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WHY THE DEAF CAN'T READ

ANSWERS AND SOLUTIONS

Written by

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for LING 590

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May 8, 1990

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Thank you.

Minnie Mae Wilding-Diaz

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For more than 150 years it has been acknowledged that deaf people don't have as complete a mastery of the English language as do their hearing peers. The very first article addressing this problem was published in 1853; the author said, "the general body of our pupils, over...several years [of instruction], leave our schools with a very imperfect knowledge of the language[1] of books and of men" (Rae, p. 25). The author continued to state that the pupils' capacity of "understanding language addressed to them, if it passes beyond the simplest forms, is almost [as] equally imperfect [as their writing skills]" and further said that this had been often "marked and lamented" (p. 26).

In 1868, Gallaudet wrote that after fifty years of education for the deaf in America, it remains a fact that "many pupils of fair intelligence and after industrious years of instruction, leave their respective institutions without an ability to express ideas...in absolutely correct written language" (p. 150).

Almost as early, nonetheless, people involved with deaf education maintain that their pupils "undoubtedly [had] the mental capacity to master language perfectly" (Gallaudet, 1868, p. 150). Indeed, recent research has shown that when cognitive tasks are tested without the use of the English language, deaf subjects generally do as well as hearing subjects (Tomlinson-Keasey & Kelly,

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[1] An important distinction needs to be made before proceeding with analysis of various research over the years. When researchers and writers say deaf people are "without language" they often meant "lacking in English language skills." This doesn't mean the deaf people are without language, per se. ASL adequately meets these people's language needs.

1974; Watts, 1979; Best & Roberts, 1976; and Morariu & Bruning, 1984).

This paper will focus on developing reading skills, first delineating the history of reading and cognitive research with deaf subjects. Next, language acquisition and the reading process itself will be touched upon to show how the two are interrelated. Then selected research will be used to support this author's theory as to why deaf people haven't been able to break through the fourth grade level barrier throughout history, throughout various methods and modalities employed. Implications and ideas for change will then be outlined.

HISTORY OF RESEARCH WITH DEAF SUBJECTS

In the 1910's, with the advent of standardized tests and norms, two psychologists without much prior experience with deaf people started to examine deaf subjects with tests they had already used with hearing people. They wanted to know if tests and norms developed for normally hearing subjects could be "readily applied to" deaf subjects. The first test they tried was the Binet-Simon Scale, which measured mental age. They tested 22 deaf children, and found inherent problems with the verbal directions of the test. A strictly written mode of communication was abandoned in favor of signing, fingerspelling, and speech. However, even after scores of the "obviously feeble-minded" subjects were deleted, the deaf children were still retarded an average of 3.4 years. The researchers concluded that the Binet-Simon scale wasn't adequate,

as it was, for deaf subjects, and that, because the deaf subjects were observed to be of normal or average intelligence, norms established for hearing subjects needed to be moved forward three years for deaf subjects (Pintner & Paterson, 1915).

The very first research to record the phenomenon of most deaf people reading below the fourth grade level was published in 1916. The same two researchers mentioned above tested 30 deaf subjects at a day school with two educational tests "with tentative standards and norms established earlier [for deaf subjects] by the same authors" (Pintner & Paterson, p. 417); to test intelligence, they used the Digit-Symbol and Symbol-Digit Tests; to test reading, they used the Traube Language Scales (which includes 12 pairs of progressingly difficult sentences to complete). Again, the mental ages of the deaf subjects were found to trail those of hearing subjects, but by about two years. The results of the reading tests were as follows: eight subjects were found to be at below the second grade level, nine at the second grade, six at the third, four at the fourth, two at the sixth, and one at the eleventh. Of the two at the sixth grade level, one was an adult attending evening school at that day school, and the other was a hard-of-hearing boy. The woman at the eleventh grade level had lost her hearing only recently.

In 1917, Pintner and Paterson expanded upon this latest finding by testing 570 deaf subjects with the Trabue Language Scales. Because sentence completion was used as a common tool of instruction among teachers for the deaf, the researchers felt the

test wasn't going to be a new and confusing experience for the subjects. Results of combined scores of all the subjects regardless their school, onset of deafness, or method of instruction, are listed below. The first row of numbers indicate the number of years at school the subjects had had at the time of testing. The second row shows their average reading grade level.

12	11	10	9	8	7	6	5	4	3	2
3.8	4.0	4.0	3.3	3.5	3.0	2.8	2.5	-2.0	-2.0	-2.0

The graph shows that these deaf subjects moved up to a second grade level during approximately their fourth year of school, and then "cre[pt] slowly to the third- or fourth- grade ability by the twelfth year" (p. 224), and that "in spite of the great emphasis placed on language in the teaching of the deaf, the progress of the pupils is incredibly slow" (p. 225). Only 6.4 percent of the deaf children tested achieved a reading level beyond the fourth grade.

The researchers also examined the sentences in the test to see if the order of difficulty was the same as that for hearing subjects, and found that, yes, the order was the same (except for one pair in which the first sentence was more abstract than the second). This discovery caused them to conclude that apparently language development for deaf people move along the same lines as those for hearing people, albiet much more slowly.

In 1921, the two researchers again compared deaf subjects with hearing subjects, this time studying their respective abilities to follow printed directions. They explained, most logically, that following printed directions was much different than following oral directions, especially for deaf children. Two forms of Woodworth

and Wells' Easy Directions Test, each of which had 20 directions to follow were used and ten groups of deaf and hearing subjects from age 6 to adult were tested. While the deaf subjects did "show a fairly constant increase in ability" (Pintner & Paterson, p. 470) in following printed directions, never did they, at any age, get more than seven answers correct, while all hearing children older than eight got at least seven correct answers. The median for the deaf subjects never reached past that for a hearing subject at age eight; on the other hand, the median for the hearing seven-year-olds equalled that for the 14- to 16-year old deaf subjects.

In 1928, Farquhar studied 41 deaf subjects and compared the results of their test scores on a reading test with norms established for hearing subjects to see "what 'kinks' might be in the minds of the average deaf child" (p. 264). Of the 41 subjects, two tested higher than the norms; one had good hearing and the other was an "omnivorous reader" (p. 266). With these two exceptional subjects deleted from the group, scores were examined in each of the three subtests: paragraph meaning, sentence comprehension and word meaning. Nine of the subjects did better on paragraph meaning, 22 did better on the latter two categories, and eight did equally well. The number of mistakes didn't increase paralleling the difficulty of material encountered. Farquhar concluded that the children had three faults: 1) carelessness, or disregard of instructions (in part answered by Pintner and Paterson's 1921 study), 2) low vocabulary, and 3) an inability to recognize antecedents of pronouns.

In 1929, preparatory and freshmen students at Gallaudet College were tested with the then new Stanford Achievement Tests, Advanced Exam with the following results: the freshmen students (average age: 20.6) tested at the median grade level of a little above the tenth grade (with a range from seven to twelve plus). The preparatory students (average age: 21.2) ranged from the sixth grade to the eleventh, with a median average of not quite ninth grade (Hall, 1929). While these results are above average for deaf people, they are certainly not the desired level for college students. Additionally, only the "cream of the crop" went to Gallaudet College back then. Many of these students may have had lost their hearing later in life, after language had been acquired.

Lyon, et. al., in 1933, published yet another article about the reading achievement levels of deaf subjects, this time discussing the results of some reading, arithmetic, and intelligence tests that students at the Illinois School for the Deaf took. Only the paragraph reading and word meaning scores will be listed below. The first column of numbers lists the grades the subjects were in when they took the test. The next two columns list the grade levels achieved by the students in each class. Finally, the average age of the subjects in each class is given. The last few scores may seem a little optimistic, especially when taken in view of the earlier results, but when ages are accounted for, they are still a disappointment.

Grade	Paragraph Meaning	Word Meaning	Average Age
3	-2.6	-2.6	10.7
4	2.8	3.2	14.0
5	2.8	3.7	14.2
6	3.1	3.7	16.5

7	3.8	4.3	15.7
8	4.2	4.8	18.0
9	4.7	4.8	18.3
10	4.8	5.1	18.2
11	5.9	5.8	19.0
12	6.7	7.2	19.2

This graph shows that reading achievement increase an average of half a year per year after reaching the second grade level. It also shows deaf subjects do better with word meanings than with paragraphs.

In 1938, Springer explored the question, "Do deaf and hearing subjects differ in their mental ability when the language factor is eliminated, and their intelligence is measured by means of a non-language test?" (p. 138). He tested 330 deaf and 330 hearing children of similar ages, backgrounds, nationality, sex, and social status. Using the Goodenough Draw-a-Man Intelligence Test because it involved no language, neither written nor receptive, Springer came up with the following results: The IQ of the deaf subjects fell between 40 and 180, with the middle 67% ranging from 73 to 119 (the median was 96.24); the IQ of hearing subjects fell between 50 and 180 with the middle 67% falling between 79 and 125 with a median of 102.21. So while the hearing group received slightly better IQ's than did the deaf group, the differences, at any age, were not significant. This was the first challenge to Pintner and colleagues' theory that deafness caused impaired intelligence.

Mykelbust's 1960 study (cited in King & Quigley, 1985) analyzed the results of several psychological tests done with deaf subjects and found that when verbal factors were controlled, the deaf did equally well in global tests such as the Wechsler Intelligence Scale for Children, but differed in certain subtests. He concluded

that deaf people were "quantitatively similar but qualitatively different" (p. 2). He further developed what he called an "organismic shift hypothesis" trying to explain that because basic life experiences were altered due to the absence of sound, intellectual functions were shifted to other senses, thus influencing inherent intelligence structures. In this way, he felt that deaf people were naturally more concrete and less abstract.

In 1963, Wrightstone, Aronow, and Moskowitz, responding to teachers' need of reading tests with standardized norms for deaf people, studied different tests and picked the Metropolitan Achievement Test, Elementary Reading Test, Test 2: Reading as the most suitable for deaf subjects between ages 10 and 16. Younger deaf children were judged "not generally ready for testing because of the late start [they] get in language" (p. 312). Note that the elementary test was chosen for use. This test was given to 5307 students from 73 schools and classes for the deaf in America and Canada. Norms were then developed from the results, and teachers of the deaf now had a criterion with which to measure their deaf students. This study didn't report the grade equivalents of the deaf subjects' scores as compared to hearing norms, but the very fact that it was necessary to develop separate norms for deaf subjects shows that the two standards weren't comparable.

Furth (1966) printed a two-page summary of all the research in reading thus far published; it has been extensively referred to in later publications related to deafness. In this compilation, it can be seen that only eight percent of all the deaf subjects ever tested, read above the fourth grade level. Also widely quoted is

the fact that the median grade level for ages 10-11 was 2.7, and for age 15-16, 3.5; this shows a growth of .8 grade during the five years in between.

Furth also extensively tested the cognitive abilities of deaf studies and published an article in 1960 (cited in King & Quigley, 1985) saying there were few if any differences between deaf and hearing cognition development. He argued that "cognition operates largely independent of language, [and that] language was of minor concern in investigating cognition" (p. 6). This would explain the fact that deaf people function quite well in society despite never developing fluency in the society's langauge (King & Quigley, p. 13).

In 1971, Hammermeister tested 60 deaf adults seven to thirteen years after they had left school with the same achievement test they had taken at school; there were increases in word meaning scores but none in paragraph meaning. Thus, after school, deaf people do continue to learn new vocabulary, but they continue to have problems reading connected text.

Two comprehensive studies that further document findings of an average of a third- or fourth- grade reading levels for most deaf subjects were done by the Office of Demographic Studies at Gallaudet; in 1972, DiFrancesca (cited in King & Quigley, 1985) outlined that after testing 17,000 deaf students between the ages of 6 and 21, it was found that the average gain in grade level per year of school was .2 year. In 1977, Trybus and Karchmer (cited in King & Quigley, 1985) reported testing 6871 deaf students, the average reading grade level for those at age 20 was 4.5, and that

only ten percent at age 18 read at the eighth grade level or beyond.

Best and Roberts (1976) used the HOME Inventory to analyze the home environment of sixteen deaf children between the ages of 23 and 38 months, then tested the deaf children and sixteen hearing children matched for age, with the Infant Psychological Development Scale (IPDS) to determine how far the deaf children were progressing in the first stage of Piaget's cognitive development; namely, the sensorimotor stage. Piaget believes it is the child's direct [italics added] involvement with the environment that promotes progress through this stage, and that this stage is "crucial to later development of thought" (p. 560). Results of the HOME inventory was favorable; the deaf children were allowed active and independent interaction with their environment. The mothers of the deaf children were rated less premissible and punitive than the norms established (in direct contracticton with other research that noted mothers to be overprotective of their deaf children, probably because 15 of the 16 families were involved with a preschool program for the deaf children). The deaf children performed as well as the hearing controls did in the IPDS, except, as might be expected, on the test of vocal imitation. This supported Piaget's contention that progression through this stage is largely based on the child's interaction with his environment, and that language plays a small role. However, the poorer performance in vocal imitation foreshadows later lag in language skills. Second year data on the same children showed the "deaf

children falling behind on verbal concepts and tending to classify at a lower level" (p. 563).

Finally, in 1979, Watts investigated whether "the development of deaf children's cognitive abilities [are] largely unaffected by their lack of verbal language," and whether poor performance, if such happened, can be "reasonably explained by a lack of normal experience" (p. 47). He tested three groups of 70 children (deaf, partially hearing, and hearing) to obtain a sample of the intelligence spread. Three experiments were designed to test development of "quantitative, spatial and social thinking in deaf children" (p. 46). In the first experiment, the hearing subjects did better, but the other two groups started off with the partially hearing group doing better until age 15 and 16 when the deaf group did significantly better. The fact that the deaf subjects increased in their ability to do quantitative tasks showed that development in this area of thinking wasn't dependent on langauge. In the second group, by the time the subjects hit age sixteen, the deaf group was "very slightly behind the other groups which were more equal" (p. 53). Again, lack of language didn't seem to influence spatial thinking. Finally, in the third test, the deaf students did better than or as equally well as the partially hearing group, and they in turn, did better than the hearing group. Watts concluded that "the develoment of deaf children's cognitive abilities is remarkably unaffected by the absence of a verbal language" (p. 55), and that it is the children's active interaction with their environment that develops cognition.

SUMMARY OF RESEARCH

Most reading research with deaf people sum up to this: Deaf readers seldomly read beoynd the fourth grade level in word meaning and paragraph comprehension tests. Some teachers, however, report that their students "can't read material at the grade level the tests say they are at" (Quigley & Kretschmer, 1982). Numerous research studies have been printed analyzing specific potential problem areas, such as vocabulary, words with multiple meanings, grammar and syntax, and idiomatic/figurative langauge (Bryans, 1979; Newby, 1974; Conley, 1976; Schwartz, 1978; Doehrig, et. al, 1978; Wilbur, 1982; LaGow, et. al, 1976, and others). Numerous other articles suggest ideas on how to remedy the problem, often by suggesting how to teach students to understand the passive voice, for example. While many of those ideas certainly merit looking at, many of them remain at the word or sentence level, or suggest ways to make text more connected to the deaf reader, albiet artifically (Gregory, 1982; Wilbur, 1977). While whole discourse has been discussed, mainly in the form of how teacher-produced material could help comprehension of texts (Gamble, 1983; Haggerty, 1986), rarely does one find discussion on how to promote reading among deaf children as a natural extension of the chidlren's developing language and thinking processes (notable exceptions include the articles by Soderbergh (1985), Gormley & Geoffrion (1981), Nielsen (1985), and Anderson & Laird (1972)). Moreover, the reading process as it is for the deaf been rarely been examined, except for Webster's book on deafness, development and literacy (1986), and

Ewoldt's articles (1978 & 1981) on psycholinguistic descriptions of some deaf children's reading (to be discussed later).

Cognitive studies are best summed up by Quigley & Kretschmer (1982a) and King and Quigley (1985): Before the 1940's, because of Pintner and Paterson's early cognitive studies, deaf people were thought to be intellectually inferior both quanitively and qualitively. As tests became less and less dependent on verbal directions, deaf people were thought to be quanitively similar to hearing people, but qualitively different in that they were more concrete than abstract. After Furth's studies in the 1960-70's, deaf people were thought to be intelectually normal. Differences still remain in certain areas such as memory performance, abstract thinking, and creativity (King & Quigley, 1985), but they are attributed more to environmental factors such as lack of experience, inability of the examiner to adequately explain the tasks involved, and bias in the tasks themselves (Quigley & Kretschmer, 1982a), and not to deafness, per se.

So, in conclusion, the cognitive-domiant theory prevails; thought is developed before and/or without language. There is absolutely no cognitive reason for the reading problems of deaf people. Why, then, is the problem so prevalent? What can be done about it?

LANGUAGE ACQUISITION

Before we can discuss solutions, it will be helpful to review a few of the required ingredients for language acquisition. Generally, language can't be taught, per se (except with adults

learning a second language), but needs to be acquired from a language-rich environment where opportunities are provided for active use of the language. Language development goes from imitating to hypothesizing rules and trying them out to modifying the rules when or if necessary to being able to use the language in any form, including irregular (Bowerman, 1982; Moskowitz, 1985). It is also known that to be able to make sense of the language being used, the enviroment has to be facilitative, meaning the language user and model has to talk about the "here and now," repeat, use shorter and clearer sentences, and use more exaggerated intontation (Furrow, et. al, 1978). As people become more and more expert in their use of langauge, they are able to manipulate it to the point where they can choose to use the least possible words, yet convey the same meaning as if they had uttered a complete sentence. For example, "Going?" means the same thing as "Are you going?" Naturally, paralinguistic features such as intontation, facial expression, and the dialogue context itself further add to the meaning.

THE READING PROCESS

For many years, the traditional "bottom-up" philosophy of reading, which upholds that letters need to be known before words can be understood, and words before sentences, and so on, has been the mainstay of reading instruction. Advocates of this philosophy argue that to get meaning from reading, it is essential to know what is on the page. Smith (1978) argued the very opposite: what readers see on the page is not as important as the knowledge and

predictions they bring with them. He maintained that concentrating on correctly reading each word merely "bottlenecks" short-term memory and makes reading difficult if not impossible. Children naturally hypothesize, experiment (try out), evaluate the results, and accept/reject hypotheses about everything they encounter during their language developing years, including differentiating cats and dogs (which, by the way, can't be taught if you think about it), and this is learning (p. 85). And children do the same thing while developing reading skills. Smith further argued that "child[ren] can't be taught to read" (p. 6). In other words, he maintained that reading is acquired rather than learned via some kind of teaching. King & Quigley (1985) similarily contended that reading is part of a "general language comprehension process" which includes early learning experiences, schema, cognitive, and linguistic develoment, figurative language abilities and metacognitive skills (p. 54). Exercises to help develop top-down skills include sharing stories, retelling them (as opposed to reciting), making use of environmental print, and developing child-centered narratives with the langauge experience approach (Maxwell, 1986).

Webster (1986) contended that utilizing a completely top-down process, as described by Smith, takes up too high a level of thinking to be very efficient use of the brain which needs space to think about what is being read and to integrate it into the long-term memory. He promoted an integrated approach philosophy which states that good readers use as much clues as they can from the low-level strategies such as words and syntax to "free up" higher-level thinking space. In other words, readers have sources of

information and make predictions "independently, simultaneously, and influencing each other" (p. 117). He cites experiments in which good readers read much too fast to have had read each letter and word; on the other hand, other experiements have shown poorer readers depending more on context clues than better readers. Good readers recognize words faster and thus move on to meaning quicker, while poorer readers need to analyze the contenct more to get the meaning, thus read slower. This theory about the reading process says that while you probably can't really teach top-down skills, essential bottom-up skills can be strengthened to help facilitate the process. However, these bottom-up skills are useless without the narrative and experiental background that top-down methods help develop (Maxwell, 1986).

It is fascinating to see how quite similar the reading process is to language acquisition. A beginner reader begins by recognizing letters and words, similar to the imitation stage in language acquisition. He develops hypotheses about how the letters and words fit together, and as he becomes more and more skilled, he uses the printed information more and more like paralinguistic features: deriving meaning from print immediately and effortlessly and as part of a larger whole (his predictions about what the text is talking about). And to develop good reading skills, children need to be read to; they need adult readers and models to analyze and develop hypotheses about. To be understood, early books have to be shared with little children - similar to the "here and now" requesite of language acquisition. Lastly, but not least, both

Smith and Webster argue that learning to reading is an active process, just as learning a language is active.

THE READING PROCESS FOR THE DEAF

Are the above described processes similar for deaf readers? Unfortunately, there is dismally little research into the strategies deaf readers use while reading. However, Ewoldt (1978) proposed that Goodman's reading universal hypotheses, which have been found to be true for English, English as a second language, Yiddish, Polish, and Spanish, can also explain the reading processes of deaf readers. She discussed how each of Goodman's eight statements about the reading process also applied to the deaf readers she analyzed. (Goodman feels that to effectively analyze children's reading strategies, the testing situation needs to be as natural as possible. He developed a taxonomy in which miscues are analyzed to see whether they are graphically like the printed word, phoentially like it, of similar syntactic structure, or sematically alkie and thus acceptable in terms of meaning. This form of analysis takes in account the reader's strengths as well as areas that need strengthening, and accepts miscues if they are logical substitutions, additions, or omissions that are obviously based on educated predicting of meaning [Goodman, 1973].)

Ewoldt (1981) used a modified version of Goodman Taxonomy of Reading Miscues (1976) to analyze the reading processes and strategies of four deaf children while they read in sign language. The reading sessions were videotaped and transcribed. Miscues were analyzed and though the results are too lengthy to discuss here,

the following reading model for deaf readers (based on the model developed by Goodman) was developed: START/OPTICAL CYCLE: The reader knows he is reading English and he is able to interpret it into ASL. His fixations follow the normal course (left-to-right), perhaps using more fixations when fingerspelling so to see individual letters rather than words. However, if the word is known and has no sign, the reader uses the same number of fixations. PERCEPTION CYCLE: The deaf readers "showed some evidence of having pulled graphic information from the near periphery" (p. 81). SYNTACTIC CYCLE: In general, readers assign internal grammar rules and deep structure meanings to the surface structure of the sentences they are reading. Deaf readers have a wider range of language (English, Siglish, ASL, pantomime, and fingerspelling) with which to represent the text, but they also "avoided the deep structure by...fingerspelling...[and by using Siglish]" (p. 82). CONSTRUCT MEANING: Deaf readers who use fingerspelling or literal translations may also move to meaning if they start signing the words for which they fingerspelled, or if they substitute ASL concepts, but "meaning may not be reached immediately". The mean retelling score of the deaf readers was "comparable to [that of]...bilingual readers in Goodman and Goodman's latest miscue study" (p. 85). If fingerspelled words continued to be fingerspelled during retellings, this indicated the reader understands the word and knows there is no sign for it. BREAKDOWNS AND SHORT-CIRCUITS: Breakdowns are when the readers "cease to be active participants in the reading process" (p. 85). They occur because of "overattentiveness to graphic information, due to

difficulty of materials, too much concern for precision in reading, or instructional emphasis on rendering the text in English rather than [ASL]...[and unknown English idioms]" (p. 85). Short circuits are evidenced by overcorrection and perseveration; these move the reader "away from meaning and back to graphic information" (p. 86); using Siglish may prevent readers from going to deep structure analysis (and meaning). Efficient short circuits bypass syntax and go to meaning; this is evidenced by pantomime, and "syntactically unacceptable but semantically acceptable miscues" (p. 86).

In other words, the deaf readers exhibited reading strategies remarkably similar to those employed by hearing readers. We can now move on to discussing, because deaf readers aren't so different from hearing readers, why they have consistently failed to move beyond the fourth grade level.

CAUSES OF POOR READING PERFORMANCE

Different researchers have suggested possible reasons for the apparent inability of deaf readers to read past the fourth grade level. Webster (1978) suggested that deaf readers may read better than test results imply they do, and that the "plateau" effect may be caused by the construction of reading tests themselves. When the grade level is around the fourth grade level, the paragraphs become more complex and less bottom-up skills are required for comprehension. Ewoldt, with her 1981 study, showed that deaf readers read beyond their tested reading grade level when they are allowed to read complete, whole stories. This suggests the usually brief sentences and paragraphs on reading tests may be

themselves inhibiting comprehension by not including enough content and background information. Pintner and Paterson's 1921 study about the inability of their deaf subjects to follow printed directions adds credence to possible inherent test bias.

While these are valid considerations to take into account, they don't answer the whole question of why so many deaf people (approximately 90% of all deaf subjects ever tested) don't read English effectively. Even though the earliest researchers didn't have the mesurement tools we do today, there is enough similarity between the statements made during the early years and the information we have today, to attest that the situation has occurred for more than 150 years, throughout various modalities (manual and oral).

In this writer's point of view, there are two main causes of the widespread low reading inability among deaf people: classroom instruction strategies and teachers for the deaf. In an 1918 article, Jones complains that "systematic reading had almost been entirely omitted [and that teachers were depending on] segregated sentence work" (p. 243). This "anti-language-acquisition" situation has not changed much over the years. Brennan (1976, cited in Webster, 1986) notes three main processes teachers of the deaf employ: imitation, repetition, and reinforcement. Children do not learn by passive imitation and repetition. Craig and Collins (1970, cited in King & Quigley, 1985) reports that a common pattern found in deaf classrooms is that of teacher dominance and control; they record that teachers initiated conversations eleven times as much as their students did!

In another landmark study, Howarth, et. al, (1981) analyzed some naturally occurring reading lessons to investigate links between reading achievement and exposure to reading, between teaching methods and reading progress. First they selected fourteen deaf children (ages 6.6 to 10.3) who were having one-on-one reading instruction and then found fourteen hearing children (ages 4.11 to 9.1) who were also reading the same stories from the same textbooks. The hearing children were a little younger because of the lower reading ability of the deaf children, but the important thing was that matched deaf and hearing children were reading the very same story from the very same textbooks. Each instruction period was videotaped and transcribed. Stops, either by teacher or child, were analyzed, both for the number and for the reason. Reasons were classified to one of four functions: a) phoneme-grapheme stops (stops to correct miscues, ususally because the child didn't know the word or how to pronounce it); b) lexical stops (stops to make sure the child understood the meaning, or to explain/demonstrate the meaning); c) articulation stops (stops to repeat the word more correctly or with a different intontation; and d) reinformcement stops (stops to praise the child). Findings were as follows: The deaf children were stopped about twice as much (an average of 17.6 stops per reading session as opposed to 8.9 for the hearing children), and there was a marked difference in the reasons for the stops. For phoneme-grapheme and articulation stops, there weren't a significant difference in the number, though the deaf children were stopped more often for these reasons. For lexical stops, teachers for the deaf children spent significantly more time