

# CELF-4 in a Multi-Perspective Assessment Process

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# Multidimensional Language Assessment Perspectives

- ◆ Clinical
- ◆ Cognitive
- ◆ Brain-Behavior/Neuropsychological
- ◆ Educational
- ◆ Social

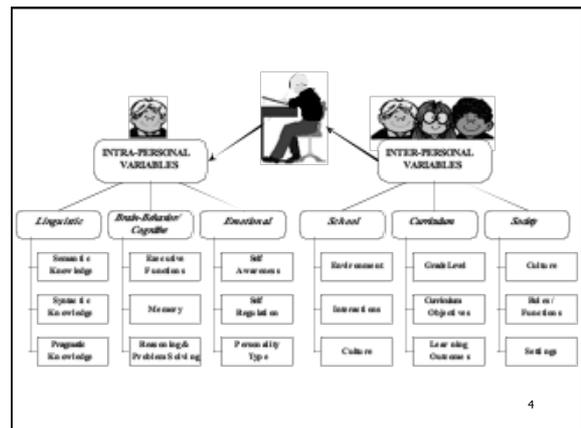
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Student



Centered

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# A Clinical Perspective

Speech



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# A Clinical Perspective

- Question 1.** *Is there evidence of a language disorder?*  
Total Language, Receptive or Expressive (Modalities)
- Question 2.** *What is the nature of the disorder?*  
Language Strengths and Weaknesses (Content)  
Syntax, Morphology, Semantics, Language & Memory
- Question 3.** *How does this student's performance compare with that of his/her peers?*  
Educational level of performance compared to age and grade peers
- Question 4.** *Does the student's clinical performance profile meet criteria for eligibility for speech and language services?*

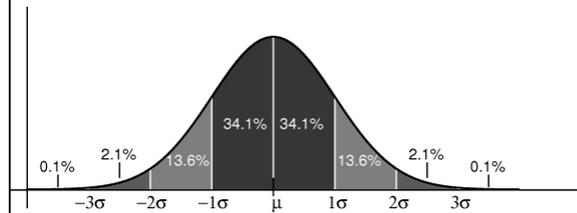
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## Clinical Assessment Process

- |  |   |
|--|---|
| <p>1. <i>Is there a language disorder?</i></p> <p>2. <i>What is the nature of the disorder?</i><br/>         Receptive and Expressive<br/>         Listening and Speaking<br/>         Reading and Writing<br/>         Syntax, Morphology,<br/>         Semantics<br/>         Language and Memory</p> <p>3. <i>What are the language strengths and weaknesses?</i></p> | <p><b>1. Core Language Score</b></p> <p><b>2. Language Composite/ Index Scores</b></p> <ul style="list-style-type: none"> <li>• Modality Bases</li> <li>• Linguistic Bases</li> <li>• Memory Interfaces</li> </ul> <p><b>3. Profiling</b></p> |
|--|---|

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## The Normal Curve Distribution



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## Standard Scores and Educational Performance Ranges

- **Above Educational Average**  
Standard score 115 and above (+1 SD above mean)
- **Average Educational Range**  
Standard score 86 to 114 (within +/-1 SD of mean)
- **Marginal Educational Range**  
Standard score 79 to 85 (within -1 to -1.5 SD of mean)
- **Low Educational Range**  
Standard score 71 to 78 (within -1.5 to -2 SD of mean)
- **Very Low Educational Range**  
Standard score 70 and below (-2 SD below mean)

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## A DILEMMA!



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## CELF-4 Scandinavian Summary

- Design: Designed as a parallel to CELF-4 English
- Subtests: Features nine subtests designed to probe linguistic abilities
- Working Memory component - only language test that looks at the contribution of auditory memory to language ability
- Brain-behavior relationships - only language test that evaluates comorbidities related to executive functioning (attention, working memory, set-shifting)
- Includes a pragmatics checklist

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## CELF-4 Scandinavian Content

1. Begrebsforståelse og forståelse af instruktioner
  2. Grammatiske strukturer
  3. Tekstforståelse
  4. Ligheder 1
  5. Ligheder 2
  6. Formulere sætninger
  7. Repetition af sætninger
  8. Ekspresivt ordforråd
  9. Sætningsstruktur
- Ordmobilisering (kategorier)  
 Hurtig benævnelse (RAN)  
 Ciffergentagelse (talspændvidde, forfra/bagfra)  
 Velkendte rækkefølger (talrækker, ugedage, måneder)  
 Pragmatisk Profil

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## CELF-4 Configuration for Ages 5 to 8

### Subtests

- Forståelse af instruktioner (Following Directions)
- Grammatiske strukturer (Word Structure)
- Talspændevide (Digit Recall)
- Ligheder 1 (Relating Words)
- Kendte sekvenser (Familiar Sequences)
- Produktion af sætninger (Formulated Sentences)
- Gentagelse af sætninger (Recalling Sentences)
- Hurtig benævnelse (Rapid Automatic Naming)
- Produktivt ordforråd (Expressive Vocabulary)
- Sætningsforståelse (Sentence Comprehension/Structure)
- Ordmobilisering (Word Associations)

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## CELF-4 Configuration for Ages 9 to 12

### Subtests

- Forståelse af instruktioner (Following Directions)
- Tekstforståelse (Understanding Spoken Paragraphs)
- Talspændevide (Digit Recall)
- Ligheder 2 (Relating Words)
- Kendte sekvenser (Familiar Sequences)
- Produktion af sætninger (Formulated Sentences)
- Gentagelse af sætninger (Recalling Sentences)
- Hurtig benævnelse (Rapid Automatic Naming)
- Produktivt ordforråd (Expressive Vocabulary)
- Ordmobilisering (Word Associations)

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**Begrebsforståelse og Forståelse af instruktioner**

**Start** Øveopgave 1-3 og derefter Opgave 1

**Materiale** Støvsugning 1

**Gentagelser** Ingen

**Afbyrd** Afbyrd Ikke

**Bemærk:** Væst med at administrere næste opgave til det er helt tydeligt at barnet har afgivet et svar.  
Sæt ring omkring 1 point for rigtigt svar og 0 point for forkert eller intet svar.

1. Peg på skoen der er ring om. Nu.

1. Peg på skoene med ring rundt om. Nu.

1. Peg på skoene som er indtegnet. Nu.

**Begrebsforståelse og forståelse af instruktioner**

**Svarmøgle**

▼ = indikerer at svaret kan gives i hvilken som helst rækkefølge  
1, 2, 3 = indikerer den rækkefølge som svaret skal gives i og = begge billeder skal indgå i svaret

11. Peg på husene som er understreget. Nu.

11. Peg på husene som er understreket. Nu.

11. Peka på husene som är understreka. Nu.

54. Peg på skoen og bolden efter at du har peget på den store fisk og den lille sorte fisk. Nu.

54. Peg på skoen og ballen efter at du har pekt på den store fisken og den lille svarte fisken. Nu.

54. Peka på skon och bollen efter det att du har pekat på den stora fisken och den lilla svarta fisken. Nu.

**Grammatiske strukturer**

**A. Regelmæssig flertal**

**Demonstrationsopgave**

Her er en pige. Her er to piger.

1. Her er en bamse. Her er to \_\_\_\_.  
Bamser

2. Her er en bil. Her er to \_\_\_\_.  
Biler

**C. Nutid**

9. Den her pige plejer at svømme hver dag. Hvad gør hun idag?  
Svømmer

10. Den her dreng plejer at læse hver dag. Hvad gør han idag?  
Læser

**Grammatiske strukturer**

**D. Ejestedord**

**Demonstrationsopgave**

Drengen siger: Den her kasket er min. Og den der kasket er din.

14. Det her er hans popcorn. Og den sodavand er \_\_\_\_.  
Hendes

**E. Regelmæssig datid**

**Demonstrationsopgave**

Den her dreng plejer at cykle hver dag. Hvad gjorde han i går? Han cyklede.

## Grammatiske strukturer

### G. Fremtid

#### Demonstrationsopgave

Drengen klatrer op på rutschebanen. Hvorfor gør han det? Han skal lære ned.



G. Fremtid	Point
24. Skal spise	1 0
25. Skal samle op	1 0
26. Skal dykke/springe	1 0
27. Skal plukke æbler	1 0



## Grammatiske strukturer

### H. Komparation

#### Demonstrationsopgave

Det her træ er højt, det her er højere, og det her er højest.



29. Den her bogen er tyk, den her er tykkere og den her er \_\_\_\_ Tykket



#### Udpegning

### I. Negation

33. Peg på fisken som ikke er gul.



### J. Verken eller

36. Peg på katten som hverken er sort eller grå.

## Ligheder 1

### Start

Demonstrationsopgave, Øveopgave 1-2 og derefter Øpgave 1

### Materiale

Stemulæbog 2

### Gestagøbler

Tilbage

### Måryd

Åbryd ikke

#### Demonstrationsopgave

Sig: Nu vil jeg sige nogle ord og vise dig nogle billeder. To af ordene som jeg siger passer sammen. Kig på billederne og hør godt efter når jeg siger ordene: hvide, fra, hund (peg samtidig på billederne: et ad gangen). Hvidt og hvidt er de ord som passer bedst sammen. Hvidt og hund er begge hunde, én er stor (peg på hunden) og én er lille (peg på hvalpen).



16. skole kage vej lærer  
Hvordan passer \_\_\_\_ og \_\_\_\_ sammen?

## Formulere sætninger

#### Demonstrationsopgave

Sig: Her er et billede af nogle børn som er på biblioteket. Nu fortæller jeg noget om billedet og jeg bruger ordet bogen. Pigen læser bogen. Eller også kunne jeg sige: Bogen er blå.



#### Øveopgave 1

Sig: Her er et andet billede. Nu skal du fortælle noget om billedet og bruge ordet skole. Kig på billedet og prøv på hvad du vil fortælle.

Hvis barnet beder om at få gentaget instruktionen eller siger en sætning som ikke inkluderer ordet skole eller ikke passer til billedet, så gentag instruktionen og sig: Prøv at fortælle noget om billedet og brug ordet skole.

Hvis barnet ikke svarer med andet end ja/nej i en sammenheng, det passer til billedet, så sig: Du kunne have sagt ... (sig en sætning der passer til billedet).



## Formulere sætninger

Noter barnets svar ordet. Delprøven skal ikke scores.

Demonstrationsopgave begyn \_\_\_\_\_

Øveopgave 1 sigler \_\_\_\_\_

Øveopgave 2 når \_\_\_\_\_



### 1. berømt

### 2. skole

### 3. bilen

### 4. glæmt



### 12. tredje

### 13. i stedet for



## Sætningsstruktur

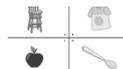
Administrer altid demonstrationsopgaven og alle øveopgaverne.

Sæt ring omkring det bogstav der svarer til barnets svar i registreringskemaet.

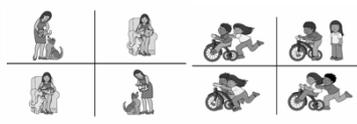
#### Demonstrationsopgave og Øveopgave 1

Sig: Se på de her billeder (peg på billederne ét ad gangen). Jeg peger på det billede som viser: Den her kan jeg have på (peg på B). Nu er det din tur. Peg på: Jeg kan spise det her (C).

Hvis barnet beder om at få gentaget instruktionen, svarer forkert eller ikke svarer inden for 10 sekunder, så gentag instruktionen. Hvis barnet fortsat ikke svarer rigtigt inden for 10 sekunder, så sig: Her er billedet som viser: Jeg kan spise det her (peg på C).



14.	A	B	1	0
	C	D		
15.	A	B	1	0
	C	D		



14. Moren viser hunden katten.

15. Pigen bliver skubbet af drengen.

## ***CELF-4 Composite Scores***

### **Core Language Score (US Model)**

- Takes only four subtests to compute and has high reliability (US: test-retest  $r = .92$ ; SEM 4.24)
- Composed of the four most discriminating subtests for each age level. Discriminates between normal and disordered performance (US: sensitivity 1.00 and specificity .89 at  $-1.5SD$ )
- Takes one third less administration time than in CELF-3 to identify a disorder and determine eligibility

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## ***CELF-4 Composite Scores***

### **Index Scores**

**Receptive Language Score:** Forståelse af instruktioner, Ligheder 1, Sætningsforståelse

**Expressive Language Score:** Grammatiske strukturer, Ligheder 2, Produktion af sætninger, Gentagelse af sætninger, Produktivt ordforråd

**Language Content Score:** Produktivt ordforråd, Ligheder 1 og 2, Sætningsforståelse, Forståelse af instruktioner

**Language Structure Score:** Grammatiske strukturer, Produktion af sætninger, Gentagelse af sætninger

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## ***CELF-4 Composite Scores***

### **Working Memory**

#### **• Talspændevide**

Number Repetition 1 (Digit Span) and Familiar Sequences 1 is from the *Children's Memory Scale* (1997) and is currently normed with CELF-4.

#### **• Kendte sekvenser**

Number Repetition 2 and Familiar Sequences 2 (Mental Control) is from the *Wechsler Memory Scale-III* (1997) and is currently normed with CELF-4.

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## ***What do the CELF-4 scores mean?***

### **Core Language Score**

- Determines if there is a language disorder
- Qualifies for services

### **Receptive Language Score**

- A measure of receptive language skills/language comprehension/listening

### **Expressive Language Score**

- A measure of primarily expressive language skills/oral expression/language expression

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## ***What do the CELF-4 scores mean?*** continued

### **Language Structure Score**

- A measure of language syntax and morphology (structure)

### **Language Content Score**

- A measure of semantics (meaning and content)

### **Language and Memory Score**

- A measure of subtests that present memory-dependent language tasks

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## ***CELF-4 Sensitivity and Specificity (US)***

- **Sensitivity** is the proportion of cases identified as disordered—when in fact they are disordered. CELF-4 sensitivity (based on standardization data) for Core Language is:
  - **100%** at  $-1.5SD$
  - **87%** at  $-2SD$
- **Specificity** is the proportion of cases identified as having normal language—when indeed they do. CELF-4 specificity (based on standardization data) is:
  - **89%** at  $-1.5SD$
  - **96%** at  $-2SD$

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## CASE STUDY 1

### Background Information

This study is of a 6 year 8 months old girl with a mild (26-40 dB) hearing impairment. She received instruction in a regular Grade 1 classroom and intervention for speech and language at the time of testing. The student was administered CELF-4 in the standard administration format during standardization.

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## Case Study 1

### Level 1. Core Language Score

Standard score 62 (+/-4 at 90%) percentile 1

### Level 2. Index Scores

- Receptive Language 92 (+/-7) percentile 30
- Expressive Language 55 (+/-5) percentile 0.1
  
- Language Content 82 (+/-5) percentile 12
- Language Structure 62 (+/-5) percentile 1

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## Case Study 1

### Level 3. Criterion/Norm Referenced Scores

- Phonological Awareness 51 (> 24)
- Word Associations 24 (> 13)
- Rapid Automatic Naming 204 (8 errors) (< 135 sec)
  
- Working Memory Index 75 (+/-9) percentile 5

### Level 4. Behavioral Ratings

- Pragmatics Profile 108 (> 125)

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## Case Study 1

### Summary

The **Core Language score** (62) places her performance within the very low educational range and supports eligibility for continuing language intervention. The **Receptive Index score** (92) falls within the average educational range, while the **Expressive Index score** (55) falls in the very low educational range, indicating a severe expressive language disorder. The **Language Content score** (82) falls within the marginal educational performance range, while the **Language Structure score** (62) is within the very low range. The **RAN time** (202 sec) is in the non-normal range, indicating a naming-speed deficit with reduced verbal automaticity and working memory for visual input. The **Working Memory Index** (75) falls in the low educational range. The **Pragmatics profile score** (108) indicates inadequacies, especially pronounced for Informing, in communication in context. This suggests a need for structured pragmatics training as part of language intervention.

### Educational Objectives

- 1.
- 2.
- 3.

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## CASE STUDY 2

### Background Information

This 7 years 6 months old boy, who was diagnosed in Kindergarten with a language disorder and received language intervention at the time of testing.

- The language disorder was first identified at age 5 years 8 months with the PLS-3. At the time of identification and determination of eligibility, his PLS-3 Total score was 67 (1<sup>st</sup> percentile). The Receptive score was 69 (2<sup>nd</sup> percentile) and the Expressive score 69 (2<sup>nd</sup> percentile).
- The student was administered CELF-4 during standardization after receiving language intervention for about 18 months.

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## Case Study 2

### Level 1. Core Language Score

Standard Score 50 (+/- 3at 90% level) percentile <0.1

### Level 2. Index Scores

- Receptive Language 92 (+/-9 at 90%) percentile 30
- Expressive Language 49 (+/-6 at 90%) percentile <0.1
  
- Language Structure 64 (+/-6 at 90%) percentile 1
- Language Content 82 (+/-7 at 90%) percentile 12

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## Case Study 2

### Level 3. Criterion/Norm Referenced Scores

- Phonological Awareness 56 (> 46)
- Word Associations 22 (> 18)
- Rapid Automatic Naming 142 sec (0 errors) (< 120 sec.)
- Working Memory Index 72 (+/-7 at 90%) 3rd%

### Level 4. Behavioral Ratings

- Pragmatics Profile 172 (> 125)

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## Case Study 2

### Summary

The **Core Language** score (50) places the performance within the very low educational range and supports his eligibility for continuing language services.

The **Receptive and Expressive Index** scores differ significantly. The **Receptive** score (92) falls within the average educational range, while the **Expressive** score (49) falls in the very low educational range, indicating a severe expressive language disorder.

The **Language Content** score (82) falls within the marginal educational performance range, while the **Language Structure** score (64) is in the very low range.

The color-form **RAN time** was 142 seconds and in the slower-than-normal range, indicating a naming-speed (working memory) deficit.

The **Working Memory Index** (72) falls in the low - very low educational range.

### Educational Objectives

- 1.
- 2.
- 3.

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## CASE STUDY 3

### Background Information

This 11 year 1 month old boy is in a Grade 5 mental retardation placement.

The student was administered WISC-III, Vineland Social Maturity Scales and CELF-4 during standardization.

On the *WISC-III* he earned a Full-Scale IQ of 59, Verbal IQ of 70, and Performance IQ of 54, indicating a significant discrepancy between verbal and performance abilities.

On the *Vineland Social Maturity Scales* his total score was 61.

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## Case Study 3

### Level 1. Core Language Score

Standard score 66 (+/-6 at 90%) percentile 1

### Level 2. Index Scores

- Receptive Language 55 (+/-8) percentile 0.1
- Expressive Language 73 (+/-7) percentile 4
- Language Content 64 (+/-7) percentile 1
- Language & Memory 64 (+/-7) percentile 1

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## Case Study 3

### Level 3. Criterion Referenced Scores

- Phonological Awareness 53 (> 67)
- Word Associations 20 (> 29)
- Rapid Automatic Naming 112 sec (0 err) (< 80)
- Working Memory Index 54 (+/-10) percentile 0.1

### Level 4. Behavioral Ratings

- Pragmatics Profile 180 (> 138)

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## Case Study 3

### Summary

The **Core Language** score (66) is in the very low educational range and supports continuing language services to establish functional communication.

The **Receptive Index** score (55) falls within the very low educational range, while the **Expressive Index** score (73) falls in the low educational range, indicating a severe receptive language disorder.

The **Language Content** score (64) falls within the very low educational performance range, as does the **Language Structure** score (64).

The student shows a 'double-deficit' with limitations in (a) phonological awareness and (b) processing speed, verbal automaticity and working memory.

The **Pragmatics Profile** ratings (180) indicated adequate communication in context.

### Educational Objectives

- 1.
- 2.
- 3.

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## *A Brain-Behavior Perspective*

### Attention & Concentration



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## CELF-4

### Brain-Behavior Perspective

Question 1. *What evidence is there of co-morbidities?*

Developmental and medical history  
Reasons for referral  
Behavioral indicators

Question 2. *What critical clinical behaviors underlie the disorder?*

Attention/hyperactivity, auditory processing, dysnomia,  
cognitive, memory deficits, etc.

Question 3. *Which neuropsychological functions are involved?*

Executive functions, visual spatial, motor, processing speed, verbal  
automaticity, etc.

Question 4. *Which neuro-psychological functions represent strengths?*

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## *Number Repetition 1 and 2*

### Diagnostic Purpose

- To evaluate working memory and the ability to repeat random digit sequences

### Sources

- Working Memory subtests from *Children's Memory Scale* (Cohen, 1997) & *Wechsler Memory Scale-III* (Wechsler, 1997)
- Renormed for CELF-4
- Part of the Working Memory Index

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## *Familiar Sequences 1 and 2*

### Diagnostic Purpose

- To evaluate the ability to sequence auditory and verbal information as quickly as possible

### Administration

- The student is asked to perform tasks including, saying counting backward from 20 and saying the alphabet while being timed.

### Sources

- Subtest from *Children's Memory Scale* (Cohen, 1997) & *Wechsler Memory Scale-III* (Wechsler, 1997)
- Renormed for CELF-4
- Part of the Working Memory Index.

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1. 20 19 18 17 16 15 14 13 12 11  
10 9 8 7 6 5 4 3 2 1

2. A B C D E F G H I J K L M N  
O P Q R S T U V W X Y Z

## *Processing-Speed Screening*

### *CELF-4 Rapid Automatic Naming*

- Assessing speed of naming single-dimensional visual stimuli (e.g., colors, shapes, numbers, letters) probes perceptual speed
- Assessing speed of naming dual-dimension visual stimuli (e.g., color-form; color-number; color-letter) probes cognitive speed (attention, working memory, verbal automaticity)

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## *Processing-Speed Screening*

### *CELF-4 Rapid Naming Measures*

- **H**ighly reliable over time
- **C**onsistent over repeated trials
- **N**ot influenced by practice or learning
- **I**ndependent of culture, language, or education
- **A**n objective measure based on clocked total-naming time
- **E**asy to administer (7-10 minutes)
- **E**asy to score and interpret (3 minutes)

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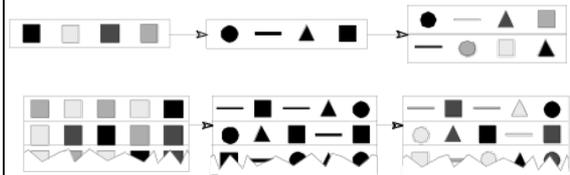
### *Processing-Speed Screening*

- Each CELF-4 RAN task consists of:  
Three untimed trial and practice items;  
Three extended naming tests with 40 visual stimuli each.  
Tests are designed to be timed and administered in a standard sequence:
- *Test 1* requires naming of repeated colors;
- *Test 2* requires naming of repeated forms, numbers, letters, animals, or objects;
- *Test 3* requires naming of combinations of colors and forms, numbers, letters, animals, or objects.

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### *Processing-Speed Screening*

#### Task A. Color-Form Naming: Trials & Tests



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### *Cognitive-Speed Screening*

- The tasks have the advantage of being “culture free,” especially appropriate where the use of a “culture free” test is desirable (e.g. use with ESL/ bilingual groups).
- Permits distinction between students with neurologically detectable involvement and those with normally functioning systems.

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### *Cognitive-Speed Screening*

- The features are important for identifying those with likely LD or AD/HD from those with similar academic underachievement in reading and spelling, but who do not have the underlying impairments associated with those conditions.
- The tests can be helpful for use in a variety of settings (e.g., alternative schools, community colleges) with populations which may be easily confused (e.g. ESL, GED).

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### *Cognitive-Speed Screening*

- Deficits in single-dimension naming (colors, shapes, numbers or letters) are considered indicative of delays or deficits in the automatization of the verbal repertoire.
- Deficits in single-dimension naming speed should be approached with intervention to establish automatization.
- There is evidence in the literature on dyslexia and rapid naming that automatization of verbal repertoires (e.g., alphabet, number sequences, multiplication tables) can be trained.

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### *A Social Perspective*

#### Affect & Mood



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## ***A Social Perspective***

**Question 1.** *Which aspects of social communication are compromised?*  
Verbal pragmatics - perspective taking  
Nonverbal communication

**Question 2.** *Which aspects of peer relations are compromised?*  
Play or game activities, friendship, interactive sharing or participating in conversations or discussions

**Question 3.** *Which aspects of student-adult relationships are compromised?*  
Respect, following directions for activities, behavioral management, mutual respect, trust etc.

**Questions 4.** *Which areas of social communication represent strengths?*

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## ***Pragmatics Profile***

### **Rituals and Conversational Skills**

The student	N	S	O	A	
1. makes/responds to greetings to/from others	1	2	3	4	NO NA
2. makes/responds to farewells to/from others	1	2	3	4	NO NA
3. begins/ends conversations (face-to-face, on phone, etc.)	1	2	3	4	NO NA

N = never, S = sometimes, O = often, A = always, NO = not observed, NA = not applicable

### **Diagnostic Purpose**

- To develop a quick profile of the student's overall pragmatic development

### **Administration**

- The examiner elicits information from someone (teacher/parent) who is familiar with the student's social behaviors and classroom interaction skills
- New to CELF-4
- Descriptive of "classroom" and "home" social communication skills
- Can be used to involve parents during assessment

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## ***An Educational Perspective***

### **Insight & Judgment**



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## ***An Educational Perspective***

**Question 1.** *Which aspects of communication in academic contexts are compromised?*

Verbal pragmatics  
Nonverbal communication

**Question 2.** *Which aspects of academic performance are compromised?*  
Listening, speaking, reading, writing, mathematics

**Question 3.** *Which curriculum objectives are compromised?*

English and language arts, social studies, natural/physical sciences, arithmetic, algebra, physical education, arts

**Questions 4.** *Which areas of performance represent strengths?*

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## ***CELF-4 Observational Rating Scale (ORS)***

- Included as a CELF-4 component
- Administration and interpretation information is included in the manual
- Rating Scale is a two-page form in pads of 50 each

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## ***CELF-4 Observational Rating Scales (ORS)***

- Contains 40 Items**
  - READING, WRITING LISTENING, AND SPEAKING
  - TEACHER, STUDENT AND PARENT FORMS
- Items Rated by Frequency of Occurrence**
  - ALWAYS, OFTEN, SOMETIMES, NEVER
- Builds Collaboration and Teamwork**
  - HIGHLY CURRICULUM-BASED AND RELEVANT

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## Test Characteristics We Look For

### Cooperation & Reliability



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## CELF-4 Validity (US)

### Validity Studies for Clinical Groups

CELF-4 clinical validity studies demonstrate

- Differences in mean scores obtained by each clinical group and a sample of normally functioning students matched for age, gender, PED, race/ethnicity, and geographic region
- Response patterns across subtests provided
- Typical response behaviors observed during administration
  - Language Disordered
  - Mild Autism
  - Hearing Impaired
  - Mentally Retarded

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## CELF-4 Validity Studies (US)

- Language disordered—Demonstrates discrimination between normal and clinical groups—sensitivity and specificity.
- CELF-4 validity study includes normal and clinical groups
- WIAT-II validity study with the reading and language portions of the Wechsler Individual Achievement Test-II
- Results of CELF-4/WISC-4 study are published in WISC-4 and are available on the CELF-4 web site and from PEARSON

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## The Question of Clinical Utility

The classic case of the thermometer

*Do you or do you not have a fever?*

The case of diabetes

*Do you or do you not have elevated levels of sugar?*

The analogy for language disorders

*Do you or do you not have a language disorder?*

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## Sensitivity and Specificity

### • Sensitivity

The percentage of children with a specific disorder correctly identified by the test measure (e.g., total scores, index or composite scores) – minimizing false negatives.

### • Specificity

The percentage of children without the specific disorders (normal) correctly identified by the test measure – minimizing false positives.

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## Sensitivity and Specificity

### • Controlling Variables

*Neurologically based behaviors* - Usually associated with high sensitivity, specificity and predictive values (e.g., 90% or larger).

*Learned behaviors* -- Usually associated with lower sensitivity, specificity and predictive values (e.g., 80-90%).

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## ***Relationships to CELF-4***

### *Core Language Score*

Represents subtests with high test-retest reliability, and internal consistency and small SEMs and 90% confidence intervals.

### *CELF-4 Core Language*

Highest sensitivity and specificity

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## ***CELF-4 Predictive Power (US)***

- **Predictive power** refers to the proportion of cases identified as disordered or not disordered in relation to:
  - (a) a population base rate (e.g., 10% for screening; 50% for matched samples)
  - (b) a preset cut score (-1SD, -1.5 SD, or -2 SD).

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## ***CELF-4 Predictive Power (US)***

- With matched samples (base rate 50%), the positive predictive power (PPP) at -1.5 SD was .90 (10 % of those classified as LLD were misclassified).
- The negative predictive power (NPP) was 1.00 (0% of those classified as non-LLD were misclassified)

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## ***Implications for the Future***

- Greater attention to clinical utility measures.
- Comparison of sensitivity and specificity in differentiating between different disorders (e.g., SLI, SLD, dyslexia, ADHD, other executive function disorders).
- Neuroimaging of mature language users to identify cortical and subcortical brain regions activated during tasks (e.g., CELF-4 Formulated Sentences, AQT color-form naming).
- Referencing neuroimaging studies that have explored cortical and subcortical brain activation on similar tasks in children and adults with specific disorders.

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