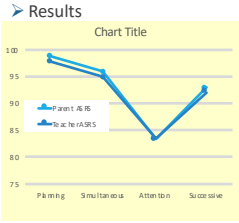

Table 8.17. ASRS and CAS Scores for Youth Diagnosed with an ASD

Rater		ASRS (6–18 Years)	Cognitive Assessment System (CAS)				
		Total Score	Full Scale	Planning	Simultaneous	Attention	Successive
Parent	*M*	65.8	89.8	98.8	95.9	83.4	93.0
	SD	9.8	25.0	27.6	17.5	17.7	20.5
	N	45	45.0	45.0	45.0	45.0	45.0
Teacher	*M*	66.5	88.8	97.8	95.0	83.5	92.1
	SD	8.6	25.0	27.5	17.8	18.1	20.3
	N	47	47	47	47	47	47

Note. ASRS *T*-scores have a normative mean of 50 and standard deviation of 10. The CAS standard scores have a normative mean of 100 and standard deviation of 15.

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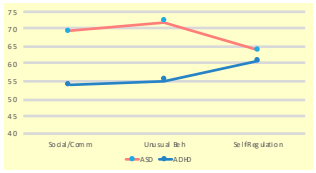
ADHD, General Population, ASD & Other Clinical

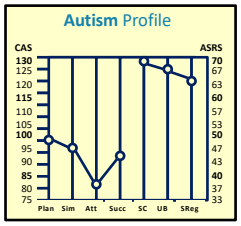
- From ASRS Manual

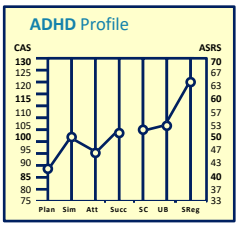
Table 8.7. Differences between ASD and other Groups: ASRS (6–18 Years) Parent Ratings

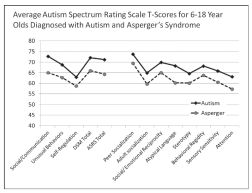
Scale			GP	ASD	ADHD	Other Clinical	d ratio: ASD vs. GP	d ratio: ASD vs. ADHD	d ratio: ASD vs. Other Clinical	Planned Comparisons
ASRS Total Score		M	48.2	69.8	57.9	60.1				ASD > GP ASD > ADHD ASD > Other Clinical
		SE	0.9	0.8	1.1	1.6	1.79	1.05	1.80	
		N	193	188	106	41				
ASRS Scales	Social Communication	M	48.1	71.1	54.0	48.7				ASD > GP ASD > ADHD ASD > Other Clinical
		SE	0.9	0.9	1.1	1.7	1.71	1.44	1.88	
		N	193	188	106	41				
	Unusual Behaviors	M	48.1	68.1	55.1	48.2				ASD > GP ASD > ADHD ASD > Other Clinical
		SE	0.9	0.9	1.1	1.6	1.60	1.13	1.72	
		N	193	188	106	41				
	Self-Regulation	M	47.2	61.4	60.9	51.4				ASD > GP ASD > ADHD ASD > Other Clinical
		SE	0.9	0.9	1.1	1.6	1.18	0.04	0.88	
		N	193	188	106	41				



Different PASS Profiles for those with ASD vs ADHD



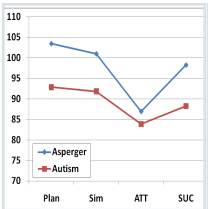





Autism and Asperger's: Two Distinct Disorders or One Disorder of Varying Symptom Severity

ASRS & CAS: Autism & Asperger's

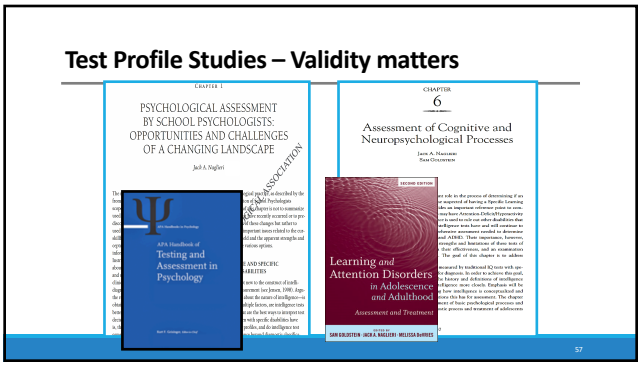
Autism vs Asperger 6-18



Descriptive Statistics and Comparisons Between Individuals with Autism (n = 20) and Asperger Syndrome (n = 23).

		Mn	*SD*	*F*	Sig	*d* -ratio
PLAN	Asperger	103.5	31.6	1.71	.20	0.40
	Autism	92.9	19.2			
SIM	Asperger	101.0	15.3	3.33	.08	0.54
	Autism	91.9	17.5			
ATT	Asperger	86.9	17.7	0.30	.59	0.17
	Autism	83.9	18.8			
SUC	Asperger	98.3	15.7	2.46	.12	0.47
	Autism	88.3	25.6			

Test Profile Studies – Validity matters



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Naglieri & Goldstein (2011)

GROUP PROFILES BY ABILITY TEST

Because ability tests play such an important role in the diagnostic process, it is crucial to understand the sensitivity each test may have to any unique characteristics of those with an SLD or attention deficit. Clinicians need to know if an adolescent or adult has a specific deficit in ability that is related to a specific academic learning problem. There has been considerable research on, for example, Wechsler subtest profile analysis, and most researchers conclude that no profile has diagnostic utility for individuals with SLD or ADHD (Kavale & Forness, 1995). The failure of subtest profiles has led some to argue (e.g., Naglieri, 1999) that scale, rather than subtest, variability should

1. We need to know if intelligence tests yield distinctive profiles

2. Subtest profile analysis is UNSUPPORTED so use scale profiles instead

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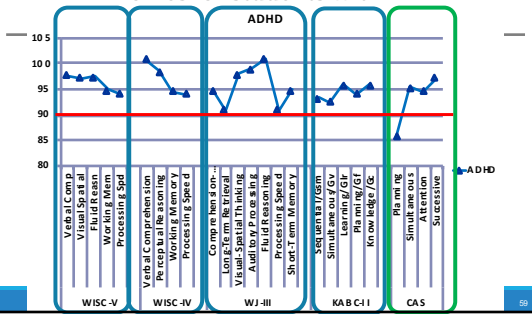
Profiles for students with ADHD



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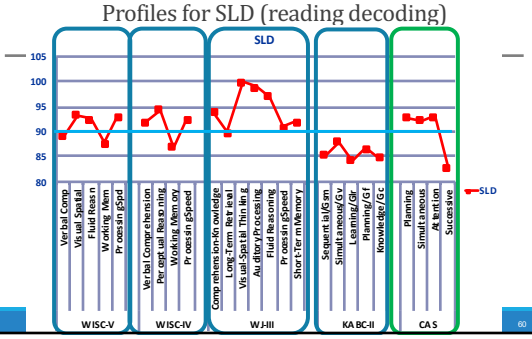
Profiles for SLD (reading decoding)



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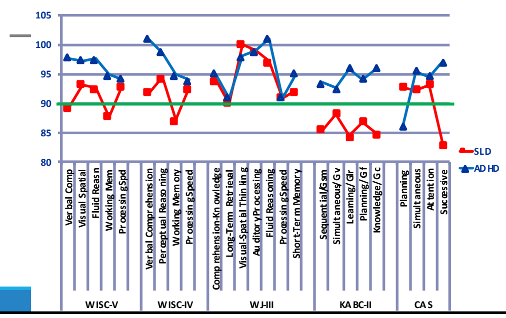
Profiles for SLD (reading decoding) & ADHD



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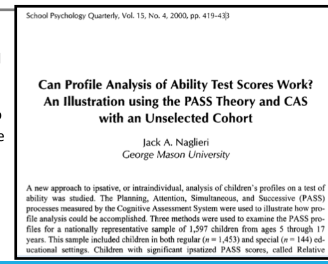
PASS Profiles and Educational Placement

Students receiving special education were more than four times as likely to have at least one PASS weakness and a comparable academic weakness than those in regular education


School Psychology Quarterly, Vol. 15, No. 4, 2000, pp. 419–433

Can Profile Analysis of Ability Test Scores Work? An Illustration using the PASS Theory and CAS with an Unselected Cohort

Jack A. Naglieri
George Mason University

A new approach to ipsative, or intraindividual, analysis of children's profiles on a test of ability was studied. The Planning, Attention, Simultaneous, and Successive (PASS) processes measured by the Cognitive Assessment System were used to illustrate how profile analysis could be accomplished. Three methods were used to examine the PASS profiles for a nationally representative sample of 1,597 children from ages 5 through 17 years. This sample included children in both regular ($n = 1,453$) and special ($n = 144$) educational settings. Children with significant ipsatized PASS scores, called Relative

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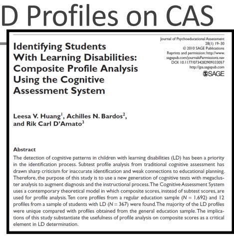
SLD Profiles on CAS


Journal of Psychoeducational Assessment
28(1) 19–30
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DOI: 10.1177/0734282909333057
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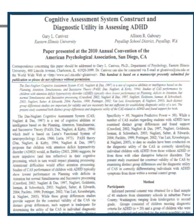
Identifying Students With Learning Disabilities: Composite Profile Analysis Using the Cognitive Assessment System

Leesa V. Huang[1], Achilles N. Bardos[2], and Rik Carl D'Amato[3]

Abstract

The detection of cognitive patterns in children with learning disabilities (LD) has been a priority in the identification process. Subtest profile analysis from traditional cognitive assessment has drawn sharp criticism for inaccurate identification and weak connections to educational planning. Therefore, the purpose of this study is to use a new generation of cognitive tests with megacluster analysis to augment diagnosis and the instructional process. The Cognitive Assessment System uses a contemporary theoretical model in which composite scores, instead of subtest scores, are used for profile analysis. Ten core profiles from a regular education sample ($N = 1,692$) and 12 profiles from a sample of students with LD ($N = 367$) were found. The majority of the LD profiles were unique compared with profiles obtained from the general education sample. The implications of this study substantiate the usefulness of profile analysis on composite scores as a critical element in LD determination.

12 profiles were found, most were unique from the general sample


Cognitive Assessment System Construct and Diagnostic Utility in Assessing ADHD

Gary L. Canivez, *Eastern Illinois University*
Allison R. Gaboury, *Puyallup School District, Puyallup, WA*

Paper presented at the 2010 Annual Convention of the American Psychological Association, San Diego, CA

the CAS correctly identified students who demonstrated behaviors consistent with ADHD diagnosis

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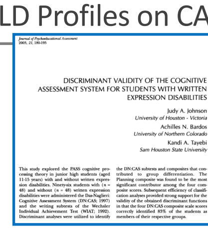
SLD Profiles on CAS

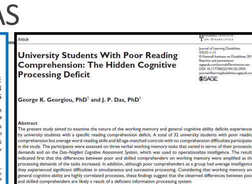

Journal of Psychoeducational Assessment
2003, *21*, 180-195

DISCRIMINANT VALIDITY OF THE COGNITIVE ASSESSMENT SYSTEM FOR STUDENTS WITH WRITTEN EXPRESSION DISABILITIES

Judy A. Johnson
University of Houston - Victoria
Achilles N. Bardos
University of Northern Colorado
Kandi A. Tayebi
Sam Houston State University

This study explored the PASS cognitive processing theory in junior high students (aged 11-15 years) with and without written expression disabilities. Ninety-six students with ($n = 48$) and without ($n = 48$) written expression disabilities were administered the Das-Naglieri: Cognitive Assessment System (DN:CAS; 1997) and the writing subtests of the Wechsler Individual Achievement Test (WIAT; 1992). Discriminant analyses were utilized to identify the DN:CAS subtests and composites that contributed to group differentiation. The Planning composite was found to be the most significant contributor among the four composite scores. Subsequent efficiency of classification analyses provided strong support for the validity of the obtained discriminant functions in that the four DN:CAS composite scale scores correctly identified 83% of the students as members of their respective groups.

CAS…yields information that [differentiates] students [with] learning disability in writing"


Article

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DOI: 10.1177/0022219413513924
journaloflearningdisabilities.sagepub.com
SAGE

University Students With Poor Reading Comprehension: The Hidden Cognitive Processing Deficit

George K. Georgiou, PhD[1] and J. P. Das, PhD[1]

Abstract

The present study aimed to examine the nature of the working memory and general cognitive ability deficits experienced by university students with a specific reading comprehension deficit. A total of 32 university students with poor reading comprehension but average word-reading skills and 60 age-matched controls with no comprehension difficulties participated in the study. The participants were assessed on three verbal working memory tasks that varied in terms of their processing demands and on the *Das–Naglieri Cognitive Assessment System*, which was used to operationalize intelligence. The results indicated first that the differences between poor and skilled comprehenders on working memory were amplified as the processing demands of the tasks increased. In addition, although poor comprehenders as a group had average intelligence, they experienced significant difficulties in simultaneous and successive processing. Considering that working memory and general cognitive ability are highly correlated processes, these findings suggest that the observed differences between poor and skilled comprehenders are likely a result of a deficient information processing system.

Despite average intelligence college students with poor reading comprehension were low on Simultaneous and Successive processing scores from the CAS

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Core Group Discussion

- Organizer – Have your group discuss ASRS and PASS score profiles for those with ASD, ADHD, and SLD
- Coach – Help the group reflect on these ideas
- Recorder – Keep notes
- Energizer – Focus the group !

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Topics for Today

Diagnosis

- Behavioral symptoms define the disorder based on DSM-5

Description of the Individual

- Assessment of the Behaviors related to ASD
- Determining if there is a Cognitive Processing Component
  - Cognitive profiles for those with ASD, ADHD, and SLD
- Evaluate Social Communication and Social Interactions
- Ruling out Intellectual Disability
  - A *fair and equitable* way to assess ability for students who may have Autism
- Quantifying "Significant Impairment"

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Back to DSM-5

- Diagnosis is based on DCM-5
- A measure of social-emotional skills could add value in treatment planning by
  - shedding light on how the disorder is influencing social interactions
  - identifying strengths at the scale and/or item level that can be leveraged in treatment to provide encouragement to parents and student.

Autism Spectrum Disorder 299.00 (F84.0)

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.
3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

Specify current severity:

Severity is based on social communication impairments and restricted, repetitive patterns of behavior (see Table 1).

How to Define SEL? www.casel.org

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Social Emotional Skills

Five key social-emotional skills from CASEL

What is Social and Emotional Learning?

The Collaborative for Academic, Social, and Emotional Learning (CASEL) describes SEL as the process of developing the following five sets of core competencies in the context of safe, caring, well-managed, academically rigorous, and engaging learning environments:

1. **Self-awareness**—being able to accurately assess one's feelings, interests, values, and strengths; maintaining a well-grounded sense of self-confidence
2. **Self-management**—being able to regulate one's emotions to handle stress, control impulses, and persevere in overcoming obstacles; setting and monitoring progress toward personal and academic goals; expressing emotions effectively
3. **Social awareness**—being able to take the perspective of and empathize with others; recognizing and appreciating individual and group similarities and differences; recognizing and using family, school, and community resources
4. **Relationship skills**—being able to establish and maintain healthy and rewarding relationships based on cooperation; resisting inappropriate social pressure, preventing, managing, and resolving interpersonal conflict; seeking help when needed
5. **Responsible decision-making**—being able to make decisions based on consideration of reason, ethical standards, safety concerns, social norms, respect for self and others, and likely consequences of various actions; applying decision-making skills to academic and social situations; contributing to the well-being of one's school and community.[1]

Autism Spectrum Disorder 299.00 (F84.0)

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):

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3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

The DESSA Comprehensive System (https://apertureed.com/dessa-overview/)

- Universal screening with an 8-item, strength-based behavior rating scale, the *DESSA-mini* f(Naglieri, LeBuffe & Shapiro) or universal screening and ongoing progress monitoring
- 72-item *DESSA* (LeBuffe, Shapiro & Naglieri) to find specific areas of need

The DESSA

- Based on resilience theory & SEL principles described by CASEL
  - Identify social-emotional strengths and needs of elementary and middle school children (for K-8th grade)
  - 72 items and 8 scales
  - Completed by parents, teachers, and/or after-school / community program staff
  - Takes 15 minutes to complete
  - On-line administration, scoring and reporting available
- Normed on 2,475 children, grades K-8 from all 50 states and is closely representative of US Population

TABLE 2.1

DESSA Standardization Sample Characteristics by Grade and Gender

	Males		Females		Total	
	n	%	*n*	%	*n*	%
Kindergarten	256	52.0	236	48.0	492	19.8
1st Grade	186	50.0	186	50.0	372	15.1
2nd Grade	161	50.0	161	50.0	322	13.1
3rd Grade	160	50.0	160	50.0	320	12.9
4th Grade	134	47.5	148	52.5	282	11.4
5th Grade	138	49.1	143	50.9	281	11.3
6th Grade	88	48.9	92	51.1	180	7.2
7th Grade	57	46.7	65	53.3	122	4.9
8th Grade	46	44.2	58	55.8	104	4.2
Total Sample	1,226	49.5	1,249	50.5	2,475	
U.S. %		51.2		48.8		

CASEL and DESSA Scales

- DESSA is closely aligned with CASEL except we expanded Responsible Decision-Making into three scales
- The scales are conceptual not factorially derived

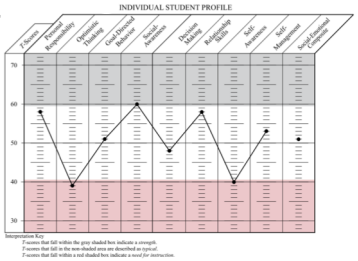
1. **Self-awareness**—being able to ac and strengths; maintaining a well
2. **Self-management**—being able to control impulses, and persevere progress toward personal and ac
3. **Social awareness**—being able to others; recognizing and appreci differences; recognizing and usin
4. **Relationship skills**—being able t relationships based on cooperati preventing, managing, and resolv needed
5. **Responsible decision-making**— consideration of reason, ethical for self and others, and likely co making skills to academic and so one's school and community.[1]

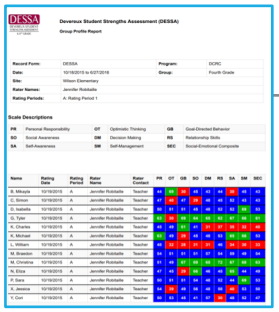
Social Emotional Composite

- Self Awareness
- Self Management
- Social Awareness
- Relationship Skills
- Decision Making
- Goal Directed Behavior
- Personal Responsibility
- Optimistic Thinking

Dessa Scales

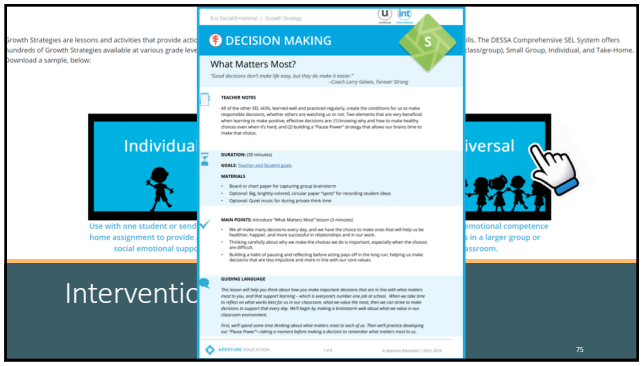
- Dessa scales are T-scores where high scores are good.
- All scales are strength based
- Scales are used to better understand the person who was rated by Parent or Teacher

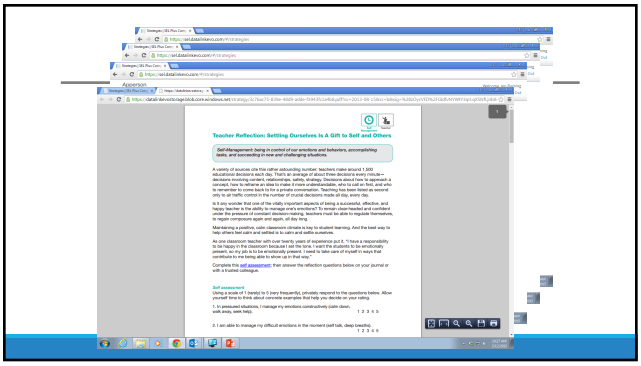




DESSA Intervention Strategies

- Provided as part of Apperson EvoSEL assessment platform
- 5 different levels of strategies for each of the eight DESSA scales
  - Teacher Reflection & Action
  - Universal
  - Group
  - Individual Student
  - Home
- 3 different age groupings: primary, intermediate elementary, and middle school





Does SEL Matter?

Skills for Social and Academic Success

Research Links SEL to Higher Success

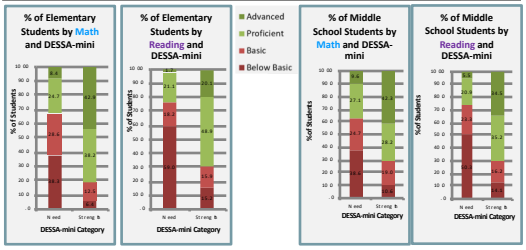
- 23% gain in SE skills
- 9% gain in attitudes about self/others/school
- 9% gain in pro-social behavior
- 11% gain on academic performance via standardized tests (math and reading)

And Reduced Risks for Failure

- 9% difference in problem behaviors
- 10% difference in emotional distress

Source: Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D., and Schellinger, K. (2011). The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. *Child Development, 82,* 405-432.

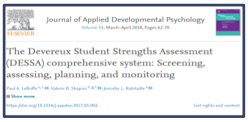
Relationship Between Academic skills and Social-Emotional Competence for **Elementary & Middle School Students**



Prediction of Challenging Behaviors

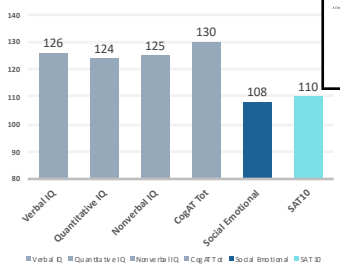
- Allentown Social Emotional Learning Initiative
  - approximately 12,000 students K-8th grade (ages 6-16)
- All students screened in October with the DESSA-Mini
  - 9,248 students; 65% Hispanic, 17% Black, 14% white, 4% other.
- Random 5 students per classroom assessed in October with DESSA
- Analysis Sample (n=1875)

Students who were identified as having a Need for SEL Instruction on the 8-item DESSA-Mini in October were 4.5 times more likely to have a record of serious infraction by the end of the academic year as compared to those with typical scores.



Kong (2013): IQ, SEL & Achievement

- Tiffany Kong studied CogAT, DESSA, and achievement scores for 276 elementary students grades K-8
- All gifted based on scores on verbal, quantitative, or nonverbal test scores at least 97th percentile



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Kong (2013) SEL Predicts Beyond IQ (p. 44)

DESSA predicted reading, language and math scores over IQ (CogAt) scores

Relations between Cognitive Ability, Socioemotional Competency, and Achievement Variables

Hierarchical regression analyses were conducted to determine which scales and subtests predicted the most variance in the dependent achievement variables. Composite CogAT scores were not found to significantly predict composite achievement, $R^2\Delta = .03$, $F(1, 121) = 3.27$, $p > .05$, reading, language, or math scores over-and-above the DESSA Total scores (Table 11). On the other hand, the DESSA Total scores significantly predicted composite achievement, $R^2\Delta = .05$, $F(1, 121) = 6.99$, $p < .05$; language scores, $R^2\Delta = .03$, $F(1, 121) = 4.26$, $p < .05$; and math scores, $R^2\Delta = .05$, $F(1, 121) = 6.09$, $p < .05$, over-and-above the composite CogAT scores.

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Core Group Activity

- **O**rganizer – Have the group discuss this question: "How do you feel about what was just presented?"
- **C**oach – guide the discussion so that the group arrives at an answer to the question
- **R**eporter – record and report to the group
- **E**nergizer – keep the discussion going !

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Topics for Today

Diagnosis

- Behavioral symptoms define the disorder based on DSM-5

Description of the Individual

- Assessment of the Behaviors related to ASD
- Determining if there is a Cognitive Processing Component
  - Cognitive profiles for those with ASD, ADHD, and SLD
- Evaluate Social Communication and Social Interactions
- Ruling out Intellectual Disability
  - A *fair and equitable* way to assess ability for students who may have Autism
- Quantifying "Significant Impairment"

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DSM-5™ Diagnostic Criteria

- When ruling out or identifying intellectual disability it is critical to consider the selection of the intelligence test
- Some IQ tests are more appropriate than others…

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

Note: Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Specify if:

With or without accompanying intellectual impairment

With or without accompanying language impairment

Associated with a known medical or genetic condition or environmental factor
(**Coding note:** Use additional code to identify the associated medical or genetic condition.)

Associated with another neurodevelopmental, mental, or behavioral disorder
(**Coding note:** Use additional code(s) to identify the associated neurodevelopmental, mental, or behavioral disorder(s).)

With catatonia (refer to the criteria for catatonia associated with another mental disorder for definition)
(**Coding note:** Use additional code 293.89 [F06.1] catatonia associated with autism spectrum disorder to indicate the presence of the comorbid catatonia.)

How to Achieve Fair Assessment of Intelligence for all Students

Leave traditional IQ behind !

Traditional IQ and Achievement Tests

- In the mid 1970's when working as a school psychologist I noticed that parts of the WISC we were administering was VERY similar to parts of the achievement tests
- HOW DOES THAT MAKE SENSE?
  - It does NOT
- WHY DO WE HAVE THIS PROBLEM?
  - Our history of IQ

- 1975 Charles Champagne Elementary, Bethpage, NY

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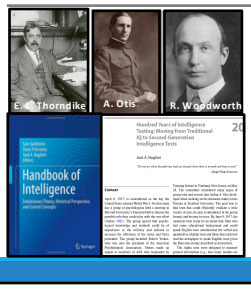
Evolution of IQ http://www.jacknaglieri.com/cas2.html



- A group of psychologists met at Harvard in April of 1917 to construct an ability test to help the US military evaluate recruits (WWI) for responsible positions
- Their goal was to develop a workable set of tests

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Alpha Beta 1917

Origins of the WISC –
A Star is Born !

On July 20, 1917 they concluded that the Army Alpha and Beta tests could …

- "aid in segregating and eliminating the mentally incompetent, classify men according to their mental ability; and assist in selecting competent men for responsible positions" (p. 19, Yerkes, 1921).

Thus, **July 20, 1917** is the birth date of the verbal, quantitative, nonverbal IQ test format -- **Traditional groups and individually administered IQ tests.**

- **We have had more than 100 years of this approach to intelligence testing**

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From Alpha/Beta to Wechsler IQ

Yoakum & Yerkes (1920) Summarized The Methods Used By The Military

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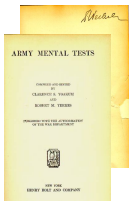
From Alpha/Beta to Wechsler IQ



- Army Alpha
  - Synonym- Antonym
  - Disarranged Sentences
  - Number Series
  - Arithmetic Problems
  - Analogies
  - Information

Verbal & Quantitative questions demand knowledge

- Army Beta
  - Maze
  - Cube Imitation
  - Cube Construction
  - Digit Symbol
  - Pictorial Completion
  - Geometrical Construction

Nonverbal typically demand much less knowledge

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The First IQ TEST: Alpha (Verbal)

tobacco	1. Bull Durham is the name of
fruit	2. The Mackintosh Red is a kind of
typewriter	3. The Oliver is a
Mogul	4. A passenger locomotive type is the
engineers	5. Stone & Webster are well know
Superbas	6. The Brooklyn Nationals are called
fabric	7. Pongee is a
corn	8. Country Gentleman is a kind of
Mckinley	9. The President during the Spanish War was
cigarette	10. Fatima is a make of

From: Psychological Examining the United States Army (Yerkes, 1921, p. 213)

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1920 Army Testing (Yoakum & Yerkes)

Note there is no mention of measuring verbal and nonverbal intelligences – **it was a social justice issue.**

Why Beta?

METHODS AND RESULTS 19

Men who fail in alpha are sent to beta in order that injustice by reason of relative unfamiliarity with English may be avoided. Men who fail in beta are referred for individual examination by means of what may appear to be the most suitable and altogether appropriate procedure among the varied methods available. This reference for careful individual examination is yet another attempt to avoid injustice either by reason of linguistic handicap or accidents incident to group examining.

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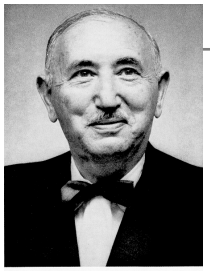

David Wechsler, Ph.D.

Wechsler (1939)

- His definition of intelligence does not mention verbal or nonverbal *abilities*:

  "The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment (1939)"

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Wechsler & Spearman's *g*

of nonverbal assessment many paces forward. In addition, the emphasis in the *WNV Manual* that the Full Scale measures *general ability nonverbally*—and *not* nonverbal ability—is an important distinction that further ties the WNV to Dr. Wechsler. Although his intelligence tests in the 1930s and 1940s departed from the one-score *Stanford-Binet* by offering separate Verbal and Performance IQs as well as a profile of scaled scores, Dr. Wechsler remained a firm believer in Spearman's *g* theory throughout his lifetime. He believed that his Verbal and Performance Scales represented different ways to access *g*, but he never believed in nonverbal intelligence as being separate from *g*. Rather, he saw the Performance Scale as the most sensible way to measure the general intelligence of people with hearing impairments, language disorders, or limited proficiency in English. And that is precisely what the WNV is intended to do.

Alan S. Kaufman, PhD
Clinical Professor of Psychology
Yale Child Study Center
Yale University School of Medicine

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Thinking vs Knowing

- IQ tests that are confounded by knowledge
  - WISC-V
    - Verbal Comprehension: Vocabulary, Similarities, Information & Comprehension
    - Fluid Reasoning: Figure Weights, Picture Concepts, Arithmetic
  - WJ-IV and Batería-IV
    - Comprehension Knowledge: Vocabulary & General Information
    - Fluid Reasoning: Number Series & Concept Formation
    - Auditory Processing: Phonological Processing
  - K-ABC-II
    - Knowledge / GC: Riddles, Expressive Vocabulary, Verbal Knowledge

THIS is a BIG problem for individuals with Intellectual Disability !

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Thinking and Knowing Continuum

Cognitive Assessment System–2 Wechsler Nonverbal Scale of Ability	Kaufman Assessment Battery for Children-2	Wechsler Intelligence Scale for Children-5	Woodcock-Johnson Cognitive-4	Feifer Assessment of Reading & Math	Stanford Achievement Test Kaufman Test Educational Achievement-3

- The obvious connection between educational opportunity and vocabulary and arithmetic subtests was noted by Matarazzo (1972) when he wrote: "a man's vocabulary is necessarily influence by his education and cultural opportunities (p. 218)" and when referring to the Arithmetic subtest, "its merits are lessened by the fact that it is influenced by education (p. 203)".
  The impact of education on intelligence tests was clearly understood yet our interpretations of these scores have not adequately recognized the threat to validity.

Myth of Verbal IQ - Conclusions

- The lack of a clear distinction between ability and achievement tests has corrupted the very concept of "verbal ability"
- A person who has not had an opportunity to learn because of poverty, language difference, SLD or intellectual disability will be at disadvantage when assessed with so-called Verbal and Quantitative reasoning "ability" tests
- SOLUTION ? **Re**invent intelligence

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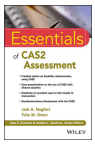
We Do NOT Need Verbal Tests

Do we really need IQ test content that requires knowledge of words and arithmetic?



Correlations Between Ability and Achievement Test Scores			Average Correlation: All Scales	Average Correlation: Scales without achievement
WISC-V	Verbal Comprehension	.74	.53	.47
WIAT-III	Visual Spatial	.46		
N = 201	Fluid Reasoning	.40		
	Working Memory	.63		
	Processing Speed	.34		
WJ-IV COG	Comprehension Knowledge	.50	.54	.50
WJ-IV ACH	Fluid Reasoning	.71		
N = 825	Auditory Processing	.52		
	Short Term Working Memory	.55		
	Cognitive Processing Speed	.55		
	Long-Term Retrieval	.43		
	Visual Processing	.45		
KABC	Sequential/Gsm	.43	.53	.48
WJ-III ACH	Simultaneous/Gv	.41		
N = 167	Learning/Glr	.50		
	Planning/Gf	.59		
	Knowledge/GC	.70		
CAS	Planning	.57	.59	
WJ-III ACH	Simultaneous	.67		
N=1,600	Attention	.50		
	Successive	.60		

Note: WJ-IV Scales Comp-Known Vocabulary and General Information; Fluid Reasoning Number Series and Concept Formation; Auditory Processing = Phonological processing.

Note: All correlations are reported in the ability tests' manuals. Values were averaged within each ability test using Fisher z transformations.

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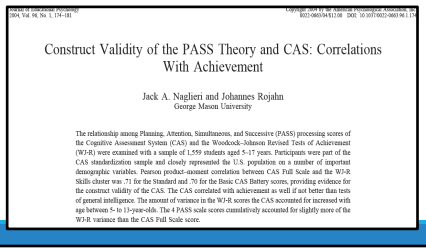
Prediction of Achievement

- Correlation of PASS with achievement = **.71**



Construct Validity of the PASS Theory and CAS: Correlations With Achievement

Jack A. Naglieri and Johannes Rojahn
George Mason University

The relationship among Planning, Attention, Simultaneous, and Successive (PASS) processing scores of the Cognitive Assessment System (CAS) and the Woodcock–Johnson Revised Tests of Achievement (WJ-R) were examined with a sample of 1,559 students aged 5–17 years. Participants were part of the CAS standardization sample and closely represented the U.S. population on a number of important demographic variables. Pearson product–moment correlation between CAS Full Scale and the WJ-R Skills cluster was .71 for the Standard and .70 for the Basic CAS Battery scores, providing evidence for the construct validity of the CAS. The CAS correlated with achievement as well if not better than tests of general intelligence. The amount of variance in the WJ-R scores the CAS accounted for increased with age between 5- to 13-year-olds. The 4 PASS scale scores cumulatively accounted for slightly more of the WJ-R variance than the CAS Full Scale score.

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A Shift from Traditional To Second Generation Intelligence Tests

Wechsler, et al

↓

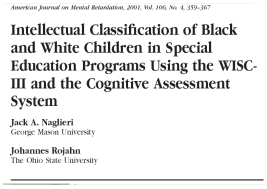
Kaufman **A**ssessment **B**attery for **C**hildren

↓

Cognitive **A**ssessment **S**ystem

Wechsler vs CAS for Students with ID

- ***White*** children earned the same mean scores on WISC-III and CAS
- ***Black*** children earned lower VIQ than PIQ scores due to language / achievement tasks → low Full Scale
- ***Black*** children earned ***higher*** scores on CAS than whites
- ***Fewer*** Black children would be identified as having intellectual disability based on Full Scale scores using CAS than WISC-III
- *THIS IS A SOCIAL JUSTICE ISSUE.*



American Journal on Mental Retardation, 2001, Vol. 106, No. 4, 359–367

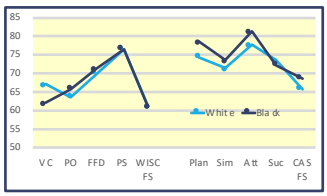
Intellectual Classification of Black and White Children in Special Education Programs Using the WISC-III and the Cognitive Assessment System

Jack A. Naglieri
George Mason University

Johannes Rojahn
The Ohio State University

More Details on the Study

- "The Black students earned significantly lower WISC-III verbal scores than performance scores, t(45) 5 3.2, p , .01, …
- there was no significant difference between those scores among Whites.
- This suggests that the Verbal IQ scale (and Verbal Comprehension Index) of the WISC-III, which contains achievement-like tests such as Vocabulary, Arithmetic, and Information, posed particular difficulty for these Black children. (p. 363)"



"The WISC-III classified 36% more Black children as having mental retardation than did the CAS" (p. 364)

CASE STUDY: ALEJANDRO (C.A. 7-0 GRADE 1)

REASON FOR REFERRAL: Does he have Intellectual Disability?

- Academic:
  - Could not identify letters/sounds
  - October. Could only count to 39
  - All ACCESS scores of 1
- Behavior:
  - Difficulty following directions
  - Attention concerns
  - Refusal/defiance

Note: this is not a picture of Alejandro

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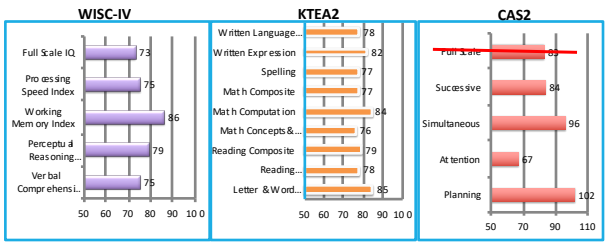
Does Alejandro appear to have ID?



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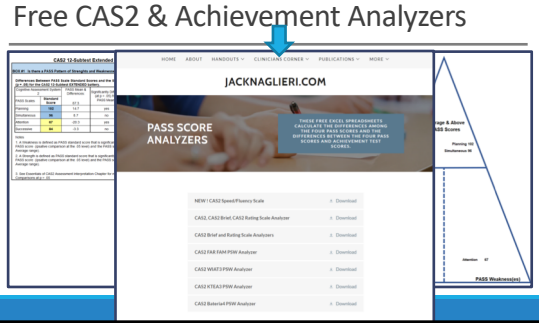
Free CAS2 & Achievement Analyzers



Alejandro and PASS (by Dr. Otero)

- Alejandro is not a slow learner.
- He has good scores in basic psychological processes:
  - Simultaneous = 96 and Planning = 102
- He has a "disorder in one or more of the basic psychological processes"
  - Attention = 67 and Successive = 84
- And he has academic failure which equals an SLD determination.

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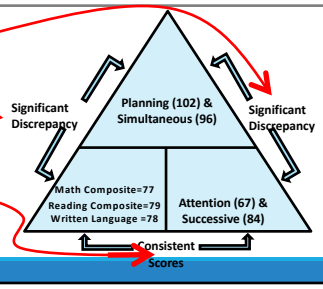
Discrepancy Consistency Method for SLD

- Discrepancy between high and low processing scores
- Discrepancy between high processing and low achievement
- Consistency between low processing and low achievement



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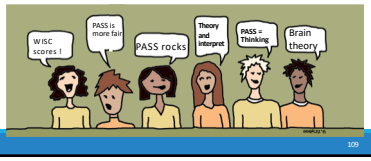
Core Group Activity

- **O**rganizer – Have the group discuss this question: "Your reaction to the different views of Alejandro the different tests yield?"
- **C**oach – guide the discussion
- **R**eporter – will record and report to the group
- **E**nergizer – keep the discussion going !



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Measuring Brain Function is the Key

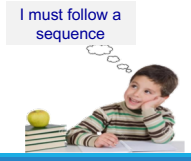
A Closer Look at How PASS Theory is Measured

Intelligence Tests Should Measure Thinking not Knowing

- What does the student have to ***know*** to complete a task?
  - ***This is dependent on educational opportunity (e.g., Vocabulary, Arithmetic, phonological skills, etc.)***

How does the student have to ***think*** to complete a task?

This is dependent on the brain's neurocognitive processes



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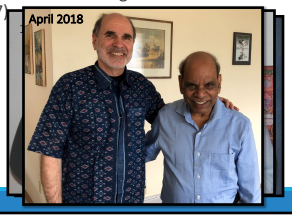
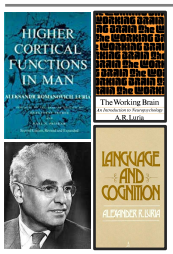
Intelligence as Neurocognitive Functions

- In Das and Naglieri's first meeting (February 11, 1984) they proposed that intelligence was better REinvented as neurocognitive processes and began development of the **C**ognitive **A**ssessment **S**ystem (Naglieri & Das, 1997)
- They conceptualized intelligence as Planning, Attention, Simultaneous, and Successive (PASS) neurocognitive processes.



PASS Neurocognitive Theory



- **P**lanning = THINKING ABOUT HOW YOU DO WHAT YOU DECIDE TO DO
- **A**ttention = BEING ALERT AND RESISTING DISTRACTIONS
- **S**imultaneous = GETTING THE BIG PICTURE
- **S**uccessive = FOLLOWING A SEQUENCE

PASS = 'basic psychological processes'

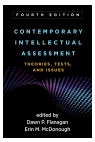
Neuropsychological Correlates of PASS

Naglieri, J. A., & Otero, T. M. (2018). Redefining Intelligence as the PASS Theory of Neurocognitive Processes. In Flanagan, D. P., & Harrison, P. L. (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (4th ed.). New York, NY: Guilford Press.


CHAPTER 6

Redefining Intelligence with the Planning, Attention, Simultaneous, and Successive Theory of Neurocognitive Processes

Jack A. Naglieri
Tulio M. Otero



PASS Comprehensive System

(Naglieri, Das, & Goldstein, 2014)

CAS2 Core & Extended English & Spanish for comprehensive Assessment
CAS2 Brief for re-evaluations, instructional planning, screening for gifted
CAS2 Rating Scale for teacher ratings

CAS2 Rating Scale (4 subtests)	CAS2 Brief (4 subtests)	CAS2 Core (8 subtests)	CAS2 Extended (12 subtests)
Total Score	Total Score	Full Scale	Full Scale
Planning	Planning	Planning	Planning
Simultaneous	Simultaneous	Simultaneous	Simultaneous
Attention	Attention	Attention	Attention
Successive	Successive	Successive	Successive
			Supplemental Scales
			Executive Function
			Working Memory
			Verbal / Nonverbal
			Visual / Auditory
			Speed / Fluency

PASS Theory: Planning

- Planning is a term used to describe a neurocognitive function similar to metacognition and executive function
- Planning is needed for setting goals, making decisions, predicting the outcome of one's own and others actions, impulse control, strategy use and retrieval of knowledge
- Planning helps us make decisions about how to solve any kind of a problem from academics to social situations and life in general

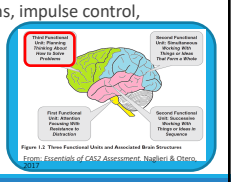
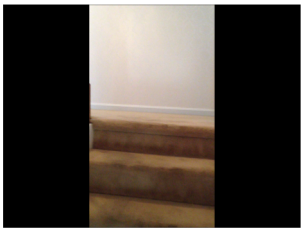


Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*, Naglieri & Otero, 2017

A 13 month old's Plan

At 19 months Planning & Knowledge



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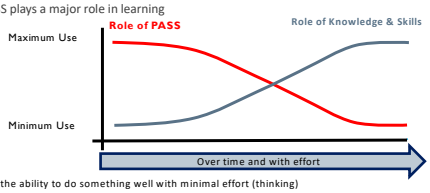
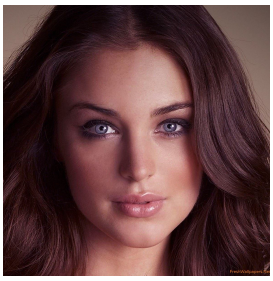
Planning Learning Curves

- Learning depends upon many factors especially PASS
- When a task is practiced and learned it requires less thinking (PASS) and becomes a skill
- At first, PASS plays a major role in learning



Note: A **skill** is the ability to do something well with minimal effort (thinking)



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PASS Theory

- Attention is a basic psychological process we use to
  - selectively attend to some stimuli and ignores others
  - Focus our cognitive activity
  - Selective attention
  - Resistance to distraction
  - Listening, as opposed to hearing

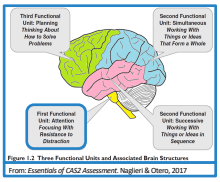

Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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Expressive Attention on CAS2

RED	BLUE	GREEN	YELLOW
YELLOW	GREEN	RED	BLUE
RED	YELLOW	YELLOW	GREEN
BLUE	GREEN	RED	BLUE
GREEN	YELLOW	RED	YELLOW

- An attention test MUST have multi-dimensional stimuli
- The stimulus you have to ignore should be stronger than the one you have to attend to
- The task gets harder over time

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Attention

Selecting the correct answer is difficult because of the similarity of the options which places considerable demands on Attention

11. A 3:15 A.M. B 3:30 P.M. C 3:15 P.M. D 3:15 A.M.

leave school

12. Trent began studying at 5:00 P.M. and finished 1 hour and 22 minutes later. What time did he finish?
A 6:22 A.M. B 5:22 P.M. C 6:10 P.M. D 6:22 P.M.

13. Maura began basketball practice at 3:00 P.M. and finished 50 minutes later. What time did she finish?
A 3:50 P.M. B 3:05 A.M. C 4:05 P.M. D 4:50 A.M.

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Modern Theory: Successive

- **Successive** processing is a basic psychological process we use to manage stimuli in a specific serial order
  - Stimuli form a chain-like progression
  - Word Series
  - Sentence Questions

- **Academic tasks**
  - Decoding words
  - Letter-sound correspondence
  - Phonological tasks
  - Understanding the syntax of sentences
  - Sequence of words, sentences, paragraphs
  - Remembering the sequence of events
  - Learning motor movements

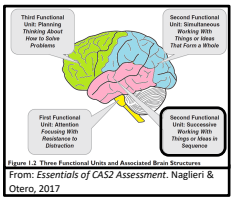

Figure 1.2 Three Functional Units and Associated Brain Structures

From: *Essentials of CAS2 Assessment*. Naglieri & Otero, 2017

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Successive Processing Tests

Visual Digit Span

4 3 8 6 1

Word Series

Cow → Wall → Car → Girl

- **Sentence Repetition (Ages 5-7)**
  - Child repeats sentences exactly as stated by the examiner such as:
  - ***The red greened the blue with a yellow.***

- **Sentence Questions (Ages 8 – 18)**
  - Child answers a question about a statement made by the examiner such as the following:
  - ***The red greened the blue with a yellow. Who got greened?***

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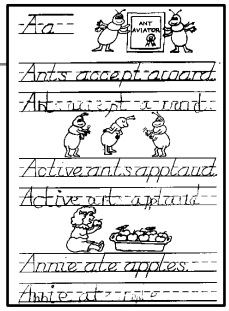
Successive Processing

The sequence of the sounds is emphasized in this work sheet



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Successive Processing is the foundation of Phonemic Skills

"Now I am going to say parts of words. I want you to put the parts together to make a whole word."

Blending: Advantage

Item	Correct response	# of syllables	Score
ad : van : tage	advantage	3	0 1

From the Feifer Assessment of Reading (2016)

- The ability to sequence and sequence multiple sounds together to identify a word in print is critical for reading decoding

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Consider this…

- Even though the tasks were different in content (numbers and words) and modality (auditory and visual), they required the same kind of thinking – Successive processing

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PASS Theory

- **Simultaneous** processing is used to integrate stimuli into groups
  - Each piece must be related to the other
  - Stimuli are seen as a whole
- Academics:
  - Reading comprehension
  - geometry
  - math word problems
  - whole language
  - verbal concepts

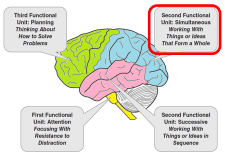

Figure 1.2 Three Functional Units and Associated Brain Structures
From: *Essentials of CAS2 Assessment.* Naglieri & Otero, 2017

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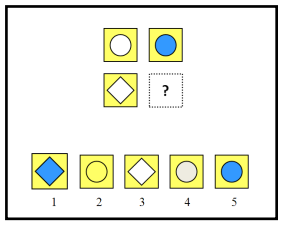

3 is to 6 as 5 is to ___?

Girl is to woman as boy is to _____?

C^7 is to F as E^7 is to _____?

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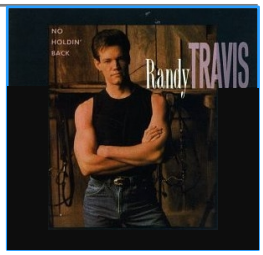
Simultaneous Verbal Task

- Simultaneous processing using verbal content
- Who is this song about?

My momma's daddy was his oldest son.



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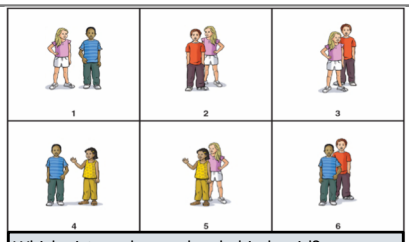
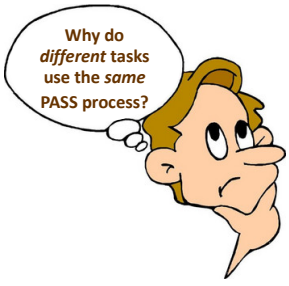
CAS2 Verbal-Spatial Relations



Which picture shows a boy behind a girl?



And Consider this…

- Even though the tasks were different in content (shapes, words, numbers & musical notations) and modality (auditory and visual), they required **Simultaneous** processing!

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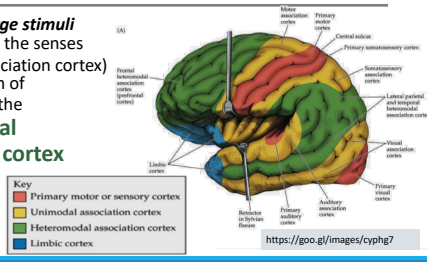
Heteromodal Association Cortex (Goldberg, 2006)

- Our brains ***merge stimuli*** coming in from the senses (unimodal association cortex) into one stream of information in the **Heteromodal association cortex** (green areas)

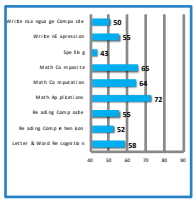


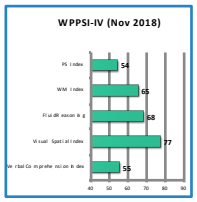
https://goo.gl/images/cyphg7

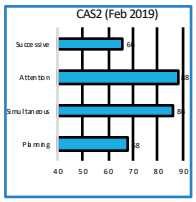
Alexandra: Age 8-1; 2nd Grade
Re-evaluation: Concern is student ID?

- Very Low in Math, Reading and Spelling.
- Difficulty remembering information, keeping information in order, limited use of strategies.
- Spend 40% of her day in a cluster classroom with kindergarteners and 1st graders.
- Has received Sp/L services for two years. History of selective mutism
- Currently receives services under Developmental Delay.
- Spanish dominant. Low vocabulary in both English and Spanish

Alexandra **Batería-IV, WPPSI-IV, CAS2**

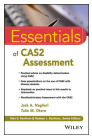






Discrepancy Consistency Method (DCM)

- The Discrepancy Consistency Method (DCM) was first introduced in 1999 (most recently in 2017) as a way to operationalize the definition of a Specific Learning Disability (SLD) following from IDEA



- SLD is "a disorder in 1 or more of the basic psychological processes … which manifests itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations."
- The disorder in 1 or more basic psychological processes is found when a student shows a pattern of strengths and weaknesses in basic psychological processes, **and**…
- There is an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations The result is two discrepancies and a consistency

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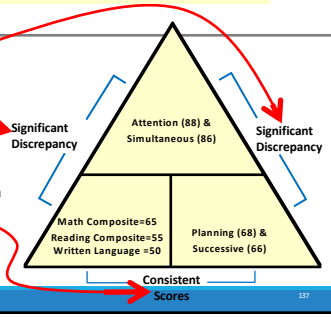
Discrepancy Consistency Method for Maria

- **Discrepancy #1** between high and low processing scores
- **Discrepancy #2** between high processing and low achievement
- **Consistency** between low processing and low achievement



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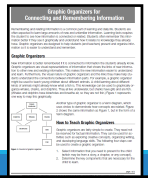
Interventions related to PASS

- *Helping Children Learn Intervention Handouts for Use in School and at Home*, *Second Edition (*Naglieri, & Pickering 2011)
- Graphic Organizer or Word Families use strength in Simultaneous
- Segmenting to make Successive tasks more manageable



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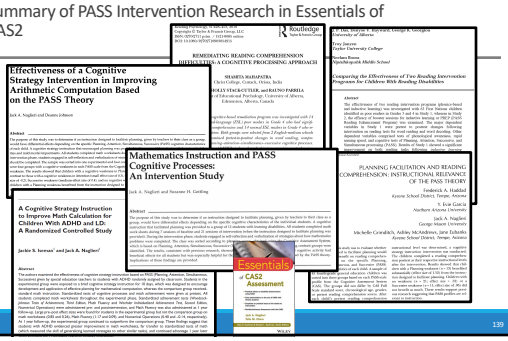
Summary of PASS Intervention Research in Essentials of CAS2



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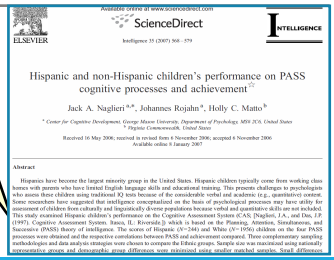
Naglieri, Rojahn, Matto (2007)

Hispanic White difference on CAS Full Scale of 4.8 standard score points (matched)



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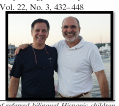
PASS scores – English and Spanish

Bilingual Hispanic Children's Performance on the English and Spanish Versions of the Cognitive Assessment System

School Psychology Quarterly
2007, Vol. 22, No. 3, 432–448

Jack A. Naglieri
George Mason University
Tulio Otero
Columbia College, Elgin Campus
Brianna DeLauder
George Mason University
Holly Matto
Virginia Commonwealth University



This study compared the performance of referred bilingual Hispanic children on the Planning, Attention, Simultaneous, Successive (PASS) theory as measured by English and Spanish versions of the Cognitive Assessment System (CAS; Naglieri & Das, 1997a). The results suggest that students scored similarly on both English and Spanish versions of the CAS. Within each version of the CAS, the bilingual children earned their lowest scores in Successive processing regardless of the language used during test administration. Small mean differences were noted between the means of the English and Spanish versions for the Simultaneous and Successive processing scales; however, mean Full Scale scores were similar. Specific subtests within the Simultaneous and Successive scales were found to contribute to the differences between the English and Spanish versions of the CAS. Comparisons of the children's profiles of cognitive weakness on both versions of the CAS showed that these children performed consistently despite the language difference.

Keywords: bilingual assessment, intelligence, PASS Theory, Cognitive Assessment System, non-biased assessment

Means, *SDs*, *d*-ratios, Obtained and Correction Correlations Between the English a

Spanish Version of the CAS (*N* = 55).

	CAS English		CAS Spanish		*d*-ratio	Correlations	
	Mean	*SD*	Mean	*SD*	*d*	Obtained	Corrected
Planning	92.6	13.1	92.6	13.4	.00	.96	.97
Simultaneous	89.0	12.8	93.0	13.7	-.30	.90	.93
Attention	94.8	13.9	95.1	13.9	-.02	.98	.98
Successive	78.0	13.1	83.1	12.6	-.40	.82	.89
Full Scale	84.6	13.6	87.6	13.8	-.22	.96	.97

- Very similar scores in both versions
- >90% agreement between PASS weakness & strengths using English and Spanish CAS

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Otero, Gonzales, Naglieri (2013)

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The Neurocognitive Assessment of Hispanic English-Language Learners With Reading Failure

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This study examined the performance of referred Hispanic English-language learners ($N = 40$) on the English and Spanish versions of the *Cognitive Assessment System* (CAS; Naglieri & Das, 1997). The CAS measures basic neuropsychological processes based on the Planning, Attention, Simultaneous, and Successive (PASS) theory (Naglieri & Das, 1997; Naglieri & Otero, 2011c). Full Scale (FS) scores as well as PASS processing scale scores were compared, and no significant differences were found in FS scores or in any of the PASS processes. The CAS FS scores on the English ($M = 86.4$, $SD = 8.73$) and Spanish ($M = 87.1$, $SD = 7.94$) versions correlated .94 (uncorrected) and .99 (corrected for range restriction). Students earned their lowest scores in Successive processing regardless of the language in which the test was administered. PASS cognitive profiles were similar on English and Spanish versions of the PASS scales. These findings suggest that students scored similarly on both versions of the CAS and that the CAS may be a useful measure of these four abilities for Hispanic children with underdeveloped English-language proficiency.

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CAS in Italy

Using US norms, Italian sample (N = 809) CAS Full Scale was 100.9 and matched US sample (N = 1,174) was 100.5 and factorial invariance was found

Psychological Assessment

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Multigroup Confirmatory Factor Analysis of U.S. and Italian Children's Performance on the PASS Theory of Intelligence as Measured by the Cognitive Assessment System

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This study examined Italian and U.S. children's performance on the English and Italian versions, respectively, of the Cognitive Assessment System (CAS; Naglieri & Conway, 2009; Naglieri & Das, 1997), a test based on a neurocognitive theory of intelligence entitled PASS (Planning, Attention, Simultaneous, and Successive; Naglieri & Das, 1997; Naglieri & Otero, 2011). CAS subtest, PASS scales, and Full Scale scores for Italian ($N = 809$) and U.S. ($N = 1,174$) samples, matched by age and gender, were examined. Multigroup confirmatory factor analysis results supported the configural invariance of the CAS factor structure between Italians and Americans for the 5- to 7-year-old (root-mean-square error of approximation [RMSEA] = .038; 90% confidence interval [CI] = .033, .043; comparative fit index [CFI] = .96) and 8- to 18-year-old (RMSEA = .036; 90% CI = .028, .043; CFI = .97) age groups. The Full Scale standard scores (using the U.S. norms) for the Italian (100.9) and U.S. (100.5) samples were nearly identical. The scores between the samples for the PASS scales were very similar, except for the Attention Scale ($d = 0.26$), where the Italian sample's mean score was slightly higher. Negligible mean differences were found for 9 of the 13 subtest scores, 3 showed small *d*-ratios (2 in favor of the Italian sample), and 1 was large (in favor of the U.S. sample), but some differences in subtest variances were found. These findings suggest that the PASS theory, as measured by CAS, yields similar mean scores and showed factorial invariance for these samples of Italian and American children, who differ on cultural and linguistic characteristics.

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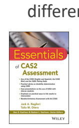
Race & IQ

- Neurocognitive tests yield smaller differences
- CAS and CAS2 have the smallest differences



Mean Score Differences in Total scores by Race by Intelligence Test.

Traditional IQ tests	
SB-IV (matched samples)	12.6
WISC-V (normative sample)	11.6
WISC–IV (normative sample)	11.5
WJ- III (normative sample)	10.9
WISC–IV (matched samples)	10.0
WISC-V (statistical controls normative sample)	8.7
RIAS-2 (normative sample)	8.0
Second Generation Intelligence Tests	
K-ABC (normative sample)	7.0
K-ABC (matched samples)	6.1
KABC-2 (matched samples)	5.0
CAS-2 (normative sample)	6.3
CAS (statistical controls normative sample)	4.8
CAS-2 (statistical controls normative sample)	4.3

Note: The data for these results are reported for the Stanford-Binet IV from Wasserman (2000); Woodcock-Johnson III from Edwards & Oakland (2006); Kaufman Assessment Battery for Children from Naglieri (1986); Kaufman Assessment Battery for Children-II from (Lichenberger, Sotelo-Dynega & Kaufman, 2009); CAS from Naglieri, Rojahn, Matto & Aquilino (2005); CAS-2 from Naglieri, Das & Goldstein, 2014; Wechsler Intelligence Scale for Children – IV (WISC-IV) from O'Donnell (2009), WISC-V from Kaufman, Raiford & Coalson (2016), Reynolds Intellectual Assessment Scale-2 Reynolds, C. R., & Kamphaus, R. W. (2015)

How Psychometric Bias is Studied (e.g., Jensen's Bias in Mental Tests)

- reliability of internal consistency of items
- reliability of test/retest scores
- rank order of item difficulties
- item intercorrelations
- factor structure of test
- magnitude of the factor loadings

- slope & intercept of the regression line
- correlation of raw scores with age
- item characteristic curve
- frequencies of choice of error distracters
- interaction of test items by group membership

Differences in Mean Scores = Impact

- According to the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 2014), **equitable assessment** provides examinees *an equal opportunity to display one's ability* and … a fair chance to achieve the same level as others with equal ability on a construct being measured.
- The Standards also remind us that if a person has had limited opportunities to learn the content in a test of intelligence, *that test may be considered unfair* if it penalizes students for not knowing the answers **even if the norming data do not demonstrate test bias.**

Test Validity and Social Justice

Validity is an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy … *of interpretations* … based on test scores (Messick, 1989).

Validity is not a property of the test or assessment as such, but rather of the *meaning* of the test scores.

A study of "Consequential validity" evaluates the value of the implications of score interpretations as well as the actual and potential consequences of test use; especially in regard to sources of invalidity related to issues of bias, fairness, and distributive justice (Messick, 1980, 1989)."

Illinois School District U-46

Main question: Does the District's gifted program unlawfully discriminate against Hispanic Students?

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

DANIEL, DINAH and DEANNA MCFADDEN, minors, by their parent and next friend, Tracy McFadden; KAREN, RODOLFO and KIARA TAPIA, minors, by their parent and next friend, Mariela Montoya; JOCELYN BURCIAGA, minor, by her parent and next friend, Griselda Burciaga; and KASHMIR IVY, minors, by their parent and next friend. Beverly Ivy; KRISTIANNE SIFUENTES, minors, by her parent and next friend. Irma Sifuentes,

Plaintiffs,

v.

BOARD OF EDUCATION FOR ILLINOIS SCHOOL DISTRICT U-46,

Defendant.

No. 05 C 0760

Judge Robert W. Gettleman

On July 11, 2013, Judge Robert Gettlemen issued a decision holding that District U-46 *intentionally* discriminated against Hispanic students specific in their gifted programming (placement), and found problems with policies and instruments for

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The Court's decision renewed the *Brown v. Board of Education* (1954) principle that 'separate is inherently unequal'.

... The court finds the District's method of identifying gifted Minority Students was flawed and resulted in an obvious disparate impact on those students by separating them from their gifted White peers.... By singling out most[by] all Hispanic students for the segregated SET/SWAS program, the District deprived these children of that educational opportunity based on their ethnicity (p. 27).

Judge Gettlemen found discrimination

regarding (a) tests for screening and for identification, (b) designated cutoff scores for screening and identification, (c) use of both verbal and math scores at arbitrary designated levels for screening and for identification, (d) use of weighted matrix, as well as content and criteria in weighted matrices that favored achievement and traditional measures, (e) too little reliance on a nonverbal test (Naglieri Nonverbal Ability Test) for admission to SWAS, (f) re-testing Hispanic students for middle school gifted program, (g) timing of testing, (h) use of parental referrals, and (i) use of teacher referrals (see Table 2).

Judge Gettleman's Decision

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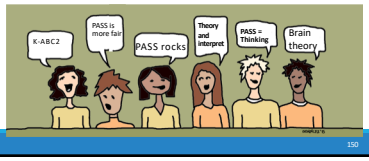
Core Group Activity

- **O**rganizer – Have the group discuss this question: "What thoughts are there about these research studies on Race, IQ and PASS?"
- **C**oach – guide the discussion
- **R**eporter – will record and report to the group
- **E**nergizer – keep the discussion going !



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Topics for Today

Diagnosis

- Behavioral symptoms define the disorder based on DSM-5

Description of the Individual

- Assessment of the Behaviors related to ASD
- Determining if there is a Cognitive Processing Component
  - Cognitive profiles for those with ASD, ADHD, and SLD
- Evaluate Social Communication and Social Interactions
- Ruling out Intellectual Disability
  - A *fair and equitable* way to assess ability for students who may have Autism
- Quantifying "Significant Impairment"

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Rating Scale of Impairment & EF

- "Impairment is a reduced ability to meet the demands of life because of a psychological, physical, or cognitive condition" (Goldstein & Naglieri, 2016, p. 6).
- The American Psychiatric Association in the new DSM-5 (APA, 2013) emphasizes impairment over and above symptom presentation.
- World Health Organization's International Classification of Functioning, Disability and Health (WHO, 2001) also has guidelines for impairment.

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RSI Forms and Norming

- RSI Normative Sample:
  - 2800 ratings
    - 800 ratings for each of the RSI (5-12 Years) Parent and Teacher forms
    - 600 ratings for each of the RSI (13-18 Years) Parent and Teacher forms
- Within 1% the 2010 U.S. Census targets on:
  - Race/ethnicity,
  - Region,
  - PEL
- Includes 11.6%-11.8% of clinical cases

RATING SCALE OF IMPAIRMENT (RSI)			
RSI (5–12 YEARS)		RSI (13–18 YEARS)	
PARENT FORM	TEACHER FORM	PARENT FORM	TEACHER FORM
Number of Items: 41 Reading Level: 5.8 Admin Time: 10 mins.	Number of Items: 29 Reading Level: 6.6 Admin Time: 5 mins.	Number of Items: 49 Reading Level: 5.9 Admin Time: 10 mins.	Number of Items: 29 Reading Level: 6.6 Admin Time: 5 mins.
RSI Scales School Social Mobility Domestic Family	**RSI Scales** School Social Mobility	**RSI Scales** School/Work Social Mobility Domestic Family Self-Care	**RSI Scales** School Social Mobility
TOTAL SCORE	TOTAL SCORE	TOTAL SCORE	TOTAL SCORE

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RSI Correlations (Manual pg. 115)

- RSI is most related to the CEFI and DESSA because all of these are reflections of frontal lobes concept of executive function

RSI Total Score			
Adaptive Behavior		Symptom Scales	
-.54	Adaptive Behavior Assessment System–II	.26	Conners CBRS — Content Scales
		.29	Conners CBRS — Symptom Scales
Social-Emotional Competency		Ability & Achievement	
-.71	Devereux Student Strength Assessment	-.05	Wechsler Intelligence Scale for Children-IV
Symptom Scales		-.06	Woodcock Johnson III Achievement
-.78	Comprehensive Executive Function Inventory	-.03	Cognitive Assessment System

Conclusions

- DSM-5 is used to diagnose ASD
- Additional measures are helpful to more completely describe the individual characteristics that makes each person unique
- This was the goal of today's presentation
- THANK YOU

- One of them is Sebastian, that you might remember from Oslo (PASS 93-91-95-60), with a more typical language problem than autism score on ASRS. He is now in the first year at high school, and has a school setting almost without school subjects. Based on his CAS2 results we have recommended to pick up the school subjects, and described how to do it - hope the school will be able to do so. And I hope the family will let us write a case that we can publish, maybe in an article. A very good example of the utility of CAS2!