

Reading Comprehension Struggles and Successes: Case Study of a Leading Scientist

By Rosalie Fink

How does a child with severe reading difficulties learn to read and succeed in a field that demands comprehension of huge amounts of complex text? The odyssey of Ronald W. Davis, who was a failing student yet became a member of the National Academy of Sciences, provides inspiring insight to this question. Despite severe struggles learning to read, Dr. Davis has made enormous contributions to modern genomics and molecular biology. He is a scientific leader yet has pronounced gaps in certain aspects of basic reading, writing, and spelling. How did he learn to read? How does he read today? And, what can classroom teachers and reading specialists learn from Davis' story? This case study sheds light on these questions.

Who is Ron Davis?

Ronald W. Davis is Professor of Biochemistry and Genetics at Stanford University Medical School. His new genetic techniques are used all over the world for research on devastating genetic diseases, including cystic fibrosis, Huntington's disease, and muscular dystrophy. When a couple goes for a prenatal diagnosis, the physician gives information based on Davis' discoveries. Dr. Davis has published over 175 scientific articles and a classic genetics text (Davis, Botstein, and Roth, 1980). He is a sought-after speaker, a member of the National Academy of Sciences, and the winner of prestigious scientific awards.

Disparate Abilities

Despite his superb abilities as a scientist, Ron Davis still has difficulty with some very basic, low-level literacy skills. Such disparities in cognitive abilities have fascinated researchers interested in understanding how different abilities develop to different extents within the same individual (Fink, in press a, in press b, 2002, 2000a, 2000b, 1998a, 1998b, 1998c, 1995/96, 1993, 1992; Fischer and Biddell, 1997; Piaget, 1952). Nowhere is the theme of disparate abilities more evident than in Ron Davis' case. I was intrigued to learn how Ron's disparate abilities in science, literacy, and other domains had



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developed. So I analyzed his history of reading and writing difficulties based on a series of face-to-face interviews, using Carol Gilligan's clinical interview methodology (See Figure 1: Learning Interview Schedule developed by Rosalie P. Fink). Using Gilligan's approach, the interviewing researcher not only follows her own research agenda with prepared questions, but also the agenda, needs, questions, and linguistic patterns of the interviewee. I audiotaped and transcribed Ron Davis' interviews in their entirety and, to check for reliability, interviews were coded and analyzed by two independent psychologists trained at the Harvard Graduate School of Education in Gilligan's methodology. In addition to interviewing, I also administered several formal and informal reading assessments (See Figure 2: Tests and Assessments).

Results revealed dramatic discrepancies between Ron's intellectual strengths and weaknesses. Ron showed evidence of all the signature characteristics of dyslexia --- unexpected difficulties learning to read, spell, and write --- and other problems that often accompany dyslexia, including difficulties with single word decoding and word recognition, letter identification, a discrepancy between his cognitive ability and reading ability, slow speed in reading and writing, word retrieval problems, laterality problems (difficulty making left-right distinctions), diagnosis and remediation for reading problems, familial dyslexia, and difficulties with second language learning and fine motor control (See Fink, 1992, 1995/96, 1998a, 2000a, 2002)1. I administered the

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Adult Reading History Questionnaire (ARHQ) to assess the severity of Ron's dyslexia on an independent instrument (Lefly and Pennington, in review). Ron's ARHQ quotient was .69, indicating that his difficulties with reading were severe.

Low Reading and Spelling from the Get-go

Ron's formative years did not augur well for a stellar career in science. His extraordinary difficulties in learning to read were evident as early as age 6.

I was at the bottom in reading skills and spelling skills. I was a very, very slow reader and couldn't read out loud or silently. It began in first grade and continued in second grade, third grade, and on and on and on....

Ron repeated the first grade in a public school in rural Indiana, where he struggled with reading continuously despite receiving tutorial help from student teachers at a neighboring university. Finally, when he was about 11, he developed basic fluency, or relative smoothness in reading familiar texts. So he "learned to read" at a basic level 3 to 4 years later than "normally developing" peers (Chall, 1983/1996; Snow, Burns, and Griffin, 1998). However, Ron continued to have difficulties identifying letters of the alphabet and their corresponding sounds. To this day he has trouble distinguishing between look-alike letters, such as *b*, *d*, *p*, *q*, *m*, and *n*, and compensates by printing in upper case letters to reduce his errors.

Actually, I still print today. I print everything in capitals to help with letters like "B" and "D."

Reading and Thinking about Science

I asked Ron to reflect on his earliest experiences with science and with reading. I expected to find that Ron had conducted science experiments without really reading much, because I assumed that continual frustration with basic skills might have led him to avoid reading. However, I soon discovered (to my surprise) that Ron was an avid reader when it came to science materials. He sought out books on science despite his problems with lower level literacy skills. And, beginning at an early age he actually found reading about science pleasurable.

You'd start reading a lot. Because you like it. (Grade 3 and up)

As Ron spoke, his voice revealed that of an avid young reader propelled by a passionate interest: Science.

You read science for -- how things are put together. My interest in chemistry just came from -- it started with my interest in airplanes in grade school...that quickly converted to propellant systems in 7th and 8th grades.

Reading teachers know that interest in a topic is a key factor that impels children forward in reading skill development (Fink, 1995/96, 1998a, 1998b, 2000a; Lindquist, 1988; Worthy, Moorman, and Turner, 1999). In Ron's case, he was propelled by intense interest in science and what Ellen Winner (1995) calls a "rage to master" a subject. So Ron read advanced science books and journals despite his severe difficulties with visual and phonological skills. And, despite his problems, he engaged in very sophisticated scientific reading and thinking, apparently above the level of his peers.

When I was a freshman in high school I read quite a few college texts. I became fascinated with nitrogen chemistry, so I got organic chemistry textbooks. Sputnik went up in 1957; I was a sophomore in high school then, but I knew it was going up before then 'cause I read all the journals, various aeronautic journals.

Ron's scientific reading was spurred by an abiding fascination with science, a veritable love for everything connected with the subject. Although Western culture historically separates thought from feeling, recent research has established a firm linkage between cognition and emotion (Csikszentmihalyi, 1991; Fischer and Bidell, 1997). In Ron's case, feeling and thinking about science were apparently inseparable. Ron's reading about science became what Csikszentmihalyi (1991) calls "a flow experience," the feeling of being carried away by a current. In common parlance we call this "getting lost in a good book," in which case the reader is so completely involved and transformed by the reading material that he loses awareness of all else around and may not notice a parent's call to dinner (despite the fact that the parent is standing in the same room).

When concentration is based on enjoyment and interest this intense, the result may be a liberating, flow-like loss of self-consciousness. For a struggling reader such as Ron, who ordinarily has difficulty reading and consequently may become anxious in

some reading situations, such a flow-like experience while reading highly interesting materials can be especially significant. In Ron's case it was.

Mentors and Sociocultural Support for Science

Ron immersed himself in scientific reading at a moment in history when American culture placed a high value on disseminating scientific information and attracting young people into science. He vividly recalled the cultural atmosphere of his school days in the 1950s, when Americans wanted to "catch up with the Russians".

After the Russians sent up Sputnik in a rocket, it became much easier to go into science. As a result of Sputnik, vans came around to public schools and parks with lots of library books about science -- advanced books, including some very technical books on engineering and calculus. So I borrowed very technical books and read them.

Key teachers supported Ron's scientific reading interests, supplying him with advanced science texts and connecting him with upper level science mentors.

In grade school, I had contact with a high school chemistry teacher who got me a high school chemistry textbook to read. ...When I was a junior in high school, my biology teacher encouraged me to do research projects and take harder science classes. He got me science books to read and put me in contact with a biology professor at Eastern Illinois University.

Comprehension Scaffolds: Context and the Schema of Science

How was Ron able to comprehend highly technical engineering and calculus books despite his continuing problems with lower level reading skills? The answer is that, through avid reading of science texts, he developed familiarity with the schema of science and relied to a great extent on context clues.

I guessed what made sense when I didn't know a word. And I usually got it right.

We know that context-reliant reading is effective and accurate when the reader possesses sufficient background knowledge and has internalized the schema (vocabulary and concepts) of the particular type of material (Anderson, 1983; Rumelhart, 1980).

For Ron, context clues were relatively reliable due to his familiarity with the schema of science. But how did Ron's reading become accurate? Spurred by his hunger for scientific information, Ron read science

materials voraciously, reading everything about science that he could find. He became a virtual "little expert" in scientific vocabulary, concepts, themes, questions, and typical text structures. This schema familiarity and Ron's increasing wealth of background information provided the scaffolds that supported his eventual development of optimal scientific reading skills.

In Stanovich's terms (1986), Ron got richer, or better at reading, as a result of extensive practice. He read science avidly and used the repetition inherent in narrow, discipline-specific science texts to promote his skill development. The redundant scientific material itself provided the requisite drill and practice that enhanced Ron's reading development to optimal levels. The high interest value of his chosen scientific reading increased the amount of reading in which he engaged. And, the sheer volume of reading provided him with greater practice of skills. Thus Ron's familiarity with scientific schema aided his accuracy of comprehension of scientific material and supported his ability to read increasingly complex materials at higher and higher levels (Fink, 1992; 1993; 1995/1996; 1998a, 2000).

Ron's Complex "Intelligence"

Ron's fascination with science drove him at an early age to "do science" far beyond the level of his classmates. But despite his interest and ability in science, Ron had a hard time in school and suffered continuing humiliations due to his ongoing problems with reading, spelling, and writing. Some of his teachers were blind to his abilities and saw only deficits. Ron was aware of their negative assessment:

Teachers assumed I was not too bright.

On traditional intelligence tests, Ron scored in the low average range in elementary school, middle school, and high school. In the eighth grade, he scored 90 on a timed group intelligence test that required reading. This placed him in an intelligence category considered "low normal". Unfortunately for Ron, unitary notions of intelligence prevailed at the time. Intelligence was commonly conceptualized as a single trait, one that individuals either possessed or lacked. (Either you were smart or you weren't. Period). More complex, dynamic notions of intelligence were still in the future --- notions such as Howard Gardner's theory of multiple intelligences, a concept that allows for the co-existence of different

types of "intelligences" at different levels within the same person (Gardner, 1983).

"Forget Algebra; Major in Shop"

Ron's middle school guidance counselor perceived IQ as a unitary, general measure of intellectual ability across subjects. He thought Ron was a slow learner incapable of all abstract reasoning regardless of the subject.

With an IQ of 90, you'll never pass elementary algebra. I forbid you to take it. Take shop instead. Forget algebra. Major in shop.

Ron's father was a carpenter and would have been happy to have his son major in shop --- just like dad. Both of Ron's parents were loving but had only completed the eighth grade, so they didn't have the background to recognize their son's scientific abilities. But Ron's intellectual curiosity and interest drove him forward despite the obstacles he faced. He would take algebra no matter what.

I'm going to go and take the class...and I don't care if you don't want me to take it'. We argued for a long time; then he said, 'Okay, go and take it, and when you flunk out, I'm going to tell you I told you so'.

Ron knew that elementary algebra was a requirement for college admission, and he wanted to go to college so that he could become a scientist, so he borrowed an elementary algebra textbook. During the summer, he read the algebra text slowly and haltingly in a manner typical of many individuals with dyslexia. And, reading the book at his own slow pace, he gradually mastered the algebra concepts and made the guidance counselor eat his words.

Then I got a 95 and was the top student in the class. But I knew that I would do that because I already knew algebra from reading the book.

Excelling in Math

What led Ron to disregard the dire premonitions of his guidance counselor, who told him that algebra was too hard, that he would surely fail? Key to Ron's success was his self-confidence and an astute observation: early on he had noticed a great disparity between his capabilities and the assessments of people in authority. He knew from his own experience that he was good in math.

In grade school I could estimate in math better than other kids. I could do approximations instantly. It gave me confidence in myself --- even though I still had trouble with reading. I could realize that I could do math and people would tell me that I couldn't do it. Now that immediately questioned their credibility. ...That makes a turning point. You begin to question their wisdom and... trust yourself more.

As Ron was learning to trust himself, many teachers focused narrowly on his problems with basic reading, writing, and spelling. His English teachers and guidance counselor concluded that Ron was not "college material," refusing to write him recommendations.

English teachers:

"There's no way you're gonna get through college; the requirements for English are far too stiff. Your IQ's just not high enough.'...All my English teachers always told me, 'You cannot go to college; your English is far too poor. You cannot write. You cannot spell.'¹

Guidance counselor:

You can't be a chemist; you don't even qualify to be a chemist's assistant washing dishes. Your aptitude is not high enough even for that. You can't even talk to a chemist. I'm not going to waste my time writing you recommendations for college.

Ron responded, "If you won't help me, then I'll apply to college myself," which he did. Confronted with the daunting prospect of facing the college admission process alone, Ron demonstrated the same kind of gritty persistence reported in studies of successful men and women with dyslexia and other learning disabilities (Fink, 1998a, 2000b; Gerber and Reiff, 1992). So he applied to a community college (where recommendations were not required), gained acceptance, and after attending for a few semesters, transferred to a four year university, where he earned straight A's in all of his science courses and graduated from college.

Comprehension in High Interest versus "Non-interest" Subjects

Ron's record of straight A's in science reflects his apparent proficiency in scientific literacy. His reading habits, scientific writing, and formal and informal reading assessments suggest that he

developed proficiency reading highly complex scientific materials of interest to him. Yet, his reading skills apparently remained rudimentary in "non-interest" subjects. And, throughout his schooling Ron's grades suggest that he just squeaked by in "non-interest" subjects such as English and history.

I could never do English. In high school English teachers passed me, even though I failed tests.

In "non-interest" subjects, Ron read a bare minimum, at most reading only what was required. Sometimes he read even less. Therefore, he lacked sufficient background information to use the contextual schemata of English and history as effectively as he did with science. So he had to use other strategies for reading and studying English and history. For these "non-interest" subjects, Ron used visualization and retelling strategies to help him read, comprehend, and remember material. He looked away from the print, created stories about history, and visualized the action happening.

I didn't do very well in history, but I passed. I always tried to make a story out of it by visualizing it actually happening. I looked away and visualized a sign with a number on it for the date. I just visualized events happening. People called it 'daydreaming.' I was constantly accused of daydreaming all through school.

Ron visualized scenes of war battles occurring in front of his very eyes. In his mind's eye, he "saw" a sign with the date of a significant battle. Visualization was a strategy that helped him get by in his "non-interest" subjects.

Ron's reading abilities fluctuated, depending on the subject matter. When the reading task and context related to math or science, his motivation was high and he worked hard.

I spent a lot of effort on reading math and science.

However, when the reading task and context involved novels or history texts, Ron's interest and motivation plummeted. He read very little in these "non-interest" areas.

I didn't do most of the reading for English; I read the comic book instead!

Since he avoided most assigned reading for English, he got less practice and fell further behind peers in

comprehending complex literature. Ron's avoidance of literature and resulting lack of familiarity with literary genres, in turn, apparently influenced his low English test scores. His grades were consistently lower in English and social studies (Cs, Bs, and F) compared to math and science (straight As), all the way from grade school through college.

I always got A's in math. And science, too, beginning in grade school. In college I took all the science courses they offered and got straight A's. I got one F in college...I got an F in English. ...So I researched all the English comp. teachers and figured one who would give me a passing grade, given my spelling abilities.

Ron passed English composition the second time around by engaging in what Gerber and Reiff (1992) call "reframing" the problem. He acknowledged the challenge he faced with English and engaged in problem-solving based on his abilities, thereby creating a positive solution.

The Graduate Record Exam, Cal. Tech., and the French Connection

After graduating from college, Ron's goal was to attend graduate school and become a scientist. He applied to doctoral programs, which required taking The Graduate Record Examination (GRE), consisting of various subtests. Each subtest contains timed reading selections and accompanying reading comprehension questions. Even the chemistry test entails reading connected text and answering reading comprehension questions; it is not merely a matter of reading chemical formulae. Ron's scores on The GRE show an enormous discrepancy among subtests, especially between chemistry, (he scored in the highest 99.9th percentile nationally) and English, (he scored in the lowest 16th percentile nationally).

Based on his outstanding chemistry score, Ron was admitted to the doctoral program in chemistry at the California Institute of Technology, where he immediately excelled in science courses and experimental laboratory work. However, his language weaknesses continued to plague him. He was required to pass a foreign language proficiency test, so he took a course designed to prepare doctoral students for the French test. Despite taking the course several times, he repeatedly failed the French test. He took it over and over to no avail. And there were serious consequences.

They cut my scholarship and ... told me not to come to the lab

anymore --- to stay home and study for the French test. Then they told me I was going to flunk out, that they would kick me out of graduate school if I didn't pass the language requirement.

So Ron stayed home, studied French, and took the French exam yet again --- but to no avail. He failed the test again. However, Ron's thesis advisor recognized his strong ability as an experimentalist. So he went to bat for him, advocating for special accommodations on the French exam (before accommodations were required by law).

Davidson went to bat for me and convinced the Graduate School Committee that I was an unusual circumstance, that I was a good experimentalist who couldn't pass the French test. He convinced them to let me do a translation project instead of the test. And they let me use a dictionary for the translation.

Like others with dyslexia, Ron could not read French sufficiently accurately without the aid of a French-English dictionary, but with it he passed the foreign language requirement and moved on.

They sent me a letter that said, 'The Graduate Committee accepted your translation. Congratulations.' It was the happiest day of my life! I owe it to Norman Davidson.

Without Davidson's mentoring and advocacy, Ron Davis would have flunked out of the doctoral program at Cal. Tech.; his dream of becoming a scientist would have been shattered. And, we would not have benefited from his genetic discoveries --- discoveries that have contributed significantly to major advances in modern medicine.

Ron's Complex Reading Profile

Ron ultimately developed the salient characteristics of the highest level of reading development, stage 5 (Chall, 1983/1996). As a stage 5 reader, he not only reads and comprehends materials that are highly difficult, specialized, technical, and abstract, but also writes complex materials, as his impressive prolific publications attest. Ron integrates and synthesizes knowledge from other experts with his own knowledge, and creates new knowledge in his field.

As an adult today, he demonstrates all of the salient characteristics of stage 5 reading ability except for speed and efficiency, which he still lacks. Ron's performance on formal and informal individualized reading assessments shows a complex profile of strengths and weaknesses. On vocabulary

and silent reading comprehension --- the higher level "meaning-making" skills --- he performs at the highest possible levels, both on the Nelson-Denny Reading Test (ND) and the Diagnostic Assessments of Reading (DAR), which has a ceiling of 12th grade level. On the ND, Ron's vocabulary is at grade 17.1, which is graduate school level. In silent reading comprehension on the ND, he performs at grade 16.9, which is advanced college level. Despite his high achievement in these higher level skills, however, his performance on the DAR reveals dramatically lower levels in what Chall called basic, lower level "print" skills. These include word recognition out of context, word analysis, spelling, and oral reading. On these subskills on the DAR, Ron performs at middle school levels (See Figure 3: DAR Interpretive Profile). His spelling is at 6th grade level, and his oral reading of words out of context is at 8th grade level.

Furthermore, Ron's specific errors on the DAR were emblematic of his ongoing struggles with lower level skills. He misread "sit" for "set" and made errors on consonant sounds, consonant blends, and short vowel sounds (See Figure 3: DAR Interpretive Profile). He had difficulty identifying the letters "b" and "d" and was slow to determine whether words such as "horse" and "house" or "chicken" and "children" were the same or different. He commented, "I had to look at them and read them twice before I knew".

Ron's problems with identifying letters and words and his problems with phonological decoding skills slow him down. He moves his lips while reading silently, the way children do while first learning to read. His reading rate is slow, as shown by his slow speed on the ND, Scaled Score = 181. (A "normal" adult reader's rate is SS=200 or above). Ron's slow reading is indicative of his poor integration of visual, phonological, and meaning-making skills. His uneven reading profile is congruent with a pattern found in adults with learning disabilities at the Harvard Adult Literacy Center, who were relatively stronger in vocabulary and silent reading comprehension (higher level, "meaning-making" skills) and weaker in the lower level "print" aspects of reading (basic skills such as word recognition, word analysis, spelling, and oral reading) (Chall, 1994, p. 30). Despite Ron's continuing problems with these low level skills, his overall functioning as a reader is high. He comprehends and writes at stage 5, the highest level possible. His long list of scholarly publications and his book on genetic techniques attest to his overall

high achievement in what ultimately matters most in literacy: Comprehension.

The Ron Davis Success Story

Ron Davis struggled with reading as a child and still struggles today. Yet he is one of the world's eminent scientists. He writes scientific papers, lectures to university students, and reads, yes reads, enthusiastically and effectively. Is this an aberration? An isolated case? I don't think so. I think Ron's story is relevant, not only to budding scientists, but also to others with reading difficulties. We need to consider the ingredients that made up Ron Davis' success as a reader, thinker, and writer:

- * A passionate interest
- * Avid reading of interesting, challenging texts
- * Self-awareness of his own strengths
- * Clear academic and career goals
- * Persistence despite numerous obstacles
- * Mentors at each level
- * Sociocultural support for his individual interest

The ingredients of Ron's success and the story of his struggles contain several powerful lessons for teachers, especially those who teach struggling readers. Ron's story suggests that teachers should refrain from underestimating the potential abilities of struggling readers, who may show great discrepancies between high versus low skill areas. "Dumbing down" the curriculum to the student's lowest skill levels in one subject can inadvertently lead us to overlook the student's abilities in another subject. To avoid this pitfall, we should encourage students to take challenging courses and nurture the potential for high intellectual development in all students --- those with and those without reading difficulties.

Ron's case study showed that Ron developed high literacy through avid reading about a topic of personal interest. Implicit in this finding is the urgent need for educators to provide captivating materials based on each child's passion, whether it is science, history, sports, or love stories. A student who has difficulty reading standard texts will likely be more enthusiastic about a book that explains a favorite topic of interest. How can we find out what interests each child? One way is by using individual reading interest inventories, such as the one shown in Figure 4 (see Figure 4: Reading Interest Inventory adapted by Rosalie P. Fink). These questionnaires are easy to administer and modify to fit each child's age or

developmental stage. Another less formal way to ascertain compelling interests is by conducting interviews. Ask questions about "the best book" that was ever read to the child and inquire about favorite hobbies (i.e., sports, arts, history, literature, science, travel, etc.). For children who have not had the opportunity to listen to stories or develop hobbies, ask about favorite movies, television programs, videos, DVDs, internet websites, and computer games. Teachers can pick up clues about reading materials from the student's favorite media subjects. Through interviews, we can uncover a student's passionate (or dormant) interests; and then gather materials accordingly.

A few minutes spent interviewing is a fruitful way for a teacher to accomplish two essential goals: (1) establish rapport and (2) discover the student's interests. For busy teachers with limited time to match students with books of special interest, consult A to Zoo: Subject Access to Children's Picture Books, a rich resource that lists children's books alphabetically by topic (Lima and Lima, 1993). Teachers can also use lists of leveled books creatively, selecting titles that reflect each child's individual interests whenever possible. Matching Books to Readers: Using Leveled Books in Guided Reading, K-3 is an excellent source that lists 7500 books by title as well as reading level (Fountas and Pinnell, 1999). A similar resource geared to intermediate - level students is Leveled Books for Readers, Grades 3-6: A Companion Volume to Guiding Readers and Writers (Fountas and Pinnell, 2002). For older students, teachers can use trade books or conduct Internet searches to find appropriate books for each individual. The observant teacher notices what subject animates a student and selects captivating materials that ignite each child's desire to read and learn.

Selecting interesting materials is necessary; however, it is not sufficient. Another key element is vital: time in the language arts curriculum for free reading. Regularly scheduled time for Sustained Silent Reading (SSR) for pleasure is essential, not only for promoting fluency, but also for promoting positive reading attitudes. Reading for pleasure is NOT a frill; rather, it is a necessity. And it fits with the National Research Council's recommendation that time, materials, and resources be provided for daily independent reading of texts of particular interest for each individual student (Snow, Burns, and Griffin, 1998, p. 324). In short, free reading of interesting

books in school is a crucial ingredient for promoting children's literacy development. Implicit in Ron Davis' saga is the resounding message that students be taught that they can learn reading and other skills, even if they struggle and learn differently from their peers. By understanding Ron Davis' complex, sometimes bumpy route to reading and success, and by acknowledging his complex reading profile as an adult, teachers can inform and inspire struggling students, instilling in them the belief that, "I can do it, too!" *

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I used the International Dyslexia Association (IDA) research definition of dyslexia, which, despite ongoing controversies (Snow, Burns, and Griffin, 1998), uses a widely acknowledged categorical model of dyslexia. The IDA definition maintains the classic notion of an "unexpected" reading problem or discrepancy between a person's potential for learning and his or her actual reading achievement, conceptualizing dyslexia as:

a specific language-based disorder of constitutional origin characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing abilities. These difficulties ...are often unexpected in relation to age and other cognitive and academic abilities.... Dyslexia is manifest by variable difficulty with different forms of language, often including, in addition to problems reading, a conspicuous problem with acquiring proficiency in writing and spelling (Orton Dyslexia Society Research Committee, 1994, p.4).

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Figure 1: Learning Interview Schedule developed by Rosalie P. Fink

1. As a child having trouble learning to read, as a student later on, and as an adult with dyslexia today, what special learning strategies have you used to help with reading, studying, and professional tasks? I'm very interested in finding out what learning strategies or tricks you developed that stand out for you as having been particularly useful.
2. I'd like you to tell me about your struggles, obstacles you faced, and learning strategies that worked for you which you feel led to your present success.
3. What is your earliest memory of learning differently from other children?
4. Tell me about preschool (if you attended), kindergarten, and elementary school.
5. What tasks were particularly difficult for you in elementary school, and what specific strategies did you use to master skills such as reading? Writing? Spelling? Learning multiplication tables? Others?
6. How did your early teachers respond to your learning difficulties?
7. Tell me about your family. How did your parents respond to your learning problems?
8. When you were in elementary school, how did other children react to your learning problems?
9. Tell me about your struggles during adolescence. What schools did you attend? Do any courses stand out as having been particularly troublesome?
10. What specific learning strategies did you use to get through English class, social studies, math, science, foreign language?
11. What special services, if any, did you receive during school?
12. What were your experiences with IQ tests and achievement tests? With SATs and GREs?
13. Tell me about your relationships with your parents, teachers, and other students during middle school and high school. How did you feel about yourself during this period?
14. Were there people who were particularly helpful to you? Tell me about them.
15. Tell me how you decided to go to college. Why did you decide to go? Was it expected in your family? How did you choose your college? What was the application process like for you? Did teachers encourage you or discourage you? Tell me about it.

16. What were your experiences getting through all the required (and other) courses in college? What specific learning strategies did you use during college?
17. Why did you decide to go to graduate school? How did you get through the required courses? Were there particular courses or exams that stand out as having been stumbling blocks? How did you get through them?
18. What particular strategies do you use in your work as a professional today?

Figure 2: Tests and Assessments

(1) The DARTTS, or Diagnostic Assessments of Reading with Trial Teaching Strategies (Roswell and Chall, 1992). This is an untimed, nationally normed instrument that spans beginning through advanced literacy levels (ceiling =12th grade); one of its main objectives is to assess a student's relative strengths and weaknesses in reading and help plan an individualized reading program.

(2) The ND, or Nelson-Denny Reading Test of Vocabulary, Reading Comprehension, and Reading Rate, Form H (Brown, Fishco, and Hanna, 1993). This is a college and graduate school reading test that spans ability levels through postgraduate reading levels. It is a timed, nationally normed test created with the objective of providing a trustworthy ranking of student ability in vocabulary development, silent reading comprehension, and reading rate.

(3) The Pig Latin Test (adapted by Fink from Lefly, 1997). This is an informal instrument containing 48 items administered in an untimed format. It assesses awareness and manipulation of phonemes and syllables and other phonological skills.

(4) The Florida Nonsense Passages (adapted from Finucci, 1974 by Gross-Glenn, Jallad, Novoa, Helgteen-Lempesis, and Lubs, 1990). This is an informal instrument that entails reading nonsense words embedded in otherwise meaningful paragraphs. It assesses both reading speed and accuracy.

(5) The Graded Nonword Reading and Spelling Test (Snowling, Stothard, and McLean, 1996). This is an untimed measure of the ability to read and spell novel letter strings. Initially designed for use with children, it is considered suitable for adults with reading difficulties.

(Please refer to the next page for Figure 3: DAR Interpretive Profile)

Figure 4: Reading Interest Inventory adapted by Rosalie P. Fink*

1. What is the best book that was ever read to you?
2. What is the best book that you ever read yourself?
3. What are your favorite hobbies?
4. What after-school activities do you like best?
5. What are some of your favorite movies?
6. What television programs do you like the most?
7. What are your favorite television specials, videos, DVDs, computer games, and internet websites?
8. What school subjects do you find most interesting?
9. What pets, sports, or art activities do you like best?
10. If you could take a trip, where would you go?

*Reading interest inventory. Adapted by Rosalie P. Fink from Burns, P. C., Roe, B. D., and Ross, E. P. (1992). Teaching reading in today's elementary schools (5th ed.). Boston: Houghton Mifflin.

Figure 3 DAR Interpretive Profile

Student Ron Davis Date of Birth 7/7/41 Grade Not Applicable
 DAR Administrator Rosalie Fink Teacher Not Applicable (Adult)

DAR Test	DAR Level
Word Recognition	12
Word Analysis (Check if mastery is achieved.) <input checked="" type="checkbox"/> Consonant Sounds -missed soft c <input checked="" type="checkbox"/> Consonant Blends -missed drip <input checked="" type="checkbox"/> Short vowel Sounds -missed short e & short u out of context; <input checked="" type="checkbox"/> Rule of Silent E misread sit for set <input checked="" type="checkbox"/> Vowel Digraphs <input checked="" type="checkbox"/> Diphthongs <input checked="" type="checkbox"/> Vowels with R <input checked="" type="checkbox"/> Polysyllabic Words Pre-Reading Subtests: Simple matching task. <input checked="" type="checkbox"/> Naming Capital Letters <input checked="" type="checkbox"/> Naming Lowercase Letters - confuses b/d <input checked="" type="checkbox"/> Matching Letters <input checked="" type="checkbox"/> Matching Words - very slow to figure out same or not the same; reported reading them twice to figure it out	
Oral Reading	8
Silent Reading Comprehension	12
Spelling See mistakes in spelling booklet	6
Word Meaning	12

1. For Word Recognition, Oral Reading, Silent Reading Comprehension, Spelling, and Word Meaning, enter the highest level for which the student achieved mastery.
2. For Word Analysis, check the subtests for which the student achieved mastery.

Note: See the TTS *Teacher's Manual*, especially "Part 2: Introduction to the Trial Teaching Strategies" And "Part 3: Preparing for Teaching," for information on reporting DAR results to students and Using results to plan and implement the TTS session with the student.

Subvocalized while spelling and reading silently.