



# DETERMINING ADVERSE EDUCATIONAL AND SOCIAL IMPACT: EVIDENCE BASED SOLUTIONS TO DECISION MAKING

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# Disclosures

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Financial:

Author of *Clinical Assessment of Pragmatics (CAPs) test*

Author of *VideoLearningSquad.com* and *VideoAssessmentTools.com*

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# Learner objectives



1. Discuss evidence-based ways to determine adverse educational and social impact
2. Discuss impact-related components of a legally defensible and evidence-based assessment/report
3. List educational and social communication areas that were found to be directly affected by articulation and phonology difficulties
4. Get access to report templates
5. Get access to impact rating scales

## Access to resources

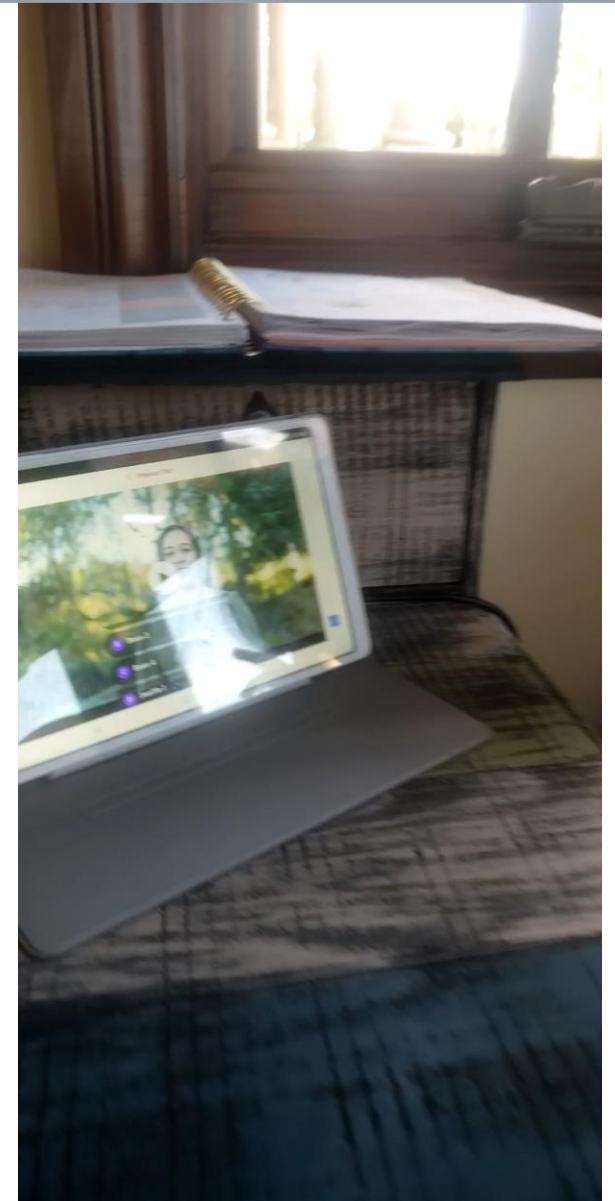
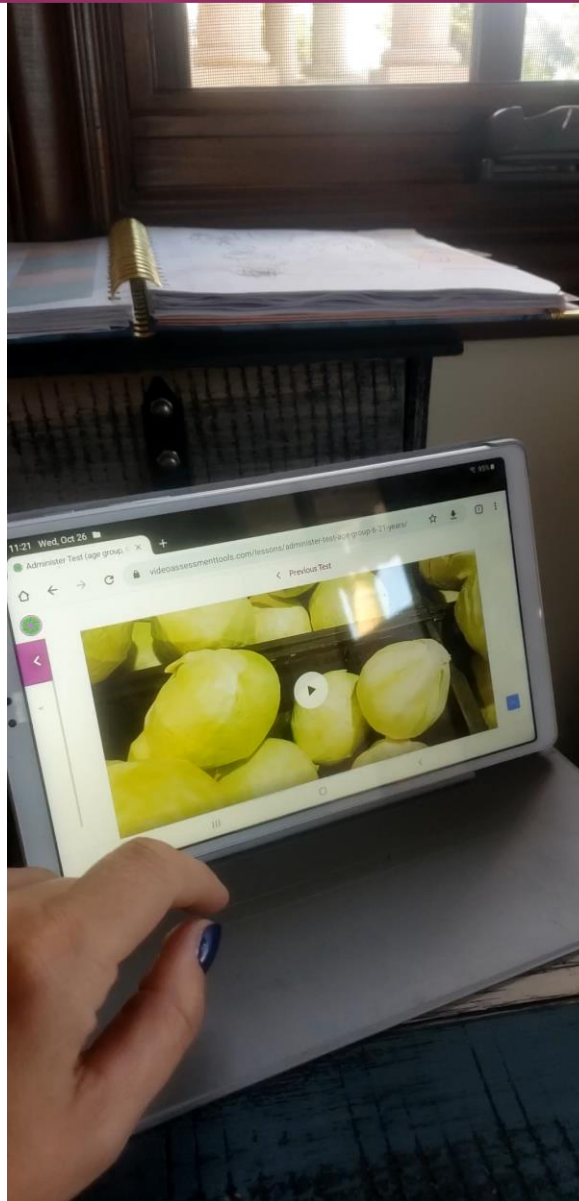
1. Report templates
2. Sample goals
3. Presentation slides
4. Impact related rating scales
5. Online teacher/parent questionnaires

<https://VideoAssessmentTools.com/access>

## CASE STUDY I

- Male student, age: 9, 3<sup>rd</sup> grade
- GFTA: SS=69
- Articulation and Phonology Video Assessment Tool: SS=76
- Report card: all areas including social-emotional and language arts reported as “3/meeting standard”
- Student self-rating: “ My speech sounds good, I don’t need any help”

# CASE STUDY I





## CASE STUDY 2

- Male student, Age: 6, 1<sup>st</sup> grade
- GFTA: SS=85
- Articulation and Phonology Video Assessment Tool: SS=77
- Student self-rating: “ I tell kids I’m British so they don’t make fun of me”

Reporting Period		1	2
<b>SOCIAL/EMOTIONAL</b>			
Displays impulse control and self-regulation	Effort	S+	O
Expresses emotions in an appropriate way		2+	3
Cooperates and shares with others		2+	3
Participates positively in group settings		3	3
Engages in meaningful relationships with adults		3	3
<b>LANGUAGE AND LITERACY</b>			
Responds to one and two step oral commands	Effort	O	O
Speaks clearly to be understood by others		3	3
Uses descriptive language and vocabulary		2+	3
Alphabet knowledge: upper case recognition		3	4
Alphabet knowledge: lower case recognition		3	3
Alphabet knowledge: letter sounds		3	4
Writes letters and draws pictures to communicate		3	3
Writes own name legibly		4	4
Displays comprehension regarding key components of text		NA	3
<b>MATHEMATICS</b>			
Counts orally to twenty	Effort	O	O
Counts with one to one correspondence to ten		3	3
Writes numbers one through ten		3	4
Understands simple concepts of addition and subtraction		NA	NA
Demonstrates concept of time and days of the week		2	2+
Names primary shapes and describes characteristics		4	4
Makes and describes simple patterns		2	3
Expresses mathematical reasoning and abstract reasoning		NA	3
Recognizes numbers 1-10		4	4
<b>VISUAL AND PERFORMING ARTS</b>			
Engages in art activities and completes projects	Effort	O	O
Use art tools and resources appropriately		3	3
Sings age appropriate songs from memory		3	3

Reporting Period		1	2
<b>PHYSICAL DEVELOPMENT</b>			
Understands differences between real and imaginary characters	Effort	O	O
Performs simple movements to oral instructions		3	3
Shows confidence in locomotor skills (running, jumping, hopping)		3	3
Demonstrates body awareness and personal boundaries during play		3	3
Demonstrates directional awareness (front, behind, over, etc.)		3	3
Shows increased fine motor ability		3	3
Sustains gross motor activity over a period of time		3	3
<b>HEALTH EDUCATION</b>			
Practices personal hygiene skills	Effort	O	O
Identifies safety rules/symbols at home and at school		3	3
Identifies healthy food choices		NA	3
<b>HISTORY-SOCIAL SCIENCE</b>			
Follows rules and takes turns	Effort	O	O
Accepts responsibility for behavior		3	2+
Understands how to be a good citizen		3	2+
Respects rights, diversity, feelings and property of others		3	3
Describes familiar locations in their community		NA	NA
Understands concepts of money		NA	NA
<b>SCIENCE</b>			
Demonstrates ability to make predictions	Effort	O	O
Demonstrates ability to observe, investigate and describe physical properties (size, weight, shape)		3	3
Describes similarities and differences of living things		NA	3
Describes environmental objects using sensory language		NA	3

## CASE STUDY 2





Why is the determination  
of educational and social  
**IMPACT** during the  
assessment process  
needed?

# WHY ANALYZE IMPACT?

- To comply with the law
- To conduct and develop evidence-based and legally defensible assessment/reports
- To comply with LRE (least restrictive environment)

## FEDERAL LAW (20 USC §1414(B)) REQUIRES SCHOOL DISTRICTS TO DO THE FOLLOWING:

1. Use a variety of assessment tools and strategies to obtain relevant, functional and developmental information and academic instruction;
2. Include information provided by the parent that may assist in determining whether the child is a child with a disability and the content of the child's IEP;
3. Include information related to enabling the child to be involved in and progress in the general curriculum, or, for preschool children, to participate in appropriate activities;
4. Not use any single procedure as the sole criterion for determining whether a child is a child with a disability or determining an appropriate educational program for the child, and to use technically sound instruments that may assess the relative contribution of cognitive and behavioral factors, in addition to physical or developmental factors.

# INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

- Three prongs for eligibility:
  - (1) Have an impairment, that
  - (2) results in an education impact, that
  - (3) requires specially designed instruction (34 CFR S300.8)

- IDEA Definition for SLI:

34 C.F.R. §300.7 Child with a disability. (c) Definitions of disability terms. (11) Speech or language impairment means a communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, that *adversely affects a child's educational performance*.

# INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

- IDEA does not allow the use of any one measure or assessment as the sole criterion in determining if a child has a disability or in determining an appropriate education program (U.S. Department of Education, 2006. CFR 300.304 b. 2).
- Thus, it is required that IEP teams use a variety of both formal and informal assessment tools (U. S. Department of Education, 2006; 34 CFR §300.304 b).
- For example, school-based SLPs can conduct classroom observations, checklists, play-based assessments, language samples, standardized and norm reference tests, narrative assessments, and speech intelligibility measures.
- IDEA (2004) states that when assessing a student for a speech or language impairment, we need to determine **whether or not the impairment will negatively impact the child's educational performance.**



## INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

Neither federal nor state law defines the term  
“adversely affect educational performance.”

So, a review of the court cases interpreting this  
phrase is necessary to understand how it has been  
applied

# INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

- Courts have interpreted the phrase to mean that education is adversely affected if, without certain services, the child's condition would prevent her from performing academic and nonacademic tasks and/or from being educated with non-disabled peers. [*Yankton School District v. Schramm*, 93 F.3d 1369 (8th Cir. 1996).]
- In California, the administrative hearing office has found poor grades to be a primary indicator of an adverse effect on educational performance. [*Lodi Unified Sch. Dist.*, SN 371-00; *Capistrano Unified Sch. Dist.*, SN 686-99, 33 IDELR 51; *Ventura Unified Sch. Dist.*, SN 1943-99A; *Murrieta Valley Unified Sch. Dist.*, SN 180-95, 23 IDELR 997.]
- Poor grades and falling behind academically are also examples of adverse effect on educational performance. [*Enterprise Elem. Sch. Dist.*, SN 1055-89.] In addition, a student's condition, which caused declining grades and conduct at school, resulted in an adverse effect on educational performance. [*Sierra Sands Unified Sch. Dist.*, SN 1367-97, 30 IDELR 306.]

# INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

- Although grades and, standardized test scores may be one measure of educational performance, the law and the courts take a broader view.
- Although some students test well when taking standardized tests, the law does not require poor standardized test scores in order to find an adverse effect on educational performance. The courts have established that a child's educational needs include academic, social, health, emotional, communicative, physical, and vocational needs. [*Seattle School Dist. No. 1 v. B.S.*, 82 F.3d 1493, 1500 (9th Cir. 1996).]

# INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

- Federal special education law also distinguishes between “educational” performance and “academic” performance and establishes that “educational” performance is a broad concept.
- Congress and the California Legislature used the broader term “educational performance” in eligibility definitions. In addition to grades and standardized tests scores, schools must consider how a child’s emotional, health or other conditions adversely affect her non-academic performance in social, behavioral and other domains as well.

# INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA, 2004)

- For example, a response to ASHA's request "The extent of a child's mastery of the basic skill of effective oral communication is clearly includable within the standard of 'educational performance' set by the regulations – that is, academic failure is not a prerequisite for services. It remains the Department's position that the term 'educational performance' is not limited to academic performance. Services cannot be denied as a matter of policy because the adverse effect on educational performance is not reflected in grades or academic achievement."
- E.g., Articulation errors drawing negative attention to the child
- E.g., Embarrassment and potential fear of class participation due to articulation errors
- E.g., Reduced confidence in speaking in class or in small group settings due to articulation errors.



# COMMON MISCONCEPTIONS/MISUNDERSTANDINGS

- **use of 2 standardized tests for eligibility purposes** because IDEA says to not use single measures! - THE IDEA SAYS NOTHING ABOUT USING MULTIPLE TESTS or using 2 of the same types of tools/strategies, THE IDEA SAYS TO USE A VARIETY OF TOOLS/STRATEGIES!
- use of “severity rating” as a criterion for eligibility - THE IDEA SAYS NOTHING ABOUT SEVERITY as it relates to eligibility

## THIS IS WHAT THE LAW ACTUALLY SAYS:

- (b)(2)(A) use a variety of assessment tools and strategies....
- (b)(2)(B) not use a single measure or assessment as a single criterion...
- (b)(2)(C) use technically sound instruments that may assess...
- (b)(3)(A)(i) ...not to be discriminatory...
- (b)(3)(A)(ii) .. in the language and form most likely to yield accurate information...
- (b)(3)(A)(iii) ... are valid and reliable;
- (b)(3)(A)(v) are administered in accordance with any instruction by producer...
- (b)(3)(D) assessment tools and strategies that provide relevant information that directly assists persons in determining the educational needs...

(20 U.S.C. §1414(b))

## ADDITIONAL PROCEDURE: REQUIREMENTS

- A) review existing evaluation data on the child, including—
  - (ii) current classroom-based, local, or State assessments, and classroom-based observations; and
  - (iii) observations by teachers and related services providers; and..
- (20 U.S.C. §1414(c)(1))

How can we analyze the impact of a speech and language disorder in an objective and fair way?

# HOW CAN WE JUDGE THE IMPACT OF A SPEECH AND LANGUAGE DISORDER IN AN OBJECTIVE AND FAIR WAY?

Language/Speech  
Samples,  
Narrative  
Analysis

Report Cards,  
Work Samples,  
State Testing

Parent & Teacher  
Input

Curriculum  
based measures

Clinical  
Impressions/  
Observations



# WORK SAMPLES: ACADEMIC MATERIALS, ASSIGNMENTS

- Extremely helpful and important in determining impact

Analysis of school performance includes reviewing educational records, collecting evidence of academic performance (including documents from class assignments, independent and group work, homework, class tests, and portfolios of class performance), and completing observations across a variety of educational contexts (classes, playground, extra-curricular activities, lunch, etc.). These observations provide insight into the student's speech language performance during real communication tasks. (**Virginia Department of Education, 2011**)

# WORK SAMPLES: ACADEMIC MATERIALS, ASSIGNMENTS

- Classwork that demonstrates limited ability when compared to the performance of grade level peers on the same measure

# STANDARDIZED TESTS

- Researchers are suggesting that norm-referenced measures should have at least 80% accuracy in discriminating language abilities (**Spaulding, Plante, & Farinella, 2006**).
- Speech-language pathologists should review assessment instruments and consider the diagnostic accuracy, sensitivity, and specificity prior to use in educational evaluations (**Spaulding et al., 2006**).
- “Standardized speech-language tests measure decontextualized communication skills using formalized procedures. Administered outside the normal contexts in which the child communicates, they capture neither the complexities nor the subtle nuances of the communication process,” (**Connecticut State Department of Education, 2008**, p. 23).

## Misunderstandings related to standardized tools

- **normative group characteristics**

the makeup of "normative" groups influences how tests function. If Test A includes people with disabilities in the "normative" group based on the rationale that it better represents the full population, but Test B excludes people with the target disorder from the normative group, Test B will be more sensitive to the disorder, whereas Test A will be more likely to find the child with the disorder to be a member of the "normative group."

## Misunderstandings related to standardized tools

- **diagnostic accuracy is conveyed by evidence of sensitivity and specificity for specific cut scores on validated tests; not arbitrary rules**

because tests standardized on different normative groups cannot be compared directly, neither should system policies dictate such things as that a child must score 1.25 SD below the mean to meet criteria for eligibility. Rather, each test should publish the cut scores and core tests that yield the best balance between sensitivity (fewest false negatives) and specificity (fewest false positives) and these are the values that should be used when interpreting that test.



# IMPORTANCE OF OBSERVATIONS AND RATIONALE FOR A RATING SCALE

- A speech and language evaluation should include systematic observations and a contextualized analysis that involves multiple observations across various environments and situations (Westby et al., 2003).
- According to IDEA (2004), such types of informal assessment must be used in conjunction with standardized assessments.
- Section. 300.532(b), 300.533 (a) (I) (I, ii, iii); 300.535(a)(I) of IDEA states that, “assessors must use a **variety of different tools and strategies** to gather relevant functional and developmental information about a child, including **information provided by the parent, teacher,** and information obtained from classroom-based **assessments and observation.**”
- By using both formal and informal assessments, clinicians are able to capture a larger picture of a student’s speech and language abilities.

## THE IMPACT MODEL (Lavi, 2020)

It is designed to analyze the real-life authentic observations of clinicians, parents, and teachers.

Developed based on current literature and examination of real-world challenges faced by individuals with speech and language impairments.

Uses a contextualized, whole language approach to see the impact and the outcome of a speech and/or language impairment on education and social interactions.

# RESEARCH AND DEVELOPMENT OF THE IMPACT RATING SCALES

- We began by conducting a thorough research review for each scale's focus (i.e., Social Communication, Articulation and Phonology, Language Functioning).
- Next, we analyzed the most predictive areas in education and social interactions that are affected by poor articulation and phonology, oral expression and spoken language comprehension, and social communication, respectively.
- Additionally, we asked teachers and parents to complete surveys to provide their input on the potential impact of deficits in these areas.

# RESEARCH AND DEVELOPMENT OF THE IMPACT RATING SCALES

- Based on our research review, analysis, and input from teachers and parents, we developed and compiled a list of questions.
- A pilot study was then conducted with over 100 students for each of our rating scales.
  - Items were reviewed for content quality, clarity and lack of ambiguity, and sensitivity to cultural issues.
  - Once the pilot studies were validated, some questions were eliminated and supplemental questions were added.
  - Then, a final list of questions was prepared and finalized for each rating scale.
  - The scales were then normed in the second phase of the standardization project.

# THE IMPACT ARTICULATION & PHONOLOGY RATING SCALE

- By observing a child's speech sounds via informal observation, examinees (i.e., clinician, teacher, and parent) can observe the types of sound errors a student makes, as well as the potential impact the speech sound disorder may have on a child's academic and social life.
- When we consider a formal articulation assessment, it may be difficult for clinicians to observe and gauge the impact of these errors on a student's everyday life.
- Parent and teacher input can be beneficial during a speech assessment because it allows for the observations to take place in an authentic setting.
- Additionally, the examiners are already familiar with the child and may know what to look for which, creates a true representation of the child's speech skills.

# IMPACT ARTICULATION & PHONOLOGY RATING SCALE



Speech  
characteristics



Social  
interactions



Academics



Home and after  
school life

# IMPACT ARTICULATION & PHONOLOGY RATING SCALE



## ***Speech Characteristics***

- Example from Parent Rating Scale: When speaking to a *familiar* family member or family friend within an unknown context, how well understood is your child? For example, when your child is speaking to someone they are familiar with (e.g., sibling, grandparent, aunt, neighbor, etc.) in a new or different setting, how well can the family member/friend understand your child?

# IMPACT ARTICULATION & PHONOLOGY RATING SCALE



## ***Social Interactions***

- Example from Teacher Rating Scale: Does the student appear to avoid social situations that require speaking with others (e.g., peers, adults, family members)? For example, does the student avoid spending time with friends at lunch, at recess, or after school so they don't have to speak to others?



# IMPACT ARTICULATION & PHONOLOGY RATING SCALE



## ***Academics***

- *Example from Teacher Rating Scale:* Does the student appear confident when answering questions during class? For example, during class discussions, the student is able to talk about characters, and answer questions to participate in discussions with confident speech.

# IMPACT ARTICULATION & PHONOLOGY RATING SCALE



## ***Home and After School Life***

- *Example from Parent Rating Scale:* Is your child reluctant to participate in after school activities that require speaking with others? For example, your child may want to join a basketball team but chooses not to because he/she is nervous to speak in front of others/be made fun of/feel embarrassed/etc.

# THEORETICAL & CONTEXTUAL BACKGROUND

## IMPACT ARTICULATION & PHONOLOGY RATING SCALE

- A speech sound disorder is a widely used term that encompasses the difficulty, or combination of difficulties, with perception, production, and/or phonological representation of speech sounds and speech segments (American-Speech-Hearing Association [ASHA], 2016).
- Speech sound disorders encompass speech related delays, disorders, and impairment (McLeod & Baker, 2017).
- When the cause of speech sound disorders is unknown, they are referred to as either articulation or phonological disorders.
  - Articulation errors may result in sound distortions, substitutions, and omissions of individual speech sounds (ASHA, 2016).
  - Phonological errors are often described as predictable and result from difficulties in the comprehension and use of a speech sound system and its governing rules (Bauman-Waengler, 2004). For example, a child with a phonological disorder may engage in gliding or stopping of speech sounds.

# THEORETICAL & CONTEXTUAL BACKGROUND

## IMPACT ARTICULATION & PHONOLOGY RATING SCALE

- Early on in childhood, school plays a significant role in a child's development, and will have a significant impact on a child's educational achievement, future, and society (Grunewald & Rolnick, 2007).
- By the time children reach school age, most are considered to be competent communicators, however, some children's speech and language skills are behind those of their peers (McLeod & McKinnon, 2007).
- Articulation and phonological disorders are often diagnosed in preschool and school-aged children between 2:0 and 21:0 years old.

# THEORETICAL & CONTEXTUAL BACKGROUND

## IMPACT ARTICULATION & PHONOLOGY RATING SCALE

- A recent study found that in the United States of America, three-quarters of 6,624 pre-kindergarten students that were enrolled in education-based programs across 25 states received speech-language pathology services for “articulation/intelligibility” (Mullen & Schooling, 2010).
- When compared to typically developing children, these students with speech sound disorders are at higher risk for reduced educational and social outcomes (Felsenfeld, Broen & McGue, 1992; 1994; McCormack, McLeod, McAllister, & Harrison, 2009).
- Previous research has suggested that speech sound disorders can negatively impact a child’s academic skills as well as their social and personal life. For example, students with speech sound disorders may have difficulty with phonological awareness, reading, and spelling (Peterson, Pennington, Shriberg, & Boada, 2009; Bird, Bishop, Freeman, 1995; Nathan, Stackhouse, Goulondris, & Snowling, 2004; Anthony, Aghara, Dunkelberger, Anthony, Williams & Zhang, 2011). Additionally, these students may interact with their peers less due to fears of being made fun of or being bullied.

# THEORETICAL & CONTEXTUAL BACKGROUND

## IMPACT ARTICULATION & PHONOLOGY RATING SCALE

- As a result, these students are more likely to require additional support at school (Felsenfeld et al., 1994). Additionally, these children are more likely to experience frustration (McCormack, McLeod, McAllister & Harrison, 2010) and are more likely to be bullied (Sweeting & West, 2001). Students with speech-sound disorders may feel at ease at home with people they are familiar with, and feel more reserved in public spaces with unfamiliar people (McLeod, Daniel & Barr, 2013).
- Because of these factors, the *IMPACT Articulation and Phonology Rating Scale* has clinicians, teachers, and parents look at a child's speech characteristics, as well as the impact of a speech disorder on a child's social interactions, academic life, and home/after school life.
- During assessment and intervention planning, it is important to consider how articulation and phonology may adversely affect educational performance and a child's social interactions.

# THEORETICAL & CONTEXTUAL BACKGROUND

## IMPACT ARTICULATION & PHONOLOGY RATING SCALE

- For example, preschool children with speech sound disorders are at a higher risk for difficulties with phonological awareness, which can lead to difficulties with spelling and reading (Peterson, Pennington, Shriberg, & Boada, 2009; Bird, Bishop, Freeman, 1995; Nathan, Stackhouse, Goulondris, & Snowling, 2004). Additionally, McLeod, Daniel, and Barr (2013) found that when children with speech sound disorders are in public settings, they may become frustrated and develop avoidant behaviors including withdrawal in public environments. Parents reported that when their children were in public situations, they felt the need to protect their children in response to the reactions of others, specifically in relation to their child's social and emotional wellbeing (McLeod, Daniel, & Barr, 2013).

# PSYCHOMETRIC PROPERTIES

- When selecting an assessment for an evaluation, it is important to consider whether it is truly a *good* assessment tool.
- A good assessment is one that produces results that will benefit the individual being tested or society as a whole (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education [AERA, APA, and NCME], 2014).
- There are a few ways we can examine whether a test is considered a good and strong assessment. We can take a look at the standardization, normative information, and the psychometric properties of each test.



# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

## ***Normative Sample***

- Previous research has suggested that the inclusion of children with disabilities in a normative sample can have a negative impact on a test's ability to differentiate between children with disorders and children who are typically developing (Peña, Spaulding, & Plante, 2006). Thus, normative data for the *IMPACT Rating Scales* was based solely on typically developing children to allow for high sensitivity and specificity.
- Since the purpose of the *IMPACT Rating Scales* is to help to identify speech and language disorders and the impact of these disorders, it was critical to exclude students from the normative sample who had diagnoses that are known to influence each area of speech and language (Peña, Spaulding, & Plante, 2006).
- For example, students who had previously been diagnosed with a specific language impairment or learning disability were not included in the normative sample for the *IMPACT Rating Scales*. Further, students were excluded from the normative sample if they were diagnosed with autism spectrum disorder, intellectual disability, hearing loss, neurological disorders, or genetic syndromes.

# Normative Sample

Table 4.1			
Representation of the Sample, by Age Group			
Age Group	Age	N	%
1	5-0 to 5-11	92	10
2	6-0 to 6-11	104	11.3
3	7-0 to 7-11	82	8.9
4	8-0 to 8-11	93	10.1
5	9-0 to 9-11	87	9.5
6	10-0 to 10-11	71	7.7
7	11-0 to 11-11	76	8.2
8	12-0 to 12-11	75	8.1
9	13-0 to 13-11	68	7.4
10	14-0 to 14-11	71	7.7
11	15-0 to 21-0	98	10.6
Total Sample		917	100%

917 typically developing examinees across 11 age groups (in 17 states (Arizona, California, Colorado, Nevada, Idaho, Illinois, Iowa, Kansas, Ohio, Minnesota, Florida, New York, Pennsylvania, Florida, South Carolina, Texas, Washington)).

# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

## *Sensitivity and Specificity*

- Strong sensitivity and specificity (i.e., 80% or stronger) is needed to support the use of a test in its identification of the presence of a disorder or impairment.
- Sensitivity measures how well the assessment will accurately identify those who truly have a speech sound disorder (Dollaghan, 2007).
- Specificity measures the degree to which the assessment will accurately identify those who do not have a speech sound disorder, or how well the test will identify those who are “typically developing” (Dollaghan, 2007).

# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

**Table 5.1 IMPACT Articulation and Phonology Rating Scale sensitivity, specificity and likelihood ratios**

Age group	Cut score	Sensitivity	Specificity	Positive likelihood ratio	Negative likelihood ratio
5:0-5:11	77	84	81	4.21	.14
6:0-6:11	77	81	84	4.34	.13
7:0-7:11	78	84	83	5.67	.09
8:0-8:11	77	85	81	5.34	.12
9:0-9:11	78	90	82	4.18	.14
10:0-10:11	77	89	80	5.67	.12
11:0-11:11	77	84	86	5.39	.09
12:0-12:11	77	87	90	4.06	.07
13:0-13:11	78	91	86	5.78	.14
14:0-14:11	78	92	83	5.67	.15
15:0-15:11	77	89	81	5.71	.08
16:0-21:0	77	88	80	6.07	.11

## Scaled Score Means (and Standard Deviations) of Subtests for Two Clinical Groups and a Demographically Matched Typically Developing Group, (N= 212)

	AI group (n=42)	HL (n=18)	SIP (n=34)	TD group (n=57)	p-value*
Clinician <sup>a,b,c</sup>	72 (4.1)	69 (3.2)	70 (3.1)	100 (0.8)	<.001
Teacher <sup>a,b,c</sup>	69 (3.4)	67 (4.1)	71 (3.6)	101 (1.0)	<.001
Parent <sup>a,b,c</sup>	73 (3.8)	69 (4.2)	69 (0.8)	100 (0.6)	<.001

**Table 5.3:** Clinician, Teacher, and Parent Rating Scale Comparison across Clinical and Typically-Developing groups (N=212)

Abbreviation: AI, articulation impairment; HL, hearing loss; SIP, speech impairment secondary to phonological processes;

TD, typically developing;

\*Kruskal-Wallis Analysis of Variance test

<sup>a</sup> significant difference between AI and TD groups

<sup>b</sup> significant difference between HL and TD groups

<sup>c</sup> significant difference between SIP and TD groups

# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

## ***Content Validity***

- The validity of a test determines how well the test measures what it purports to measure. Validity can take various forms, both theoretical and empirical. This can often compare the instrument with other measures or criteria, which are known to be valid (Zumbo, 2014). Expert opinion was elicited for all of the IMPACT Rating Scales.
- For example, 29 speech language pathologists (SLPs) reviewed the *IMPACT Articulation and Phonology Rating Scale*.
  - All SLPs were licensed in the state of California, held the Clinical Certificate of Competence from the American Speech-Language-Hearing Association, and had at least 5 years of experience in assessment of children with speech sound disorders.
  - Each of these experts was presented with a comprehensive overview of the rating scale descriptions, as well as rules for standardized administration and scoring.
  - They all reviewed 6 full-length administrations.

# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

## ***Content Validity cont'd***

- Following this, they were asked 30 questions related to the content of the rating scale and whether they believed the assessment tool to be an adequate measure of speech sound disorders. For instance, their opinion was solicited regarding whether the questions and the raters' responses properly evaluated the impact of speech sound disorders on educational performance and social interaction. The reviewers rated each rating scale on a decimal scale.
- All reviewers agreed that the *IMPACT Articulation and Phonology Rating Scale* is a valid informal observational measure to evaluate speech skills and to determine the impact on educational performance and social interaction, in students who are between the ages of 5 and 21 years old.

# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

## ***Criterion Validity***

- Criterion validity measures how well one measure predicts an outcome for another measure.
- In assessing criterion validity, the *IMPACT Articulation and Phonology Rating Scale* was correlated to other measures of articulation and phonology: *Arizona Articulation and Phonology Scale - Fourth Edition* (Arizona-4; Fudala & Stegall, 2017) and the *Diagnostic Evaluation of Articulation and Phonology* (DEAP; Dodd, Holm, Crosbie, & Ozanne, 2003).
- Time between test administrations ranged from the same day to 5 days.
- The concurrent validity was assessed using Pearson's correlation among all measures. Correlation coefficients of  $\geq 0.7$  are recommended for same-construct instruments while moderate correlations of  $\geq 0.4$  to  $\leq 0.70$  are acceptable. The level of significance was set at  $p \leq 0.05$ . When assessing validity, the *IMPACT Articulation and Phonology Rating Scale* was substantially correlated with the *DEAP* and the *Arizona-4*: 0.87, and 0.83 respectively,  $p < 0.001$ .



# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

## ***Response Bias***

- Research has also suggested that we consider the potential impact of biases when evaluating an assessment tool.
- Responses to questionnaires, tests, and scales, may be biased for a variety of reasons. For example, response bias may occur consciously or unconsciously and when it does occur, the reliability and validity of our measure will be compromised.
- The *IMPACT Rating Scales* use balanced set of questions in order to protect against response biases.
- A balanced scale is a test or questionnaire that includes some items that are positively keyed and some items that are negatively keys.

# PSYCHOMETRIC PROPERTIES OF THE IMPACT RATING SCALES

- Here is an example taken from the *IMPACT Social Communication Rating Scale*. Items on this scale are rated on a 4-point scale ("never," "sometimes," "often," and "typically"). Now, imagine if we asked a teacher to answer the following two items regarding one of their students:
  1. Appears confident and comfortable when socializing with peers.
  2. Does not appear overly anxious and fidgety around group of peers.
- Both of these items are positively keyed because a positive response indicates a stronger level of social language skills. To minimize the potential effects of acquiescence bias ("yea-saying and nay-saying" when an individual consistently agrees or disagrees [Danner & Rammstedt, 2016]), the test creator may revise one of these items to be negatively keyed. For example:
  1. Appears confident and comfortable when socializing with peers.
  2. Appears overly anxious and fidgety around group of peers.
- Now, the first item is keyed positively and the second item is keyed negatively. The revised scale, which represents a balanced scale, helps control acquiescence bias by including one item that is positively keyed and one that is negatively keyed.
- To read more about the psychometric properties of each *IMPACT Rating Scale*, please review the technical manual for each scale.