

Bridging the Achievement Gap

ALLIE'S STORY



Pearson



Allie

Reason for Referral

Allie was referred by her mother for a psycho-educational evaluation due to academic concerns regarding the development of her reading and spelling skills. Allie's mother and teachers described weaknesses in decoding skills, building a sight word vocabulary, reading accuracy and fluency, and spelling skills. This evaluation was completed for the purpose of diagnostic clarification and treatment planning.

History and Background

Allie is a 9-year-old girl who has recently completed fourth grade. She resides with her adoptive mother (referred to as "mother" in this report) who works in marketing. Allie's mother describes Allie as a happy, loving, intellectually curious, responsible, and mature child with a great sense of humor. Her teachers describe her as creative, hardworking, and compassionate. Allie enjoys horseback riding and fashion.

Socially, Allie is described as an outgoing child who makes friends easily and enjoys socializing. Behaviorally, Allie is described as cooperative at home and school. However, she requires close supervision for initiating and completing homework assignments because she tends to procrastinate. Allie is easily distracted by sounds, she requires a quiet environment to avoid auditory distractions. At school, Allie's teachers indicate that she demonstrates some anxiety when taking tests and when asked to read aloud in the classroom.

At 11 months of age, Allie was adopted from Russia. Maternal substance use during pregnancy is suspected; however, no family history information is available. Records indicate that Allie's birth weight was within normal limits, and she transitioned directly from the hospital to the orphanage. Aside from a recorded hospitalization at 6 months due to pneumonia, very little health information prior to 11 months of age is available. Allie's mother describes the orphanage caretakers as warm and caring, and indicates there was a smooth transition from the orphanage to her

home with no emotional or behavioral problems. Developmental milestones were achieved within normal limits according to Allie's mother. Medically, Allie is described as a generally healthy child. She had chronic ear infections during early toddlerhood and PE tubes at 18 months. Her vision and hearing were previously tested and found to be within normal limits.

According to her mother, Allie has excellent creative storytelling abilities and a strong oral vocabulary. She is also curious about what words mean and she doesn't hesitate to ask when unsure. In addition, Allie's mother reported that Allie has incredible attention to and memory for visual detail (e.g., patterns on clothes, color/highlights in hair, markings on a dog) and visual-spatial orientation (e.g., landmarks on a road, layout of a house) in her surroundings. Despite her reading difficulties, Allie still enjoys reading books for pleasure with her mother.

Reading difficulties were first identified in kindergarten, when Allie began receiving tutoring with a reading specialist twice per week. By third grade, she was receiving daily reading interventions from her teacher and the reading specialist. Currently, Allie attends a public elementary school in a suburban school district. She participates in a small group dyslexia intervention program at school and receives private reading instruction twice per month for three hours. The reading interventions Allie has received thus far have primarily been multi-sensory with a focus on synthetic phonics, building a sight word vocabulary,

When asked about her own reading ability, Allie said that reading is difficult for her because the words “bunch up” on the page, and she’s embarrassed when asked to read aloud in class because she reads slowly.

and improving reading fluency. When asked about her preferred school subjects, Allie said that science is her favorite class.

When asked to describe Allie’s reading difficulties, Allie’s reading specialist reported difficulties remembering sound-symbol associations, pronouncing new or unfamiliar words, oral reading rate and accuracy, and spelling. Her teacher also observed difficulties writing letters quickly, copying from the board, and using good grammar and mechanics in writing. The reading specialist said Allie’s progress has been slow and she continues to read more than one year below grade level. According to Allie’s mother, Allie guesses words based on the first few letters and transposes words within sentences. She also substitutes words to make sense with how she is reading the sentence, which often changes the meaning of the text. Allie’s mother also noted that she struggles to recognize words that she just read. As an example, when Allie read a book about Audrey Hepburn, each time she came across the name *Audrey*, she pronounced it a different way, despite being reminded each time. When asked about her own reading ability, Allie said that reading is difficult for her because the words “bunch up” on the page, and she’s embarrassed when asked to read aloud in class because she reads slowly.

Previous Evaluations

Due to parent and teacher concerns about the possibility of a learning disability, Allie was tested at school four months prior to this evaluation. Reported scores indicated superior (SS=126) intellectual functioning as measured by a brief intelligence test measuring both verbal and nonverbal cognitive abilities; average scores in phonological processing, decoding, oral reading fluency, and reading comprehension, with weaknesses in spelling and handwriting. Allie did not qualify for special education services. Subsequently, she was tested through a nonprofit agency. Reported

scores confirmed a normative weakness in spelling and, in contrast to what the school results showed, normative weaknesses in decoding fluency and oral reading fluency. *A diagnosis of reading disorder (dyslexia) was recommended.*

Vision and Hearing Screenings

Allie’s mother reported normal results from annual vision and hearing screenings. No visual or hearing problems were observed during testing.

Test Behaviors and Observations

Allie presented as a friendly and engaging child. She was well-groomed and appropriately dressed. Rapport was easily established and maintained. She initiated spontaneous conversation, maintained good eye contact while listening and speaking, and responded appropriately to social situations. She was polite and cooperative throughout the evaluation process. Her verbalizations were logical and coherent. A mild lateral lisp was noted when pronouncing /s/ sounds; however, her speech was clear and intelligible. Allie demonstrated good attention and focus during testing. Auditory distractibility was noted once during testing when a bird began pecking at a window behind her (during untimed reading comprehension). She covered her ears until the bird flew away. Generally, Allie seemed to put forth her best effort. She gave thoughtful responses and persisted during difficult tasks, but she did not persevere on items that were beyond her skill level. She seemed acutely aware of what she could and could not do, and whether her responses were right or wrong. Due to Allie’s good levels of motivation and effort during the assessment, the results of this evaluation are considered to be a valid estimate of her current functioning.

Assessment Instruments

Beery-Buktenica Developmental Test of Visual-Motor Integration, Sixth Edition
Clinical Evaluation of Language Fundamentals, Fifth Edition
Kaufman Test of Educational Achievement, Third Edition
Wechsler Intelligence Scales for Children, Fifth Edition
NEPSY:A Developmental Neuropsychological Assessment, Second Edition – selected subtests
Process Assessment of the Learner, Second Edition – selected subtests
Wechsler Individual Achievement Test, Third Edition – selected subtests

Age-based scores are reported for all instruments.

Beery™ VMI

CELF5
Clinical Evaluation of Language Fundamentals

KTEA-3

WISC-V
Wechsler Intelligence Scale for Children

NEPSY-II
NEPSY: A Developmental Neuropsychological Assessment
SECOND EDITION

pal-II
Process Assessment of the Learner
Second Edition

WIAT-III
Wechsler Individual Achievement Test
Third Edition

Test Results and Clinical Impressions

Visual-Motor Integration and Grapho-Motor Skills

Test/Subtest	Standard Score	Percentile	90% Confidence Interval
Beery VMI	86	18	74–98*
KTEA-3 Writing Fluency	79	8	67–91

* Note. Beery VMI reports 95% confidence interval.

A qualitative evaluation of Allie’s handwriting revealed adequate legibility and letter formation, but inconsistent spacing between words and weak letter positioning on the line. When asked to write the alphabet, Allie wrote all letters of the alphabet correctly except for reversing b and d. She held her pencil using an adaptive tripod grasp, and no evidence of writing fatigue was observed.

Beery VMI. Allie was asked to copy visual designs using pencil and paper. This task requires fine motor skills, perceptual discrimination skills, and the integration of perceptual and motor processes. Allie scored at the 18th percentile.

The KTEA-Writing Fluency required Allie to write as many words as possible within a five-minute time limit by writing a simple sentence for each picture presented. Scoring was based on the number of recognizable words without penalizing for spelling errors. Allie scored in the 8th percentile. She wrote about two sentences per minute.

Her performance on these measures suggests low average visual-motor integration skills and significant impairment in writing fluency.

Cognitive Processing

WISC-V Index/Subtest	Standard/Scaled Score	Percentile	90% Confidence Interval	Classification
Full Scale IQ (FSIQ)	100	50	95–105	Average
Verbal Comprehension Index (VCI) <i>Similarities</i> <i>Vocabulary</i>	100 8 12	50 25 75	94–106	Average
Visual Spatial Index (VSI) <i>Block Design</i> <i>Visual Puzzles</i>	97 8 11	42 25 63	91–104	Average
Fluid Reasoning Index (FRI) <i>Matrix Reasoning</i> <i>Figure Weights</i>	109 11 12	73 63 75	102–114	Average
Working Memory Index (WMI) <i>Digit Span</i> <i>Picture Span</i>	94 7 11	34 16 63	88–101	Average
Processing Speed Index (PSI) <i>Coding</i> <i>Symbol Search</i>	111 12 12	77 75 75	102–117	High Average
Ancillary Indexes				
General Ability Index (GAI)	101	53	96–106	Average
Cognitive Proficiency Index (CPI)	104	61	98–110	Average
Quantitative Reasoning (QRI) <i>Figure Weights</i> <i>Arithmetic</i>	103 12 9	58 75 37	98–108	Average
Auditory Working Memory (AWMI)	89	23	84–96	Low Average
Digit Span <i>Digit Span Forward</i> <i>Digit Span Backward</i> <i>Digit Span Sequencing</i>	7 6 8 9	16 9 25 37		
Letter-Number Sequencing	9	37		
Complementary Indexes				
Symbol Translation Index (STI) <i>Immediate Symbol Translation</i> <i>Delayed Symbol Translation</i> <i>Recognition Symbol Translation</i>	99 102 97 101	47 55 42 53	93–105	Average
Storage & Retrieval Index (SRI)	107	68	101–112	Average
Naming Speed Index (NSI)*	111	77	103–117	High Average

* Note. The Naming Speed Index (NSI) is discussed under the Rapid Automatic Naming section of this report.

Allie's general intellectual functioning is estimated to be in the average range (around the 50th percentile). Her scores on the GAI and FSIQ are very similar, which suggests that reducing the influence of working memory and processing speed on the estimate of overall intellectual ability results in little or no difference in her overall performance.

Allie demonstrated relative strengths on the Fluid Reasoning Index (FRI) and Processing Speed Index (PSI). The FRI includes Matrix Reasoning and Figure Weights. For Matrix Reasoning, Allie was asked to view an incomplete matrix or series and then select the response option that completes the matrix or series; she scored at the 63rd percentile. For Figure Weights, Allie was asked to view a scale with missing weight(s) and then select the response option that keeps the scale balanced. Allie needed to use the quantitative concept of equality to understand the relationship among objects and apply the concepts of matching, addition, and/or multiplication. She scored at the 75th percentile, which suggests a well-developed ability to abstract conceptual information from visual details and to effectively apply that knowledge using visual-perceptual integration. These results are consistent with Allie's strong attention to visual detail in her environment, as reported by her mother.

The PSI includes two timed subtests: Coding and Symbol Search. For Coding, Allie was asked to use a key to copy symbols that correspond with numbers; she scored at the 75th percentile. For Symbol Search, Allie was asked to scan search groups and indicate whether target symbols are present in each group. She scored at the 75th percentile. These results suggest a well-developed ability to rapidly identify visual information, make quick and accurate decisions, and rapidly implement those decisions.

The Verbal Comprehension Index (VCI) measures verbal comprehension and reasoning with two subtests: Similarities and Vocabulary. For Similarities, Allie was read two words that represent common objects or concepts, and then she was asked to describe how they are similar. She scored at the 25th percentile. For Vocabulary, Allie was asked to define words that were read aloud. She scored at the 75th percentile. Allie scored 8 points higher on Vocabulary than Similarities, which is a significant and unusual difference that occurred in only about 6 percent of the normative sample. Her performance on the VCI measures indicate good breadth of word knowledge, but a relative weakness in some aspects of verbal concept formation, cognitive flexibility, and/or associative and categorical thinking.

The Visual Spatial Index (VSI) is designed to measure the ability to analyze and synthesize abstract visual stimuli. Two subtests compose the VSI: Block Design and Visual Puzzles. For Block Design, Allie was asked to view a model and/or a picture and use two-color blocks to re-create the design under timed conditions; she scored at the 25th percentile. For Visual Puzzles,

Allie was asked to view a completed puzzle and select three response options that, when combined, reconstruct the puzzle. Visual Puzzles is designed to measure mental, non-motor construction ability, which requires visual and spatial reasoning, mental rotation, visual working memory, understanding part-whole relationships, and the ability to analyze and synthesize abstract visual stimuli; she scored at the 63rd percentile. Allie scored higher on Visual Puzzles than Block Design by three points. This score discrepancy is not significantly different; however, it suggests that visual-motor skills may be a weakness relative to overall visual-perceptual and spatial reasoning ability. This is also consistent with her relatively low score on the Beery VMI.

The Working Memory Index (WMI) measures working memory and is composed of two subtests: Digit Span and Picture Span. For Digit Span, Allie was read a sequence of numbers, and then asked to recall the numbers in the same order (Forward task), reverse order (Backward task), and ascending order (Sequencing task); she scored at the 16th percentile. For Picture Span, Allie was asked to view a stimulus

page with one or more pictures of nameable objects for a specified time and then select the picture(s) (in sequential order, if possible) from options on a response page; she scored at the 63rd percentile. Allie scored four points higher on Picture Span than Digit Span, which is a significant and unusual difference that occurred in approximately 11 percent of the normative sample. This score discrepancy may indicate that Allie can best utilize working memory in problem solving when a visual rather than oral stimulus is used, or when the mode of response requires recognition rather than free recall.

Allie's lowest index score was on the AWMJ (23rd percentile), which suggests difficulty holding and manipulating auditory verbal information in working memory in order to complete a task. Such difficulty may occur for reasons that include auditory processing difficulties, distractibility, low auditory working memory storage or manipulation. She scored higher on tasks with increased complexity (Digit Span Backward, Digit Span Sequencing, Letter-Number Sequencing) as opposed to simpler tasks that required no manipulation of information (Digit Span Forward). The process scores for Longest Digit Span Forward (LDSf), Longest Digit Span Backward (LDSb) and Longest Digit Span Sequencing (LDSs) were not particularly different. The more difficult tasks may have been more engaging for Allie, which suggests that attention and effort may have some influence on her working memory skills, but the difference was not significant.

An evaluation of index score differences revealed significant scatter between Allie's strongest and weakest index scores, but the discrepancies were not unusual compared to the normative sample. The PSI was significantly different from both the WMI (17 points lower) and the VSI (14 points lower). A 17-point discrepancy between the PSI and the WMI was observed in approximately 18 percent of the normative sample, and a 14-point discrepancy between the PSI and the VSI occurred in roughly 23 percent of the normative sample. Significant scatter was also revealed between Allie's scores on the FRI and both the WMI (15 points lower) and VSI (12 points lower), with comparable rates of scatter: a score difference of 15 points between the FRI and WMI occurs in roughly 18 percent of the normative sample and a score difference of 12 points between the FRI and VSI in about 19 percent. Since the FRI is greater than the VSI, this discrepancy suggests that Allie's ability to understand the relationship of visual information to

abstract concepts is significantly stronger than her ability to use visual and spatial information for design construction. Furthermore, Allie's FRI score, which is at the 73rd percentile, is greater than her scores on both the VCI and VSI, which are at the 50th and 42nd percentiles, respectively. This pattern of performance suggests a relative strength in Allie's ability to link visual information to semantic and quantitative constructs compared to verbal conceptual and visual spatial reasoning.

The Symbol Translation Index (STI) was not designed as a measure of intelligence, but as a measure of visual-verbal associative memory. This is a cognitive process that may interfere with academic learning, especially decoding, reading fluency, and mathematics achievement. Allie was asked to learn visual-verbal pairs and then translate symbol strings into words, phrases, or sentences. For Immediate Symbol Translation, she recalled information related to a specific visual cue. For Delayed Symbol Translation, she translated symbols using recalled visual-verbal pairs from Immediate Symbol Translation. For Recognition Symbol Translation, she viewed a symbol and selected the correct translation from response options the examiner read aloud, using recalled visual-verbal pairs from Immediate Symbol Translation. Allie scored at the 47th percentile on the STI, and scored in the average range on each of the STI subtests. These scores indicate an age-appropriate ability to encode and retrieve newly learned visual-verbal associations after short and long delays. Hence, visual-verbal associative memory does not seem to be a primary weakness that is contributing to Allie's learning difficulties.

The Storage & Retrieval Index (SRI) is based on the sum of standard scores for the Naming Speed Index (NSI) and the STI. The SRI provides a broad estimate of long-term storage and retrieval accuracy. The cognitive processes measured by the SRI are associated with reading, mathematics, and writing skills. Allie's SRI score is at the upper end of the average range, suggesting a well-developed capacity for new learning and rapid access to existing verbal knowledge stores. Therefore, long-term storage and retrieval does not seem to be a primary weakness that is contributing to Allie's learning difficulties.

Rapid Automatic Naming

Index/Subtest	Standard Score	Percentile	90% Confidence Interval
KTEA-3 Letter Naming Facility subtest	104	61	87–121
WISC–V Naming Speed Index	110	75	102–116
<i>Naming Speed Literacy subtest</i>	113	81	
<i>Naming Speed Quantity subtest</i>	106	66	

Allie performed between the 61st and 81st percentiles on subtests requiring her to rapidly name stimuli, such as letters or quantities. Allie is slow to differentiate *b* and *d* when reading and spelling, but she named other letters automatically. Naming letters requires the same kinds of rapid identification and phonological retrieval skills that are necessary for word identification. These results are consistent with Allie’s stronger performance on tests of word reading than tests of non-word reading.

Allie made no errors during the Naming Speed Literacy subtest and only one error during the Naming Speed Quantity subtest. One error on the Naming Speed Quantity subtest is fairly uncommon at Allie’s age ($\leq 10\%$), but her overall performance across the naming speed subtests indicates strong performance in this area.

Attention and Executive Functioning

Based on Allie’s reported difficulties with auditory distractibility and her performance on the WISC–V auditory working memory subtests, measures of auditory attention and executive functioning were administered to further evaluate her skills in this area.

Subtest	Scaled Score	Percentile
NEPSY-II Animal Sorting	14	91
NEPSY-II Auditory Attention and Response Set		
<i>Auditory Attention</i>	7	16
<i>Response Set</i>	8	25

Animal Sorting is an executive functioning subtest that requires conceptual reasoning skills, cognitive flexibility (set shifting), and self-monitoring. When asked to sort picture cards into categories and then shift from one concept to another, Allie scored at about the 90th percentile. Her number of correct sorts was above average. Her total number of errors fell between the 51st and 75th percentiles. These results suggest that Allie’s ability to shift cognitive set and self-monitor her own performance for accuracy is exceptionally strong.

Auditory Attention and Response Set involved listening to a series of words and then responding to a target word by touching a colored circle. This subtest has two parts. *Auditory Attention* measures selective auditory attention and the ability to sustain it (vigilance). No impulsivity was observed; however, Allie had difficulty

with this task and scored at the 16th percentile. *Response Set* measures the ability to shift and maintain a new and complex set. To perform well, Allie needed to inhibit previously learned responses and correctly respond to matching or contrasting stimuli; she scored at the 25th percentile.

Allie’s performance on these NEPSY–II subtests suggest a strong ability to shift cognitive set, especially with visual stimuli. She did less well shifting and maintaining cognitive set on an auditory task. She also had difficulty sustaining auditory attention in the midst of distracting stimuli, which is consistent with reports of auditory distractibility by Allie and her mother.

Oral Language

Composite/Subtest	Standard/Scale Score	Percentile	90% Confidence Interval
Oral Language			
KTEA-3 Oral Language composite	101	53	92–110
CELF-5 Core Language Score	89	23	84–94
CELF-5 Language Memory Index	93	32	87–99
Receptive Language			
KTEA-3 Listening Comprehension	108	70	99–117
CELF-5 Receptive Language Index	95	37	90–100
<i>Word Classes</i>	9	37	
<i>Following Directions</i>	11	63	
<i>Semantic Relationships</i>	8	25	
Expressive Language			
KTEA-3 Associational Fluency	110	75	95–125
KTEA-3 Oral Expression	85	16	75–95
CELF-5 Expressive Language Index	85	16	80–90
<i>Formulated Sentences</i>	8	25	
<i>Recalling Sentences</i>	8	25	
<i>Sentence Assembly</i>	7	16	

Listening Comprehension. When Allie was asked to listen to stories of increasing length and complexity and then answer questions about what she heard, she scored at the 70th percentile.

Tests from the CELF–5 were also administered to provide a more in-depth evaluation of Allie’s receptive language. For *Following Directions*, Allie was asked to follow a series of increasingly complex directions of 1, 2, and 3 step commands (e.g., Before pointing to the last square, point to the first circle); she scored at the 63rd percentile. For *Word Classes*, Allie was asked to select the two words that go together based on similar meaning, function, place, or time; she scored at the 37th percentile. For *Semantic Relationships*, Allie was asked to interpret sentences that make comparisons, identify location or direction, specify time relationships, include serial order, or are expressed in passive voice; she scored at the 25th percentile.

These results suggest that Allie has age-appropriate listening comprehension skills for everyday language and can follow oral directions; however, she demonstrates a relative weakness in depth of word knowledge and conceptual relationships, especially with more abstract concepts. This relative weakness is consistent with reports that Allie often confuses words and has difficulty sequencing and conceptualizing the days of the week.

Allie’s ability to shift cognitive set and self-monitor her own performance for accuracy is exceptionally strong.

Allie demonstrated a relative weakness on the WISC–V AWMI, yet she did well on listening tasks that place heavy demands on auditory verbal working memory. Allie’s performance on the NEPSY–II suggested that she has difficulty sustaining auditory attention, especially in the midst of distracting stimuli, but more challenging tasks may improve her vigilance. Taken together, these results suggest that Allie may experience difficulty listening and following directions for extended periods of time, during less interesting or challenging activities, or with competing auditory distractions.

Associational Fluency. Allie’s highest score on the KTEA–3 was on the Associational Fluency subtest, a measure of semantic verbal fluency. When asked to name as many items as possible belonging to a given semantic category within a time limit, she scored at the 75th percentile. Her strong performance on this subtest suggests well-developed verbal functioning, lexical access, and executive control processes.

Oral Expression. To assess her oral expression skills, Allie was asked to construct grammatically and syntactically correct sentences using one or more target words. She scored at the 16th percentile on the KTEA–3 Oral Expression subtest. Allie was asked to do a very similar task on the CELF–5 Formulated Sentences test; however, her responses were scored using different rules. Allie scored at the 25th percentile. Nearly all of Allie’s responses on these tests were contextually appropriate, logical, and meaningful; however, both word form and structure errors were noted. She reformulated many of her responses several times. Structure errors included some difficulty with word order (e.g., *I read books by this only author*). Word form errors included difficulty using pronouns within compound subjects, incorrect verb form, lack of parallel structure between verb tenses, and incorrect preposition. Examples of Allie’s word form errors included the following (correction is provided in parentheses):

- (a) Her grandma and her (she) were walking...; He and her (his) mom...
- (b) If he had tooken (taken) the job...
- (c) I finally throw (threw) my stuff away because I finished what I was doing.
- (d) I had an umbrella on.

Recalling Sentences. When asked Allie to listen to spoken sentences of increasing length and complexity, and repeat the sentences without changing word meaning and content, word structure, or sentence structure, she scored at the 25th percentile. Difficulties on this test may reflect underlying weaknesses in auditory working memory as well as semantic, morphological, and/or syntactic competence.

Sentence Assembly. When asked to construct grammatically acceptable and semantically meaningful sentences by manipulating given words and word groups, Allie scored at the 16th percentile. A relative weakness on this test suggests difficulty with syntactic and metalinguistic awareness.

Phonological Processing

Subtest	Standard Score	Percentile	90% Confidence Interval
KTEA-3 Phonological Processing	94	34	87–101

Allie’s overall performance on a measure of Phonological Processing was at approximately the 35th percentile. Error analysis revealed a normative weakness in segmenting. She performed well when asked to blend phonemes together to form a word, recognize and produce rhyming words, recognize words with the same beginning or ending sound, and segment words into syllables. However, she had difficulty with more advanced analytical tasks, such as deleting sounds within consonant blends or from the middle of a word and *phoneme* segmentation. Many of her errors occurred when attempting to isolate vowel sounds.

Basic Reading

Composite/Subtest	Standard Score	Percentile	90% Confidence Interval
KTEA-3 Decoding composite	80	9	77–83
<i>Nonsense Word Decoding subtest</i>	75	5	70–80
<i>Letter & Word Recognition subtest</i>	88	21	84–92

When asked to read a list of nonsense words (e.g., *charn*), Allie scored at the 5th percentile. Error analysis revealed normative weaknesses in the number of errors made in the consonant, long vowel, vowel team/diphthong, and initial/final sound categories. When asked to read a list of grade-appropriate words, Allie scored at approximately the 20th percentile. Error analysis revealed normative weaknesses in syllable insertion/omission and whole word errors in addition to the errors listed for Nonsense Word Decoding. A score difference of 13 points between these two subtests is statistically significant but not very unusual, occurring in over 15 percent of the normative sample.

When reading aloud, Allie occasionally tried to sound out unfamiliar words one sound at a time, but this was a very arduous task for her. Most often she guessed based on the initial letters/sounds of the word (e.g., sees *eleven* in isolation, says *elevator*).

Reading Comprehension

Composite/Subtest	Standard Score	Percentile	90% Confidence Interval
KTEA-3 Reading Understanding composite	87	19	82–92
<i>Reading Comprehension subtest</i>	92	30	85–99
<i>Reading Vocabulary subtest</i>	86	18	80–92

When asked to read narrative and expository passages and answer literal and inferential comprehension questions, Allie scored at the 30th percentile. Error analysis revealed normative weaknesses in all error types: literal and inferential comprehension, as well as narrative and expository passage comprehension. To assess her reading vocabulary, Allie was asked to read a sentence and find the word in the sentence that means the same thing as a target word. She scored at the 18th percentile.

A standard score difference of 16 points between Listening Comprehension and Reading Comprehension on the KTEA–3 is statistically significant but fairly common, occurring in more than 15 percent of the normative sample. Given that Allie scored in the 70th percentile on a test of listening comprehension (KTEA–3) and at the 75th percentile on a test of oral vocabulary (WISC–V), these results suggest that weaknesses in word recognition and decoding are interfering with her ability to read with understanding.

Many of Allie's errors occurred when attempting to isolate vowel sounds.

Reading Fluency

Composite/Subtest	Standard Score	Percentile	90% Confidence Interval
KTEA-3 Reading Fluency composite	83	13	76–90
<i>Word Recognition Fluency subtest</i>	84	14	73–95
<i>Decoding Fluency subtest</i>	79	8	68–90
<i>Silent Reading Fluency subtest</i>	94	34	85–103
WIAT–III Oral Reading Fluency subtest	78	7	71–85

Allie was asked to orally read a list of words (Word Recognition Fluency) and a list of nonsense words (Decoding Fluency) under timed conditions; she scored at the 14th and 8th percentiles, respectively. When asked to silently read a list of questions and respond by marking Yes or No (Silent Reading Fluency), she scored at approximately the 35th percentile.

When asked to orally read grade-appropriate passages, she scored at the 7th percentile. Most of her contextual reading miscues were orthographically similar (e.g., *who* for *how*, *police* for *pilot*, *delivering* for *developing*). She generally read for meaning and often self-corrected when the structure of the sentence was disrupted. When she saw a word/word part, even one she just read or had seen before, she struggled to activate its sound.

These results suggest that oral reading is significantly more difficult for Allie than silent reading. This is expected because oral reading requires the pronunciation of every word, whereas silent reading is more forgiving of word recognition difficulties.

Written Expression

Composite/Subtest	Standard Score	Percentile	90% Confidence Interval
KTEA-3 Expression composite	85	16	77–93
<i>Oral Expression subtest</i>	85	16	75–95
<i>Written Expression subtest</i>	90	25	81–99

Allie's written expression skills were assessed using a story booklet format in which she listened to some story elements and then wrote words and sentences to fill in the story. She was also asked to correct grammar and mechanics errors in a paragraph and write an essay retelling the story. Allie scored at the 25th percentile. Error analysis results revealed a normative weakness in the number of Structure and Word Form errors she made. Allie's performance on the Oral Expression subtest also revealed a normative weakness in Word Form errors. These results suggest weaknesses in some grammatical aspects of expressive language, both oral and written.

Spelling and Orthographic Processing

Subtest	Standard/Scaled Score	Percentile	90% Confidence Interval
KTEA-3 Spelling	84	14	81–87
PAL-II Word Choice			
<i>Accuracy</i>	12	75	
<i>Fluency</i>	12	75	
PAL-II Expressive Coding	6	9	

Spelling. When asked to spell single words from dictation, Allie scored at the 14th percentile. Some misspellings were phonetically decodable (modified examples using similar words to the test items: *crie* for *cry*; *tocen* for *token*; *techer* for *teacher*). Other misspellings had transposed letters, omitted sounds, and extra letters/sounds, resulting in words that were not phonetically decodable (modified examples: *brid* for *bird*; *colund* for *could*; *tosed* for *toasted*). An examination of Allie's recent spelling test from school also indicated a mix of phonetically decodable errors (e.g., *diffirent* for *different*; *pedel* for *pedal*) and dysphonetic errors (e.g., *pedtrein* for *pedestrian*; *invcion* for *invasion*; *signioner* for *signature*). Allie also confused high-frequency words on spelling and writing tasks (e.g., *will* for *while*) and sometimes confused homophones (*hear*/*here*). In these instances, Allie seemed to use different strategies for spelling depending on her familiarity or the regularity of the letter pattern/word.

During contextual writing tasks, her spelling errors included *b/d* confusion (*tolb* for *told*) and mostly phonetically decodable errors (*brot* for *brought*; *saff* for *safe*; *whent* for *went*). In her story about a dragon, she spelled dragon differently each time she wrote the word (*dragan*, *dragen*, *dragent*, *dager*, *daragan*).

Word Choice. To assess Allie's ability to recognize orthographic representations stored in long-term memory, she was presented with several possible spellings for a real word and then asked to recognize (circle) the correct spelling (e.g., which is the correct spelling: *phone*, *fone*, *phoan*). Each target word was

read to Allie and each of the possible spellings were phonologically accurate, so reading (and phonology) were not required. Allie correctly recognized all but one correct spelling; her scores for both accuracy and speed were at the 75th percentile. These results indicate that Allie can usually recognize the correct spelling of a word, and qualitative observations during writing tasks confirmed that she almost always knows when her own spellings are incorrect.

Expressive Coding. To evaluate Allie's ability to encode and recall orthographic representations. Allie was briefly shown letter combinations or nonsense words, and then asked to reproduce in writing part or all of what she saw. The words were not read aloud by the examiner or by Allie. She scored at the 9th percentile. A qualitative evaluation of her errors revealed good coding of the initial letter of each word. She sometimes missed final letters, but she had the most difficulty coding medial letters.

These results suggest that Allie's recognition spelling skills are quite strong, but recalling the correct spelling of a word is relatively weak. In addition, recalling letter patterns from new words is very difficult for her, especially medial letters.

Mathematics

Subtest	Standard/Scaled Score	Percentile	90% Confidence Interval
KTEA-3 Math Concepts & Applications	92	30	87–97
KTEA-3 Math Computation	95	37	88–102
KTEA-3 Math Fluency	95	37	86–104

Math Concepts & Applications. Allie’s ability to solve applied, real-world math problems was at the 30th percentile. Some of her errors resulted from confusion of terms such as before/after. Error analysis revealed normative weaknesses in subtraction, time and money, and algebra.

Math Computations. When asked to solve written math calculation problems without a time limit, Allie scored at the 37th percentile. She used her fingers to add on many of the problems. Several of her errors resulted from failing to attend to the sign, failing to regroup, or only partially regrouping. Error analysis revealed normative weaknesses in the following categories: subtraction, multiplication, division, fractions, exponents, wrong operation, and subtracting the smaller from the larger number.

Math Fluency. Allie was asked to solve as many simple addition, subtraction, multiplication, and division problems as possible in one minute; she scored at the 37th percentile. She attended to the signs correctly and did not make any errors on this subtest.

These results suggest that Allie’s math skills are within the average range when compared to her age-matched peers; however, compared to grade-matched peers, her scores were at the 19th, 21st, and 25th percentiles for the Math Concepts & Applications, Math Computation, and Math Fluency subtests, respectively. Error analysis results revealed several areas of normative weakness where Allie would benefit from supplemental instruction.

Pattern of Strengths and Weaknesses (PSW) Analysis

One component of an evaluation for a specific learning disability may include a PSW analysis, which compares an achievement weakness with areas of processing strength and weakness. If the achievement weakness is consistent with the processing weakness and both the achievement weakness and processing weakness are discrepant from the processing strength, then there may be reason to suspect a learning disability. Allie demonstrated processing strengths in the areas of processing speed (PSI=112) and fluid reasoning (FRI=109). Fluid reasoning is a more appropriate strength to use in a PSW model than processing speed because fluid reasoning is not strongly related to her achievement weaknesses in reading and writing. Auditory working memory (AWMI=89), which was Allie’s lowest processing score, is related to reading and writing achievement, but it’s not strongly related to her strength in fluid reasoning. For this reason, AWMI was used as the processing weakness in the PSW model. Allie’s primary achievement weaknesses are best represented by her KTEA–3 standard scores on the Decoding and Reading Fluency composites and the Spelling subtest. The standard score differences between Allie’s processing strength (FRI) and processing weakness (AWMI), and between her processing strength (FRI) and each of her achievement weaknesses (Decoding, Reading Fluency, Spelling) were significant ($p<.01$). The results of this analysis alone are not sufficient to identify a learning disability; however, these results taken together with her history and background, reports from her mother and teachers, and her pattern of performance across various cognitive, language, and achievement measures suggest the possibility of a learning disability in the areas of decoding, reading fluency, and spelling. In some settings, this type of learning disability is referred to as dyslexia.

Summary of Findings

Allie demonstrated strengths in many areas of functioning. Relative cognitive processing strengths include processing speed, naming speed, fluid reasoning (visual-spatial reasoning and attention to visual detail), visual nonverbal working memory, cognitive flexibility, and self-monitoring. Relative oral language strengths include semantic verbal fluency, oral vocabulary (breadth of word knowledge), and comprehension skills.

Relative processing weaknesses include auditory working memory, difficulty sustaining auditory attention in the midst of distracting stimuli, phonemic analysis and segmentation skills, and orthographic coding. These processing weaknesses may contribute to her difficulties in decoding, reading fluency, spelling, and specific areas of math computation and math problem solving. In addition, Allie demonstrated a weakness in visual-motor integration; her writing speed was slow and her handwriting revealed inconsistent spacing between words and weak letter positioning on the line.

Allie's depth of word knowledge and understanding of conceptual relationships were relatively weak and likely contribute to her difficulties sequencing and conceptualizing the days of the week and using the appropriate label for concepts such as hot/cold. Relative weaknesses in morphological, syntactic, and metalinguistic awareness were also demonstrated.

Recommendations

On the basis of these findings, the following recommendations are made for improving Allie's academic performance:

General Approach

Provide maximally effective instruction that follows a cycle of test-teach-retest. Before teaching a particular skill, assess what Allie already knows and needs to be taught; plan targeted instruction that begins with what she knows and works toward the unknown; assess whether the instruction was effective; and modify accordingly.

Teach concepts and skills explicitly and systematically, and allow discovery to be a part of instruction. Explicit teaching brings knowledge into conscious awareness, but not necessarily via direct instruction. Use materials that explicitly highlight the rule or pattern that Allie needs to learn (e.g., vary words by one feature and hold other things constant, such as changing the initial phoneme or the morpheme being taught). Ask Allie to find patterns within a list of words, find the ones that are similar or the one that is different, and then teach the pattern explicitly. A discovery approach will build upon Allie's curiosity about words and her strong problem solving abilities and it will also keep her engaged in the instruction.

Study groups of words with similar patterns, rather than using graded word lists that do not share similar features.

Utilize and build upon Allie's strong oral vocabulary, intellectual curiosity, and attention to visual detail when addressing her areas of weakness. Select a wide variety of texts that cover many different subject areas. Encourage reading for different purposes, such as learning, entertainment, and communication with others. Plan writing assignments with a variety of different purposes and audiences in mind. Incorporate visual nonverbal stimuli into instruction, such as writing descriptive essays about pictures, settings, or experiences and tracking her progress on simple line graphs or charts.

Presenting information visually as opposed to aurally may improve Allie's working memory functioning; however, tasks requiring visual-motor integration may be challenging. Consider shortening the amount of spoken information given at one time and supplement aural information with visual reminders.

Minimize distractions during learning activities. Consider preferential seating arrangements away from auditory distractions (e.g., doors opening and closing, air conditioning units).

Allie is likely to become less attentive during tasks that are lengthy, repetitive, or uninteresting to her. To avoid habituation, vary the nature and length of instructional activities to continually redirect Allie to new tasks. Ensure that tasks are at an appropriate level of difficulty to be sufficiently engaging.

Phonemic Analysis

Strengthen Allie's phonemic analysis skills. Practice with (oral) word games that require her to segment words by phoneme, delete phonemes from words, and replace syllables/phonemes to change a word. These skills can also be incorporated into phonics instruction with activities that involve manipulating letter cards to form words (e.g., reading a word and then changing/deleting/adding a letter/letter pattern to form a different word).

Basic Reading

Weave reading, spelling, and vocabulary instruction together, so each one builds upon the other. Maintain a focus on comprehension and meaning when reading and spelling new words. Also incorporate phonological, orthographic, morphological, syntactic, and pragmatic layers of word knowledge.

To improve her visual inspection of words (orthographic coding), ask Allie to find a target word among orthographically similar words (e.g., pedestrian: *pedstrian, pedestrian, pedestrien, pedestrin*). This can also be done under timed conditions to track speed of visual processing. Include distractors with misspellings in the medial and final letter positions, where Allie makes most of her reading errors.

Teach strategies for decoding, emphasizing syllabication and morphological analysis. Teach Allie to visually chunk words into morphemes. Read words that are visually separated by syllable (e.g., *pre view*). Provide her with

practice reading from flip booklets that expose the prefix or suffix, and then change the root of the word to form new words. Ask Allie to read and spell derived words from the same family (e.g., *cooperate, cooperative, uncooperative, cooperation*). Cut word cards in order to physically separate prefixes or suffixes from the root word. After cutting the cards, mix them up and ask Allie to find the right cards to spell a specific word. Teach the meaning of each prefix and root as part of the word study (e.g., *-an* signifies a person: *physician, librarian, pedestrian*, etc.).

Spelling

Be careful not to over-rely on spelling accommodations. Accommodations for spelling weaknesses are seldom sufficient and they are not recommended as a substitute for instruction. For example, spell checkers are only useful for self-monitoring typos if the user can recognize the correct spelling; spell checkers do not help poor spellers generate correct spellings. Additionally, spell checkers cannot consistently identify when a word is misspelled if it is the correct spelling of a different word.

Teach explicit spelling rules and patterns and the exceptions to those rules, but still allow for discovery. Let Allie discover patterns and rules through word sorting and carefully controlled materials. Examples of patterns to teach via discovery include when to use different spellings of the same sound: *ou* or *ow* to spell the /ow/ sound, *tch* or *ch* to spell the final /ch/ sound, *dge* or *ge* to spell the final /j/ sound.



Teach the following strategies for spelling:

Generate alternatives. Allie can recognize the correct spelling of a word, so teach her to generate alternative spellings and then select the correct one. In order for her to produce good alternatives, teach Allie the different orthographic patterns that are used for representing sounds.

Spell by analogy. Provide practice generating possible spellings of the same sound or rime and then identifying the correct one (e.g., *lait* vs. *late*).

Syllabication. Teach Allie the six syllable types and how to spell multisyllabic words one syllable at a time, remembering that every syllable needs a vowel (with a few exceptions). Color-code different word parts to assist with awareness of patterns. Building upon her study of morphological analysis, encourage her to spell derived words in parts (e.g., spell the root first, and then add affixes: take ... *mis- take*).

Teach strategies for spelling exception words, including using mnemonics (e.g., build: *u* and *i* will build a house; separate: there's a *rat* in separate), saying the word as it sounds (e.g., Wed-nes-day), and visualizing the word. Teach Allie to look carefully at the word she's learning to spell, noticing the parts of the word that are tricky as she says the word. Then Allie would cover up the word, and write the word while saying it aloud. Finally, Allie would uncover the word and check her spelling.

Bridging the Achievement Gap



Reading Fluency

Instruction should aim to improve Allie's reading speed and accuracy at the level of the word, phrase, sentence, and paragraph. Provide Allie with practice reading phrase cards with the goal of improving how quickly she can read them all accurately. Each card should have a phrase, such as "jumping over her fence" or "walked across the street." Also practice reading sentences that contain those phrases (e.g., "The dogs jumped on the chair") and vary the sentences (e.g., "The dogs are jumping on the chair" and "The dog jumps on a chair").

When reading connected text, Allie needs to pay greater attention to period breaks to prevent sentences from running into each other. The neurological impress method (Allie and the teacher read aloud simultaneously), echo reading (teacher reads sentence/s aloud and then Allie reads the same sentence/s aloud), and repeated reading are recommended.

Reading Comprehension

Allie's language comprehension skills are generally strong, but weaknesses in word recognition and decoding sometimes interfere with her reading comprehension. Instruction should help Allie monitor her own reading comprehension and teach strategies for resolving comprehension problems and determining the meaning of unknown words. Incorporate silent reading activities as well; for example, she might be asked to silently read three sentences and choose the one that makes sense or uses a target word correctly.

Written Expression

Provide grammar instruction that improves communication ability in both oral and written language by incorporating listening, speaking, reading, and writing activities. Provide tasks that require both receptive (e.g., which one is correct?) and expressive (e.g., say/write a sentence using this word) modes of response.

Address low-level skills during the revision stage. Grammar, spelling, and letter formation issues should not be explicitly corrected or taught during prewriting, planning, and composing; save this work for revision. Teach Allie to look specifically for the types of errors that she tends to make and that relate to grammar and mechanics skills that have been taught. Provide a checklist, mnemonic, or other reminder of what to look for.

Handwriting and Writing Fluency

Eliminate *b/d* confusion. Correct letter formation is critical to distinguish these letters. When forming the letter *b*, start with the stick first, followed by the circle. It may be helpful to refer to them as a bat and a ball, always in that order (first you grab the bat, then you hit the ball). When reading, teach Allie that if she sees the bat first, then it's a *b* (say to yourself, bat-ball, *b*). Once Allie can recognize and write *b* without confusion, then teach *d*. When forming the letter *d*, do the reverse; start with the circle first, then the stick (first you grab the doorknob, then you open the door). When reading, teach Allie that if she sees the doorknob first, then it's a *d* (say to yourself, doorknob, door, *d*).

Teach Allie keyboarding skills and typing by touch (without looking at keys), but be careful not to over-rely on keyboarding as an accommodation. For example, use keyboarding when Allie is writing papers to demonstrate learning in a subject area, such as science and social studies.

Encourage writing by hand to improve writing fluency. Emphasize legibility and good form, not necessarily perfect penmanship. Reinforce the goal of writing as effective communication. Consider whether modified writing tools, such as a triangle pencil or pencil grip, or writing on a slightly inclined surface may be helpful. Allow extra time on writing tests and assignments, if needed.

Provide opportunities for Allie to draw, copy designs, and trace pictures to improve her visual-motor integration skills. Select materials that are of interest to Allie (e.g., animals, fashion designs, etc.).

Semantics, Morphology, and Syntax

Strengthen Allie's depth of word knowledge and conceptual understanding of concepts such as hot/cold. Provide Allie with a series of sentences that require her to fill in the blank with synonyms, antonyms, and related words. Provide a word bank that expands on the target concept; for example, to strengthen her concept of hot, include words such as heated, warm, humid, tepid, toasty, warmed, red-hot, scalding hot, and lukewarm. Encourage Allie to use each of the words in a sentence. Teach idiomatic usages and definitions, such as hot tempered, hot head, hot streak, and hot commodity.

Evaluate Allie's knowledge of words on a scale from unknown to acquainted to highly familiar. Teaching different components of a word's meaning and how meaning changes in different contexts will help establish highly familiar word knowledge. Teach words with multiple meanings and nuances and the ways in which a word's meaning changes in different contexts. Teach the meaning and use of compound words, synonyms-antonyms, homonyms, idioms, and the semantic relationships between words. Tasks might include sorting words into different semantic categories (e.g., positive, negative, neutral) and linguistic categories (e.g., adjectives, nouns). Teach word meaning, word structure, and grammatical usage in context using both reading and listening tasks.

To help her conceptualize and sequence the days of the week, create word cards that embed images into each word that relate to that day of the week. For example, the word Saturday has the word "sat" in it, so it might include someone sitting and relaxing. The word Sunday might have a picture of a sun rising, indicating the beginning of a new week. Allie should help create these images to make them personalized to what she typically does each day. Incorporate these words into reading and writing activities. Every week, Allie might write about something she did on each day of the week. Provide statements for her to read, such as "I go to school on Saturday" and "Wednesday is the day after Monday" and circle the statements that are true.

Use songs and rhymes to help her sequence the days of the week (such as singing the days of the week to the tune of a familiar song).

To strengthen grammatical aspects of expressive language, provide instruction that supports compound and complex sentence production in both the oral and written modalities. Practice expanding simple sentences and also combining two or three sentences into one. To build syntactic awareness, consider presenting Allie with a cloze sentence or pair of sentences, and ask her to say or write a word to fill in each blank. The sentences should contain minimal semantic information, such as "My dog has a _____. She is _____ it."

Mathematics

Strengthen Allie's math skills and monitor her skill development carefully. Provide explicit, systematic instruction, especially in the areas of algebra, fractions, and time and money. Explicitly teach the vocabulary and language that is used during math instruction (as well as in science and other subject areas).

Teach Allie to tell time on an analog clock. Consider beginning with a simplified clock that only shows the hour hand to teach Allie to estimate time to the nearest hour (e.g., almost 2 o'clock, a little after 2, 3 o'clock). Then teach Allie to tell time to the near hour on a two-handed clock, focusing on the hour hand; she can cover the minute hand, if necessary. Ensure that Allie can perceive the difference between the hour and minute hand; use a different color for each hand, if needed. Use a geared clock to demonstrate how the minute hand moves all the way around in order for the hour hand to move ahead one hour. Finally, use a spinner clock to visually teach the minutes, and practice skip-counting by 5s around the clock. Teach the language of time explicitly such as "half past, 10 minutes ago, 10 minutes after 3, 10 of 3."

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