DOCUMENT RESUME

ED 135 197 EC 093 173

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TITLE Rubella Deaf-Blind Child: Implications of Psychological Assessment. Proceedings.
INSTITUTION California State Dept. of Education, Sacramento.; Southwestern Region Deaf-Blind Center, Sacramento, Calif.
SPONS AGENCY Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C. Centers and Services for Deaf-Blind Children.
PUB DATE 76
NOTE 40p.

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Blind; Conference Reports; *Deaf; *Deaf Blind; *Evaluation Methods; Multiply Handicapped; Rubella; Severely Handicapped; *Student Evaluation; *Testing

ABSTRACT

Presented are proceedings of a conference involving authorities in testing and evaluating the blind, deaf, and deaf-blind. In a paper titled "Psychological Implications of Assessing the Deaf", C. Goetzinger discusses references used in audiology, anatomy and physiology of the ear, degrees of hearing impairment, and implications of the various degrees of hypacusis. Several tests useful for evaluating the visually handicapped child are reviewed in C. Davis's article, "Psychological Aspects Related to Psycho-Diagnostic Evaluation of Blind Children". C. Whiting provides guidelines for report writing in "Assessment of the Deaf-Blind Child in the Public School". In "The Psychological Implications of Testing--A Cautionary Note", E. Greenleaf warns against quoting test results which label the deaf-blind child as retarded. A final paper titled "Psychological Implications of Assessing the Deaf-Blind" (by F. Jamieson) reviews such evaluation techniques as formal tests, informal tests, and observation. Also provided are an outline on areas of assessment and a resource list of tests for use with deaf-blind children. (SBH)

Proceedings

Rubella Deaf-Blind Child: Implications of Psychological Assessment

Prepared by Carole Rouin, under the direction of

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This publication, which was funded under the provisions of Public Law 91-230, Title VI, Education of the Handicapped Act, Part C, Section 623, was published by the California State Department of Education, 721 Capitol Mall, Sacramento, California 95814. The activity which is the subject of this publication was supported in whole or in part by the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

Printed by the Office of State Printing
and distributed under the provisions of the
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1976

Preface

Since the turn of the century, when psychologists became interested in learning about the behavior of the deaf, great strides have been made in the development of tests for use with persons with specific handicaps. Among those are a number of nonverbal tests that were developed with the deaf in mind but that have also been used with children with other language handicaps.

The testing instruments, which are sometimes adapted for use with the handicapped, have, in many cases, not been studied for reliability, nor have the interpretations been validated, particularly for use with the deaf-blind. This means that while more and more tests are being developed, we must carefully consider the limitations of each and choose the ones we use in accordance with the needs that are to be met.

The speakers at this first conference for psychologists were invited to participate because they are authorities in testing and evaluating the blind, the deaf, and the deaf-blind; and these conference participants have delineated with clarity and precision the testing instruments now available in each area.

Although no specific tests to measure the intelligence or functioning level of the deaf-blind have been developed, we hope that this conference will stimulate interest in the need to develop such instruments for the children with whom we work.

WILLIAM A. BLEA
Project Director,
Southwestern Region Deaf-Blind Center

Contents

Psychological Implications of Assessing the Deaf

Presented by Cornelius Goetzinger
Professor, School of Medicine, University of Kansas Medical Center, Kansas City, Kansas

I don't know how much background you have in audiology; so, before getting into the psychological implications of hearing loss, I will review briefly some basic information. First, I will mention a few references used in audiology; we have changed reference levels within the last 10 years, and even those who read the literature are still confused by it. The next area I will cover is the anatomy and physiology of the ear, because the type of deafness is an important consideration in rehabilitation. The incidence of deafness is also important, and there are new data available on this. Then, I will discuss hearing impairment of all degrees, not just with reference to the deaf. If you are psychologists in the school system, you are going to be dealing with children who have a wide range of hearing loss, and I should like to call your attention to the inherent implications of the various degrees of hypacusis. So with this brief introduction to what we will cover, I will begin.

Reference Levels

First of all, we want to consider some of the basic parameters of hearing (Figure 1). If Figure 1 were inverted, it would be the audiogram with which you are familiar. On the ordinate which goes from 0 dB to 140 dB, we have sound pressure or the *loudness* of the sound. On the abscissa we have *frequency*. This curve shows that we are more sensitive through the range 500 to about 4000 Hz than at either the upper or lower frequencies. The range from 500 to 4000 Hz is important because most of the sounds of speech occur within it. The curve as shown here, designated "Sivian and White," represents the minimum audible pressure at the eardrum. This curve was established by Sivian and White in 1933 and was incorporated into some of the audiometers at that time as the zero reference for earphone measurement. However, as a norm, the curve was too severe for the level of sophistication of that period. Therefore, as a result of a national survey in 1935-36, other norms were developed that were less sensitive than the original curve of Sivian and White. Eventually, the new norms became the American Standards Association (ASA) threshold curve for human hearing that was used subsequently in this country until about 1964. In 1964, the International Standard Organization (ISO) normative curve was published. This reference is virtually the Sivian and White curve of 1933, which may be seen in Figure 1.

The so-called Brownian movements refer to the random movements of the molecules of the air which generate a very faint sound by their activity. The sound generated by the Brownian movements is at −86 dB with reference to a zero dB level (0 dB) of one dyne per square centimeter. Relative to the same scale, the human threshold for sound is at −74 dB per square centimeter. Since the −74 dB represents an average threshold, it is more than likely that individuals with superior threshold sensitivity could hear the Brownian movements of the air with the ranges 1000-3000 Hz, if they were in an environment that was quiet enough.

Next, I should like to make a comment or two on the frequency range of human hearing. Research has determined that we are capable of hearing sounds over a range of 20 to 20,000 Hz. (Figure 1 does not show the full frequency range of hearing.) While this is certainly a wide range of frequencies, nevertheless, it is not comparable to the frequency range of some animals. For example, the porpoise has a frequency range of 150 to 150,000 Hz. Our friend, the dog, can hear sounds from 15 to 50,000 Hz, and the cat from 60 to 65,000 Hz.

As may be seen in Figure 1, the zero dB (0 dB) sound pressure reference is .0002 dyne/cm^2. Relative to this scale, 20 dB is the zero dB (0 dB) reference for speech, and 9 dB is the 0 dB reference for the average of the pure tone thresholds at 500-1000-2000 Hz. The threshold for speech is less sensitive (acute) than the average threshold for tones. In short, it takes more sound pressure to reach the 50 percent point for repeating speech than for identifying simple pure tones. However, the speech detection or awareness threshold (the level at which speech is identified only as sound 50 percent of the time) is at 12 dB, or

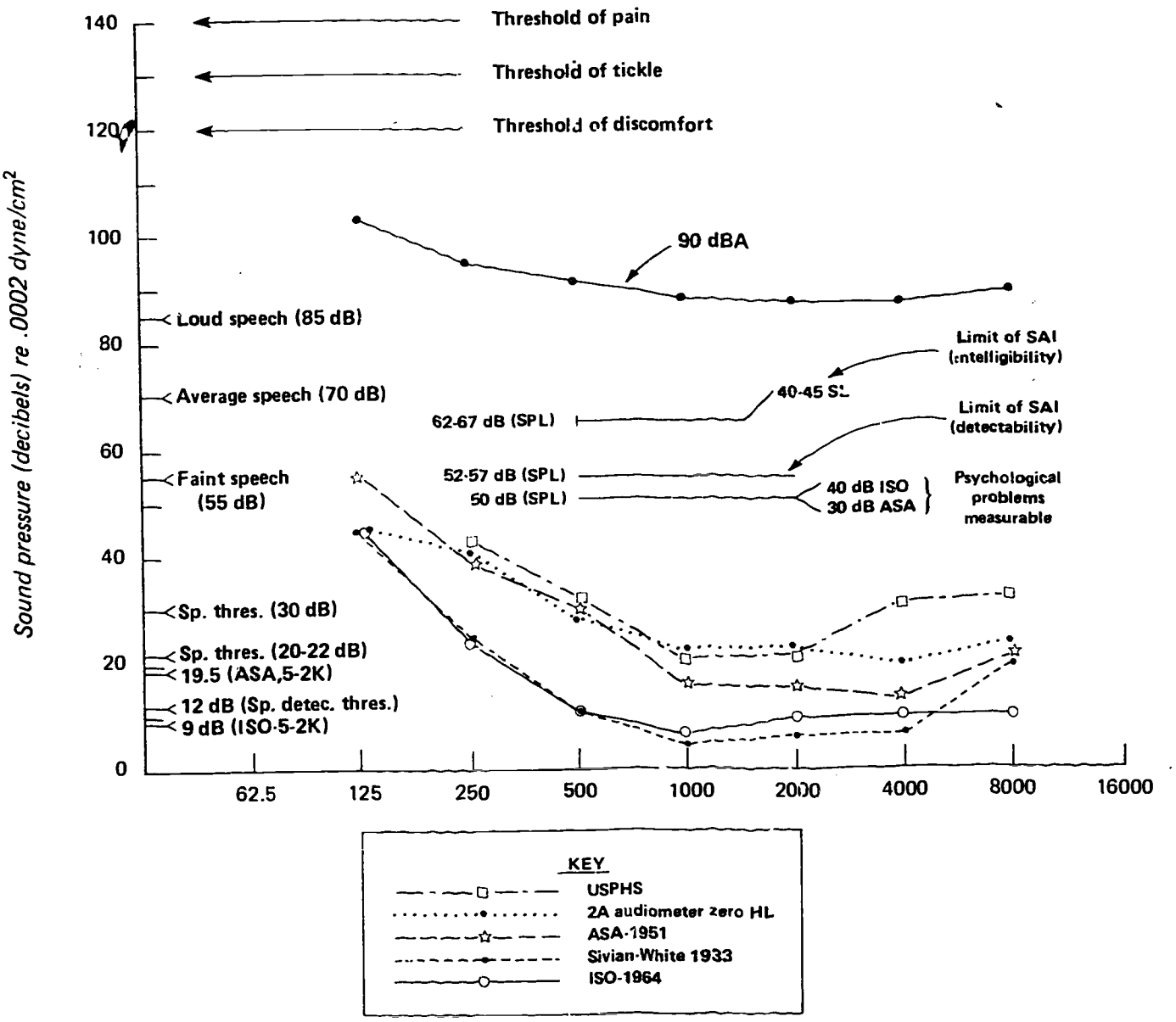


Fig. 1. Sound Pressure and Hearing

virtually the same as for the tones. Also shown are the levels of faint speech (55 dB SPL or 35 dB re threshold for speech, i.e., 55 dB minus 20 dB = 35 dB), of average speech (70 dB SPL or 50 dB re speech threshold) and of loud speech (85 dB SPL or 65 dB). Other levels of more than cursory interest are the 90 dBA noise level curve which represents the maximum level of exposure for an 8-hour work day in each 24 hours which is permissible (Britain uses an 85 dBA level, which the U.S.A. is likely to adopt eventually), the threshold of discomfort at 120 dB SPL, of tickle at 130 dB SPL, and of pain at 140 dB SPL. Other important levels presented on Figure 1 are (1) the level at which psychological problems contingent upon hearing loss become measurable in children (40 dB ISO or 30 dB ASA re the 500-1000-2000 Hz avenue, or 50 dB SPL); (2) the levels at which the hearing threshold becomes socially inadequate in adults called the limit of social adequacy index (SAI) detectability (52-57 dB SPL), and the limit of SAI intelligibility (62-67 dB SPL). Detectability refers to the identification of speech as sound and intelligibility of speech as communication.

Figure 2 is the audiogram with which most people are familiar. Hearing levels in the 0 to 25 dB

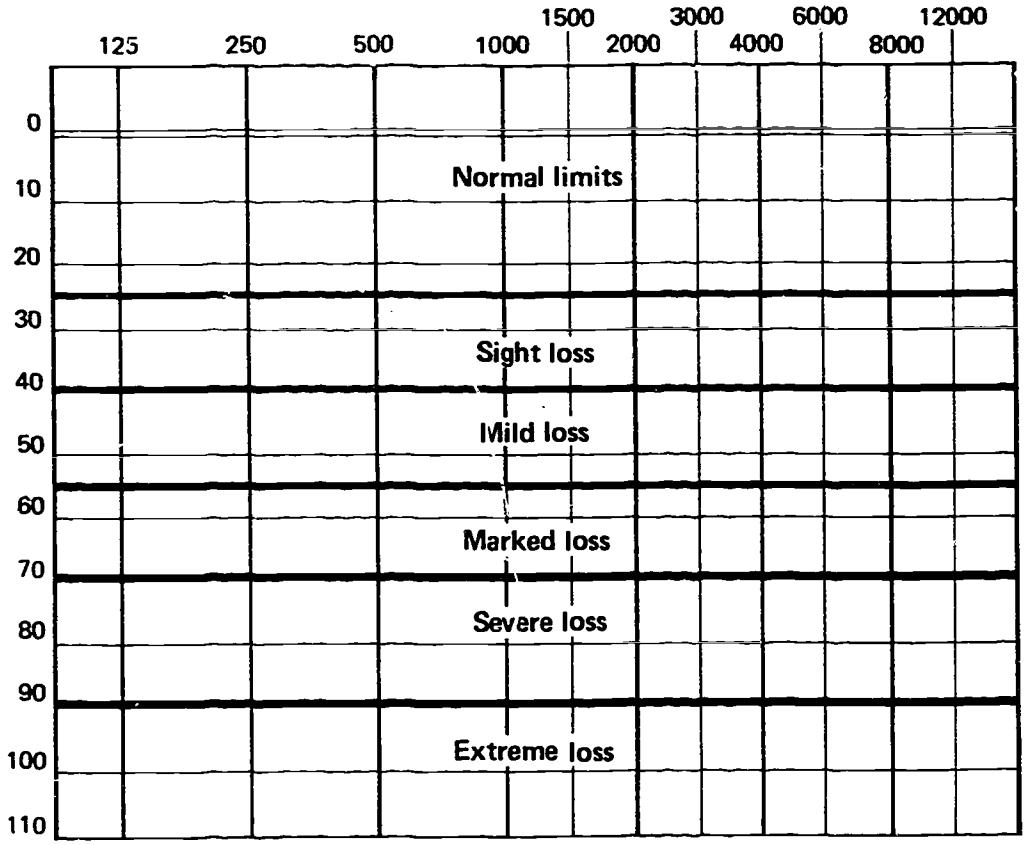


Fig. 2. Hearing Levels

range are within normal limits, those within the 25 to 40 dB range constitute a slight loss, and the mild, marked, severe, and extreme categories are, respectively, 40-55 dB, 55-70 dB, 70-90 dB, and 90 dB plus. Generally speaking, children with hearing losses of 70 dB and greater are considered to be educationally deaf. Psychological problems are measurable in children when the hearing loss in the better ear reaches the 40 dB ISO pure tone average level. Adults with the same degree of hearing loss begin to manifest social inadequacy. Persons whose hearing loss lies within the mild classification frequently need a hearing aid. The area of greatest satisfaction from a hearing aid is within the 55-80 dB range. Above 80 dB one receives partial help in accordance with objectives. In addition, hearing aids are frequently advisable in special situations.

Anatomy

The ear, for purposes of discussion, is divided into three parts, namely, the external, middle, and inner ears (Figure 3). The external ear extends from the auricle, laterally, to the tympanic membrane or drum, medially. The length of the external canal in the adult is about one and one-quarter inches. Medial to the drum is a small cleft which contains the three ossicles or ear bones. In their order of articulation from the lateral to medial direction they are the malleus (hammer), incus (anvil), and stapes (stirrup). The last bone, the smallest in the body, is inserted into the oval window, behind which is the fluid-filled vestibule containing the utricle and saccule. Within the cochlea, which coils off the vestibule, is located the Organ of Corti, the sensory epithelium of the inner ear. The eighth cranial nerve, or nerve of hearing, leaves the cochlea and courses through the internal canal to the brain stem, and then to the higher centers in the brain. The semicircular canals, which in conjunction with the utricle and the saccule constitute the organs of equilibrium, arise from the utricle in the vestibule.

With the foregoing discussion in mind, let us now consider the various classifications of deafness.

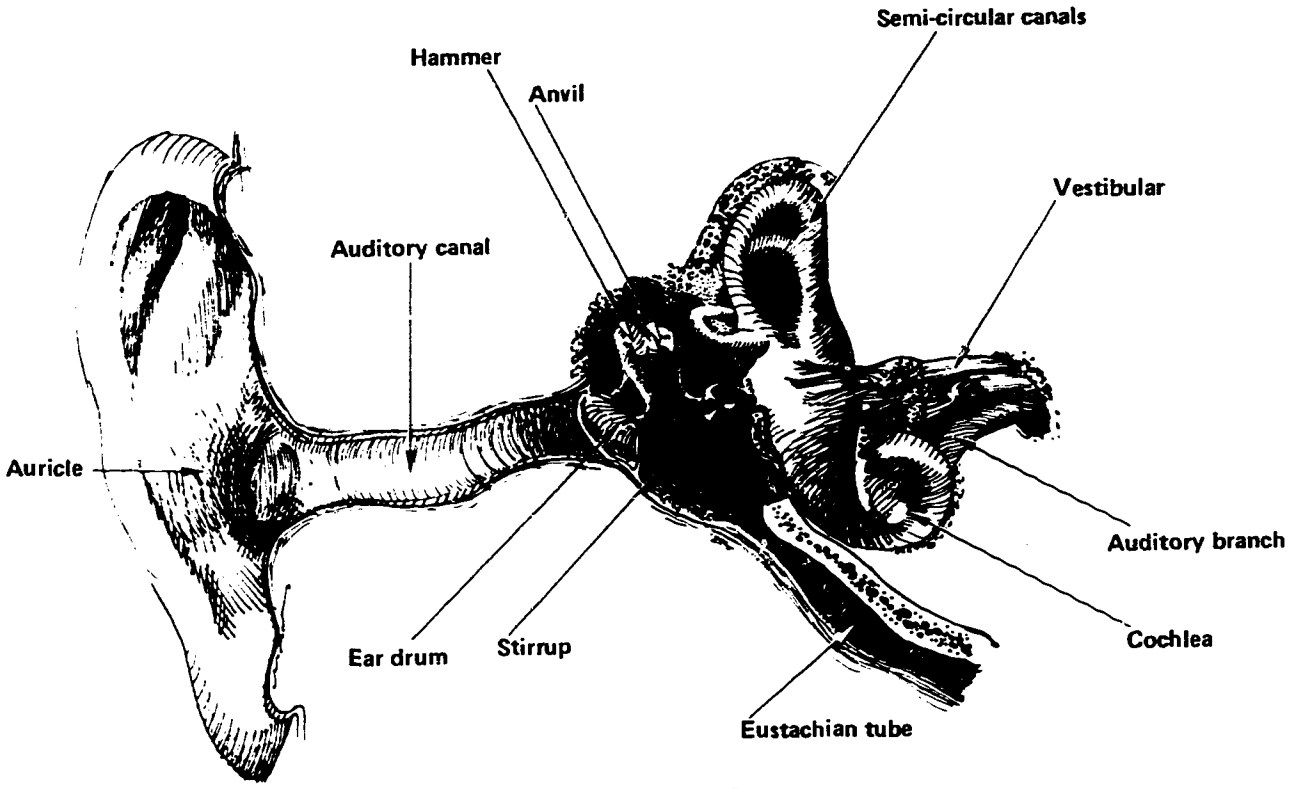
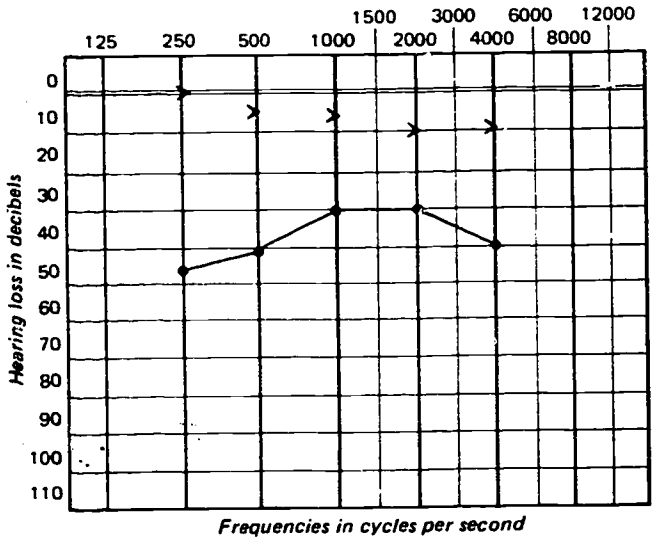


Fig. 3. The Human Ear

A conductive hearing loss is one in which the lesion is located either in the external ear, the middle ear, or both ears. Figure 4 shows a lesion of the middle ear. The audiogram is that of a young child who had a middle ear infection. As is apparent from the figure, the external and inner ears were normal. The audiogram shows an average hearing loss of 33 dB for the frequencies 500-1000-2000 Hz (the so-called speech frequencies). The child had a slight hearing loss.

We can hear by bone conduction as well as by air conduction, and the relationship of the air



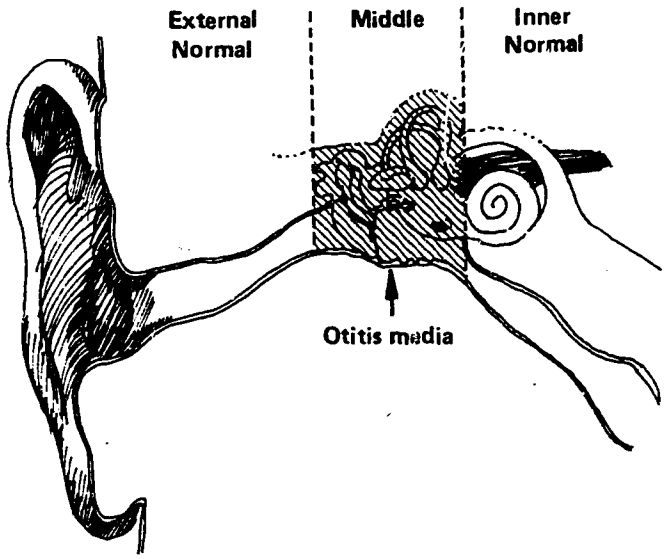


Fig. 4. Lesion of the Middle Ear

conduction threshold to the bone conduction threshold gives us information on the type of lesion. Figure 5 shows the maximum conductive hearing loss that is possible. When the air conduction hearing loss exceeds about 70 dB (ISO), there is sensorineural involvement. The hearing loss and lesion in Figure 5 represent the Treacher-Collins syndrome. The Treacher-Collins syndrome is hereditary. Not infrequently there is microtia and undeveloped external canals and middle ears. The cochlea, vestibular mechanism, and the eighth nerve are usually normal. This observation is very important with reference to the psychological and educational implications of hearing loss.

Another type of hearing loss which is hereditary and usually of the conductive type is otosclerosis.

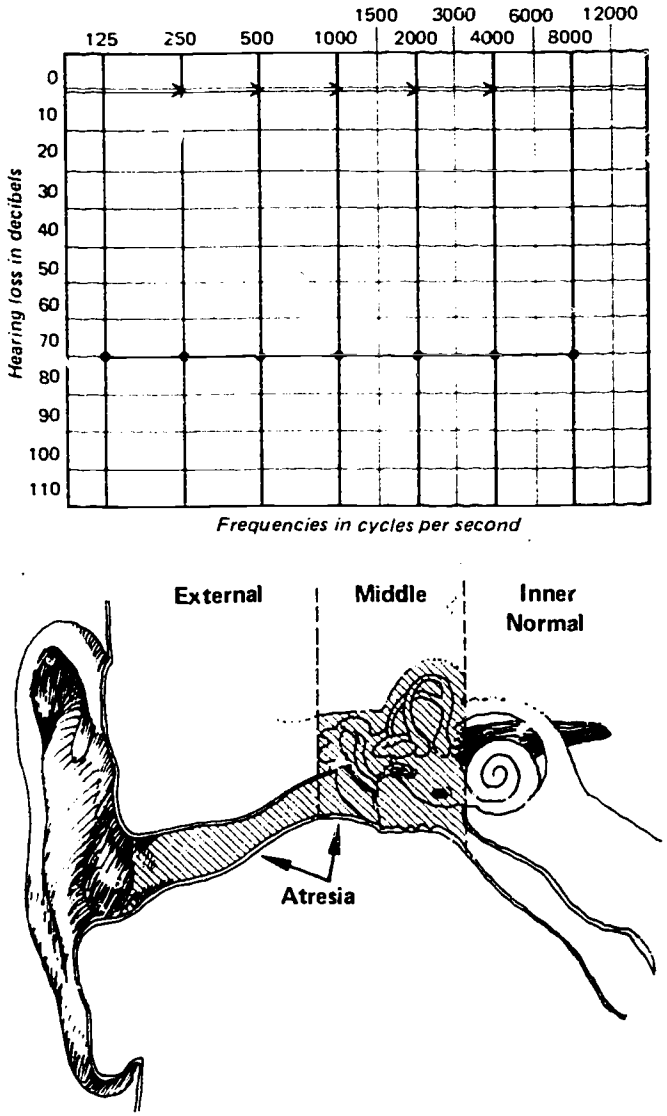


Fig. 5. Treacher-Collins Syndrome

In otosclerosis, the stapes becomes ankylosed or fixed in the oval window. As a result, sound cannot be transmitted efficiently to the inner ear, and thus, a hearing loss ensues. Otosclerosis is a disease of late adolescence (nineteen to twenty years old) or later. It is only rarely associated with childhood.

Conductive deafness results from many causes. Fortunately, conductive deafness can be treated by surgery; this is the type of deafness for which dramatic cures are possible.

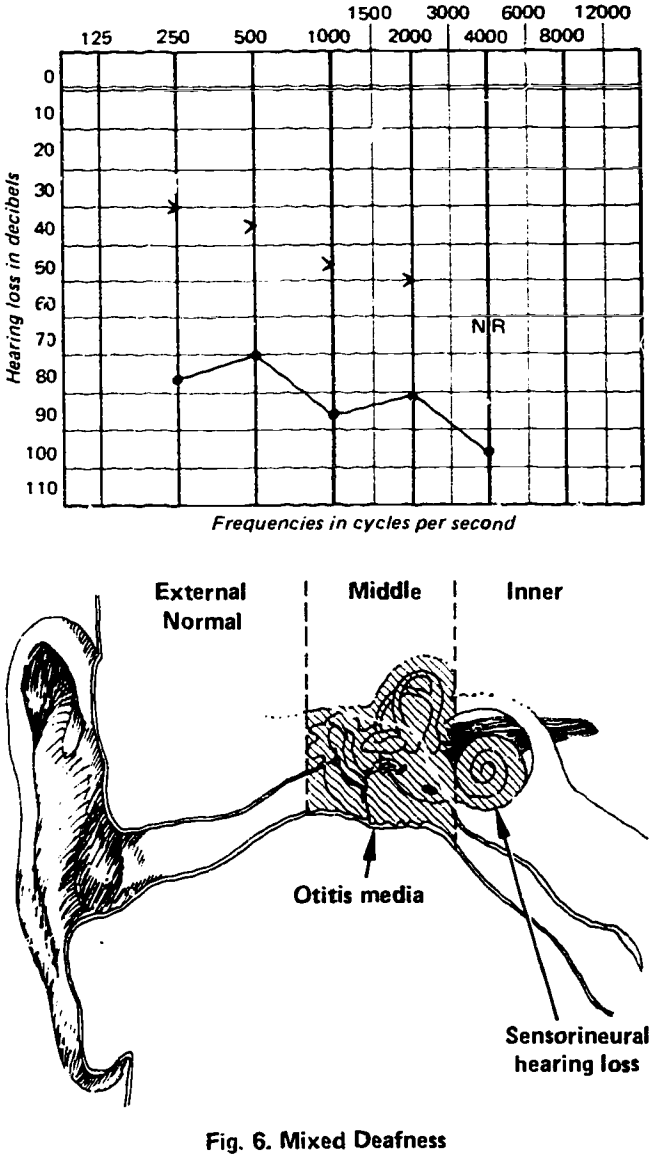
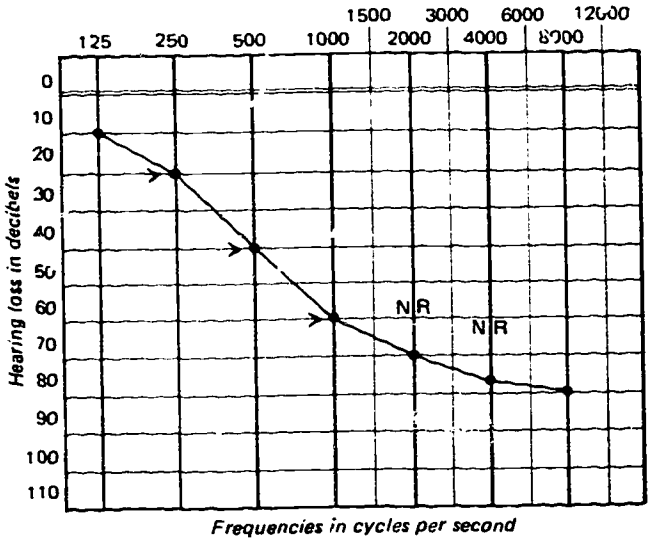


Fig. 6. Mixed Deafness

Figure 6 shows an example of mixed deafness. In other words, the pathological process involves both the middle ear and the cochlea. Therefore, the bone conduction hearing sensitivity is decreased, and the loss of sensitivity by air conduction is

even greater. It is possible in mixed deafness to obtain help from surgery by closing or eliminating the air-bone gap (the difference between the bone-air thresholds), but the improvement will be limited obviously by the degree of sensorineural hearing loss.

In Figure 7 we see the type of hearing loss which is frequently encountered in cochlear hair cell impairment. The loss may range from slight to total deafness. Severe and profound degrees of sensorineural deafness are usually found in schools for the deaf. As may be observed in Figure 7, the lesion is located primarily in the cochlea. The external and middle ears are normal. The eighth nerve is also within normal limits.



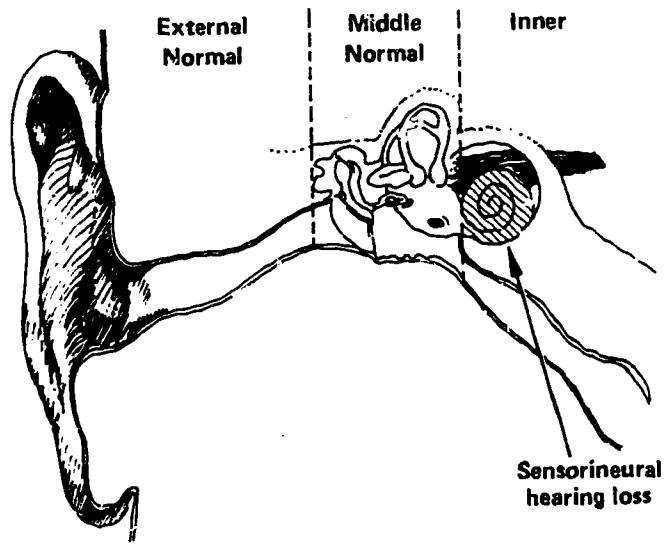
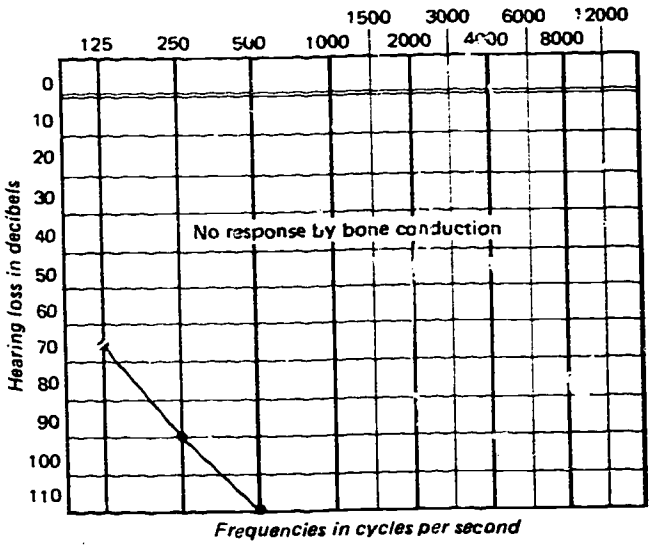


Fig. 7. Cochlear Hair Cell Impairment

Figure 8 illustrates profound sensorineural hearing loss. In this particular instance both the cochlea and eighth nerve are destroyed. This type of deafness is not infrequently obtained after an attack



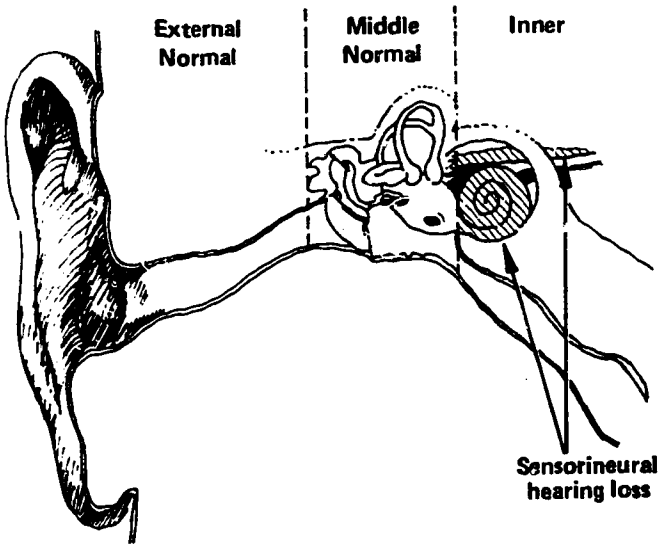


Fig. 8. Profound Sensorineural Hearing Loss

of meningitis. Meningitis was the cause of deafness in a large percentage of children in schools for the deaf years ago. As a matter of fact, meningitis still accounts for a substantial number of children with severe and profound hearing losses. No medical cure is known for cochlear and sensorineural (a combination of hair cell and eighth nerve) deafness.

We hear a great deal today about noise-induced hearing loss. You will recall that I included the 90

dBA noise level with reference to exposure in industry (Figure 1). Figure 9 shows the effects of noise in industry upon hearing sensitivity as a result of exposure over a number of years. Industrial noise unquestionably may cause serious hearing loss but rarely profound deafness. Of course, profound deafness may result from an explosion or something of that nature but not from industrial noise as it is usually understood. The lesion from noise is in the hair cells of the cochlea. No cure is known for this type of deafness.

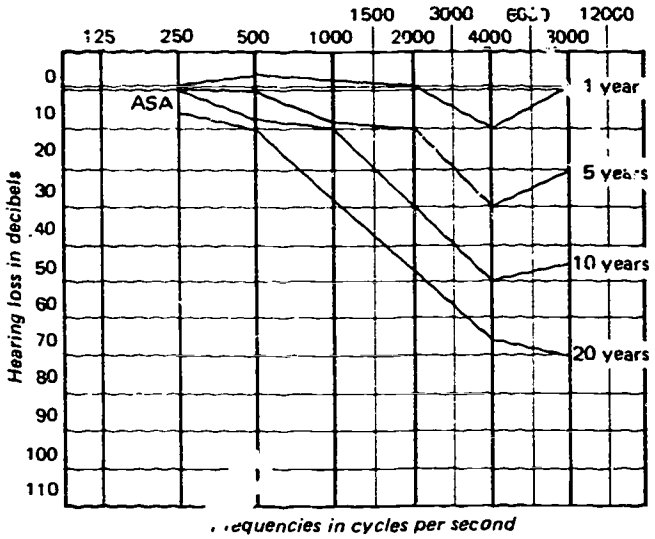


Fig. 9. Result of Exposure to Industrial Noise over Durations of One to Twenty Years

Figure 10 illustrates pure eighth nerve hearing loss. It may range from slight to total deafness. Unilateral hearing loss is frequently found in tumors of the eighth nerve. As a matter of information, unilateral hearing loss is found in 80 to 90 percent of the cases of confirmed (at surgery) acoustic tumors. Approximately 10 to 20 percent of the cases of eighth nerve deafness are bilateral and attributable to von Recklinghausen's disease.

Acoustic tumors develop generally on the vestibular portion of the eighth nerve and, by pressure, progressively damage the fibers of the nerve. It is possible to have normal hearing for pulsed tones, but with no ability to understand speech. The reason for this is that the eighth nerve can still conduct impulses for pulsed tones even when about 75 to 85 percent of the fibers of the nerve have been damaged. However, it cannot continue to conduct a complex pattern like speech.

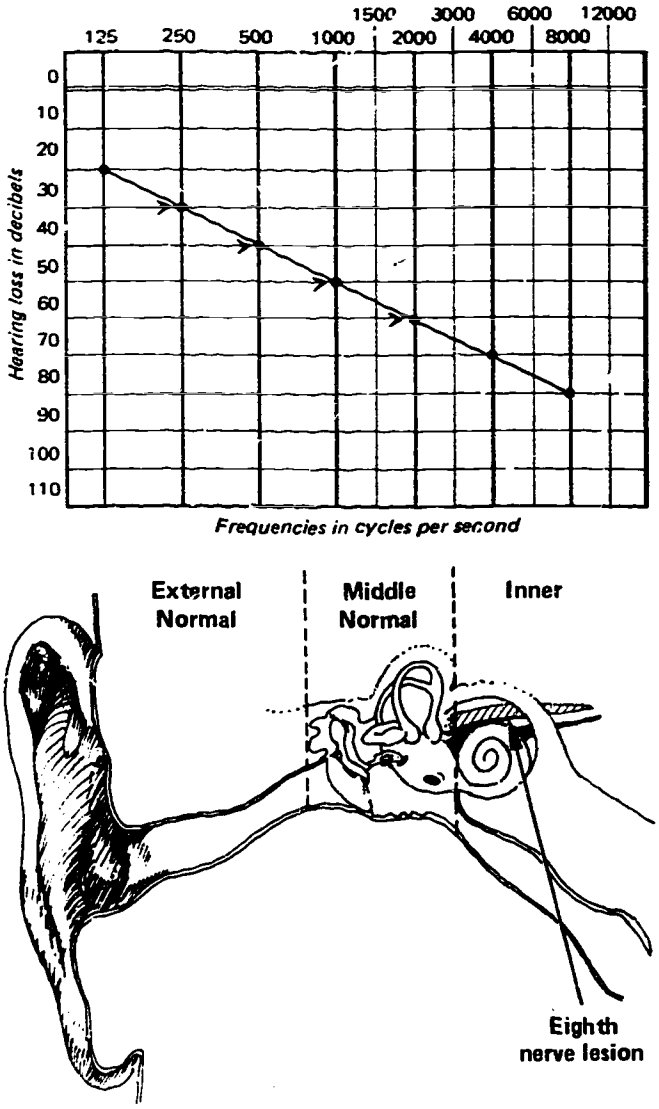


Fig. 10. Pure Eighth Nerve Hearing Loss

So far, I have concentrated upon the degree and type of hearing loss. Perhaps, a few words upon the effects of frequency limitation upon auditory discrimination and the understanding of speech would be of interest. Figure 11 presents data on the effects of high- and low-pass filtering upon the auditory discrimination of syllables, indicating that about 98 percent of the syllables were articulated correctly when all frequencies up to 7000 Hz were passed. In contrast, syllable discrimination progressively deteriorates with each succeeding cut-off of the high-frequency portion of the spectrum. For example, only 27 percent of the syllables was repeated correctly when the frequencies above 1000 Hz were filtered out. Figure 11 provides the same kind of information when the higher frequen-

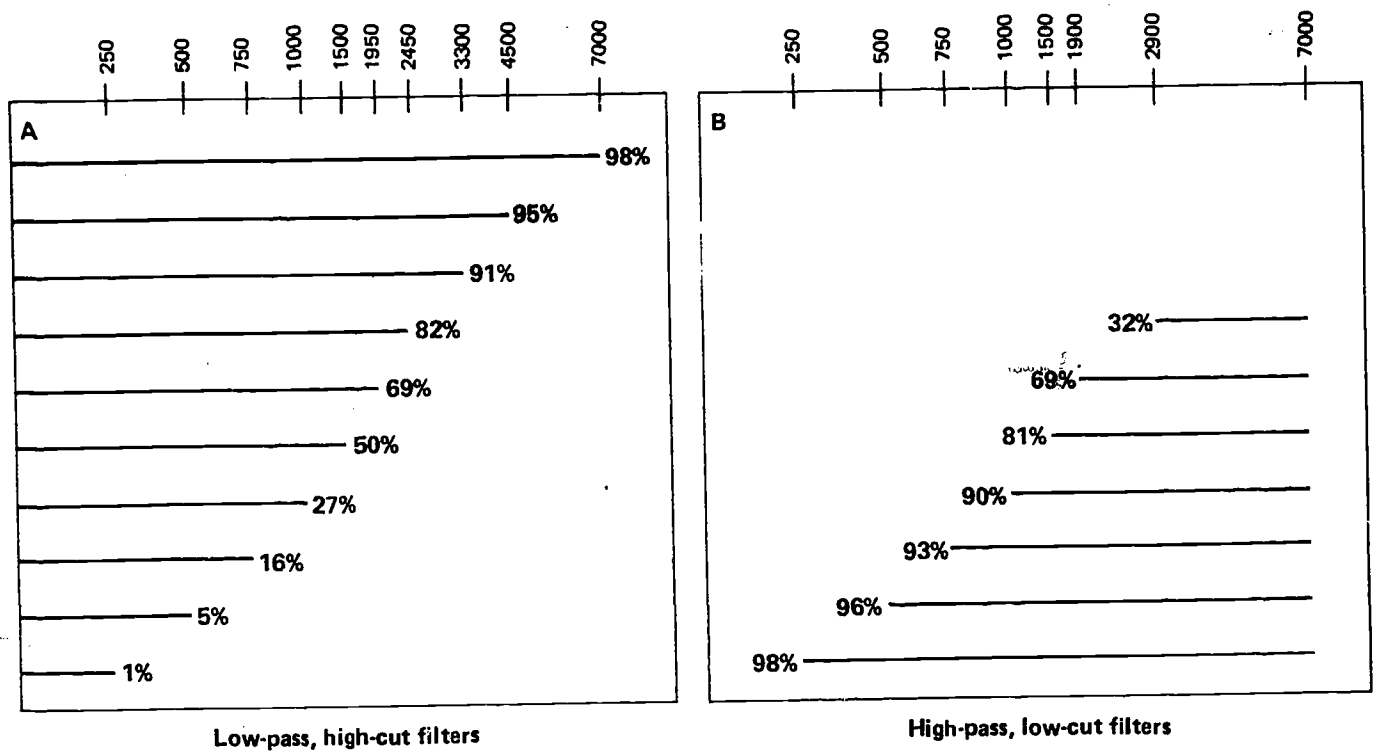


Fig. 11. Effects of High- and Low-Pass Filtering on Syllable Discrimination

cies are passed with rejection of lower frequencies. A and B show that frequencies below 500 Hz contribute minimally to intelligibility for syllables (A shows that only 5 percent of the syllables was heard correctly when the filter rejected all frequencies above 500 Hz; and B, that 96 percent discrimination was obtained when frequencies below 500 Hz were rejected but the remainder was passed.) Interestingly, the band of frequencies either above or below 1900 to 1950 Hz gives an articulation score of 68 to 69 percent. In short, by eliminating all frequencies below 1900 Hz or all frequencies above 1950 Hz, about 70 percent of the monosyllabic words remain intelligible. About 55 percent of the intelligibility is determined by the frequency range 1000 to 2450 Hz inclusive.

Frequency range affects syllable discrimination. However, its influence will be modified by the type and familiarity of the material, the recording, and the articulation of the speaker. These data have implications relative to children with high-frequency loss.

Specifically, children who have normal hearing out to 250 or 500 Hz will respond to low-frequency sounds. Yet their impairment for the speech frequencies is so serious that it retards the development of language if the hearing impairment was congenital or occurred before the acquisition of language. These children are frequently diagnosed as aphasic, retarded, or emotionally disturbed when in fact they have a precipitous hearing loss with normal sensitivity in the low frequencies.

Psychological and Educational Implications

If a child has a hearing loss which lies between 0-25 dB in the better ear, measuring any deleterious psychological impact is difficult. However, when hearing loss in the better ear reaches the slight classification range of 25-40 dB, definite lags in language development and emotional adjustment become apparent. Pintner and Lev in 1939 conducted a study of more than 1,100 children with hearing impairment in the New York public school system. They found that children with hearing losses between 25-40 dB ISO (15-30 dB ASA) were retarded by eight points on a verbal IQ test but were normal when tested with a nonverbal IQ test. As a result of this finding, they recommended the use of nonverbal tests with hearing-impaired children. The deficit of these hard-of-hearing children on the verbal test was more than likely due to the impact of the hearing loss upon language acquisition rather than to factors associated with a lack of reading skills. In short, if perchance the hearing impaired children were less skillful in reading, it was probably related to an underdevelopment in

language contingent upon the hearing loss. I have reached this conclusion after conducting several studies involving children with small (slight) congenital sensorineural hearing loss. Hearing losses of the aforementioned type and degree usually cause a language retardation of a year or more at age three. These children do, of course, develop language, but it is not infrequently retarded and may remain so unless they are given specific help. Given appropriate remediation, there is no reason why they cannot be successfully educated in the conventional school classroom.

Pintner and Lev also found that their subjects (the hard-of-hearing children) were less well adjusted than normal hearing children, even though in some instances significant differences could not be demonstrated. Furthermore, in 1964 Goetzinger, Harrison, and Baer reported that children in the public schools with slight sensorineural hearing losses showed a higher incidence of introversion, poor work habits, emotional variability, and shyness in comparison to their hearing controls, as determined by school records.

Fisher, in England in 1966, also reported poorer adjustment for children with slight hearing losses in comparison to normal hearing children.

When hearing loss in the better ear reaches the 40-55 dB category, psychological problems on the average are measurable, both with reference to adjustment and to education. The use of hearing aids or amplification is indicated. Even though the propensity to psychological problems is enhanced with this degree of loss, the majority of these children should be able to succeed in the regular public school classroom if appropriate psychological and educational help is provided. At times, however, placement in a classroom or program for hard-of-hearing children may be indicated but not in a school for the deaf.

When hearing loss lies within the marked classification (55-70 dB) educational retardation will result if special services are not provided. In addition, emotional problems resulting from the hearing impairment are magnified. Many children in this classification, particularly if the impairment is congenital and sensorineural, will require special classes for the hard of hearing in the public schools if they are to be educated and developed to their inherent capacity.

As mentioned previously, children with hearing losses in the better ear which are at the 70 dB level and greater are considered to be educationally deaf. This is particularly so if their losses are congenital and sensorineural. The child who is educationally deaf acquires language and his education primarily through the visual channel, despite the use of hearing aids. The current population of children in schools and classes for the deaf, according to the *American Annals of the Deaf* (1975), is 53,009. Within the last few years, a strong movement has been underway to mainstream the educationally deaf into the regular public school classroom. While such an effort may seem laudable from the viewpoint of some sociological speculators, it hardly seems logical or practical from the standpoint of professionals who are in a position to observe the problems encountered by children with mild and marked hearing losses, and in particular, the efforts of public school administrators and teachers to railroad such children into schools for the deaf.

In 1948 I did a study of the intelligence and achievement of more than 100 deaf adolescents in a western school for the deaf. At that time, as well as now, this particular school is rated as one of the foremost educational institutions of the deaf in this country. The average IQ on the *Wechsler-Bellevue Performance Scale* was 100. Yet at age seventeen and a half years, their average paragraph meaning and vocabulary scores, as measured with the *Stanford Achievement Test,* were at the 4.2 grade level. A recent (1975) study of deaf children in the state of Massachusetts reported an average paragraph meaning score (grade level) of 4.2 at age seventeen years. Apparently little if any progress has been made in the intervening years in teaching deaf children language as indirectly measured with the aforementioned tests. In fact, for those of you who have a penchant for history, I might add that the progress since the early work of Pintner and Paterson, and Reamer (the period of 1915 to 1930) has been incredibly disappointing.

I have spent more time in discussing the hard-of-hearing child than the deaf child, primarily because we have more hard-of-hearing children than deaf children. You will be required to make a judgment as to their educational place and need to know the implications of the type and degree of hearing impairment upon psychological development and educational progress. Table 1 summarizes essentially what I have said. I hope that I have been able to provide you with some helpful information.

Table 1. Classifications of hearing handicap. The hearing levels are the averages of 500, 1000, and 2000 Hz in the better ear relative to ISO and/or ANSI and ASA reference levels.*

ISO ANSI Decibels	ASA Decibels	Handicap*	Speech understanding*	Psychological implications	Hearing aid need**	Pittsburgh, PA. study of 4,064 subjects for C.A. 5–10 years
0	–10	None	None with both ears within this range.	None	None (the CROS with unilateral cases at times)	Number in class was 3,996 (98.3 percent)
25	15	Slight	Difficulty with faint	Children may show a slight verbal deficit.	Occasional use.	Number was 36 (0.9 percent)
40	30	Mild	Frequent trouble speech at one meter (SPL 65–70 dB).	Psychological problems are measurable in children. The beginning of social inadequacy in adults.	Hearing aids are often needed.	Number was 19 (0.5 percen
55	45	Marked	Frequent difficulty with loud speech of about 85 dB SPL at one meter.	Children usually are retarded educationally if they are not given special help. Emotional and social problems are frequent. Psychological problems are measurable in adults.	Generally, the area of greatest satisfaction from a hearing aid.	Number was 9 (0.2 percent)
70	60	Severe	Might understand shouted or amplified speech, but this will depend upon such other factors as type of loss, and so forth.	Congenitally and prelingually deaf children usually show marked educational retardation. Emotional and social problems are observable in children and adults.	In general, good results, but benefit depends on many factors such as auditory discrimination, recruitment, and so forth.	Number given as 2 (0.05 percent). It includes the "extreme" class.
90	80	Extreme	Generally, no understanding of speech, even amplified speech.	Congenitally and prelingually deaf may show severe educational retardation and emotional underdevelopment. Deafened adults may have personal and social problems.	Help from hearing aid depends on objectives. Lipreading, voice quality, and so forth are often improved.	

Note: *Modified from Davis and Silverman (1960) and Eagles (1968) references.
**Modified from lectures by Dr. Raymond Carhart.

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Psychological Aspects Related to Psycho-Diagnostic Evaluation of Blind Children

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When conducting a psychological evaluation of blind children, one must be aware of many aspects which are not unique to blindness but which tend to be prevalent among that group. No personality characteristics are unique to blindness, yet we must acknowledge that some characteristics are more prevalent among the population of the blind and the visually handicapped than among a comparable population of seeing children and adolescents. Unfortunately, in the language of those working with the blind or associated with them, the term "blindism" remains. Blindism is the most erroneous word in popular usage among those working with the blind. Properly, the term should be "mannerism," because we have yet to identify a blindism that cannot be found among a population of neurotic or psychotic seeing children and adolescents. Autistic children exhibit manneristic behavior because they are rejecting stimuli from their environment. Congenitally blind children exhibit similar manneristic behavior because they have not learned to utilize stimuli from their environment.

The congenitally blind child and a significant proportion of children blinded before the age of five are, as a rule, overprotected. They are kept in their cribs or playpens with minimal stimulation. The seeing infant has a jungle gym dangling in his or her crib and a mobile hanging above it. These are visual stimuli to encourage appropriate development of early psychomotor activity. But when parents know a child is blind, they don't expect the child to respond.

As soon as a seeing child shows signs of mobility in the playpen or crib, the child is generally permitted to crawl and move about on the floor. When blind children show evidence of crawling behavior, they are confined to the playpen so they won't bang their heads on a chair leg or a table leg. Seeing children bang their heads against tables, chairs, and other objects, but the blind child is not permitted to do so. As a result, the bodily movements, mobility, and orientation of the blind children are poor or nonexistent. Their posture is rigid, their orientation is poor, and their motion incorporates a constant avoidance attitude.

Many people working with the blind do not consider the quality of perception of the congenitally blind person or the person who is blinded before the age of five. If I hold up a chalkboard eraser, you can see only three sides of what is actually a six-sided object. Through visual development you can project the other three sides but you can see only three. However, the blind person who looks at this eraser can see all six sides at one time and he cannot comprehend how you can see only three sides. If I ask you to close your eyes and visualize the room in which you are sitting, you can do so with varying degrees of success. Each of you who sees can produce such an image. This cannot be done by the person who has not seen or who was blinded before the age of five. We who do see have a structured visual imagery. The person who has never seen and the majority of those who never saw after the age of five do not have this capability. The difference is significant.

This does not mean that those congenitally blinded or blinded early in life cannot develop a construct. They do, but where our construct and that of those blinded after the age of five have a structured or gestalt form, the construct of the congenitally blind is organized in terms of a tactile and kinesthetic, lineal, and temporal continuum. Their tactile and kinesthetic impressions are organized in terms of time and sequence. If one of these persons went to a woodworking shop to build a table, he would have to be shown how to construct each piece individually and would not have a concept of the whole until the table was completely assembled. The seeing and those blinded after the age of five and retaining a visual imagery have the capability of conceptualizing mentally the whole and breaking it into its component parts. The congenitally blind and those blinded before the age of five must have the component parts assembled into the finished project before they can conceptualize what that project is.

When asked to evaluate a visually handicapped child, all too often one lacks information concerning his visual acuity. Yet that information has an important bearing upon the interpretation of the instruments which are used for the diagnostic examination. Fortunately, we do have a simple yet sufficiently accurate mode of measuring visual acuity on a functional level which is often more meaningful than an ophthalmologist's refractured measurement. This is the *Flash Card Test of Low Vision* that has been adapted for use with legally blind but visually oriented children by the New York Association for the Blind. Its utilitarian value should make it a must for use by all psychologists who are conducting psycho-educational diagnosis of the visually handicapped.

Very shortly after beginning to work with the blind and the visually handicapped, I recognized the futility of using standardized measures of learning ability with applicants for admission to kindergarten or the first grade. The very significant majority of this group of youngsters had not been provided with sufficient learning stimuli to prepare them to be measured by such standardized instruments. Simply by reviewing the collected available material, I found that within a year of successive testing such children advanced anywhere from 10 to 40 IQ points. The practice of preadmission testing was abandoned. Instead of testing we use the *Maxfield-Buchholz Social Maturity Scale*, and through interviews we endeavor to determine the degree of language function that the child has achieved. No child is administered a formal test of learning ability until he or she has been exposed to the learning process for at least six months.

The primary tests of learning ability utilized are the *Wechsler Intelligence Scale for Children-Revised* (WISC) and the *Wechsler Adult Intelligence Scale* (WAIS). With totally blind persons, only the verbal scales are used. With youngsters who are functioning visually, we use both scales, omitting only the picture arrangement subtest. I have found that these tests can be used with young people whose visual acuity is as low as 5/200. Many psychologists using this test will ask, "What do you do with the time limit?" I have found the time factor to be important only in the coding subtest. I have taken the liberty of extending the time span for digit symbols from two to three minutes which is consistent with the research, increasing time limits in achievement testing with large-type materials. I get very upset when I hear people say that although it is possible, for example, to administer the performance scale of the WISC to visually handicapped children, this should not be done because the children would be penalized by the time limits of the various subtests. Anyone who is conducting a psychological evaluation has the responsibility to obtain as much information about the learning abilities of his or her subjects as is possible. Anyone who feels that he or she should not use a diagnostic instrument because time limits may penalize the subject should not be in this business. The responsibility of the person administering the test is to the subject, not to the person who wrote the manual for the administration of the test. When necessary, disregard time limits.

When working with visually functioning legally blind subjects, I have become very comfortable with the use of the Wechsler performance scales, the Bender-Gestalt *Bender Visual Motor Gestalt Test*, and the *Goodenough's Drawing Test* as well as the *Peabody Picture Vocabulary Test*. They are all available, they are usable, and you do your subject a disservice if you do not use the complete battery. With subjects of any age who do not have useful vision, we use the Wechsler verbal scales.

The instrument most useful with young blind children is the *Blind Learning Aptitude Test*, by T. Ernest Newland of the University of Illinois. This is an embossed test which incorporates the measurement of six different functions. The first two involve tactile perception and cognition. The third function requires concept development. Three stimuli are presented and the subject must identify the fourth from a field of five choices. The fourth task requires the development of the concept of a proportion task. The fifth requires the completion of a matrix and the final task is the identification of one figure to complete a two-dimensional set. Thus, the test identifies perception, cognition, and four levels of conceptualization related to tactile perception. This test is available in limited quantity from the American Printing House for the Blind to competent psychologists who will be prepared to report data back to that organization for better standardization of the materials.

Any of the sentence completion tests are also valid for use with the blind and visually handicapped. With young children, I have felt very comfortable with the use of the *Despert Fables Test*. The *Auditory Apperception Test* is available in limited quantity. In addition, evidence validates the use of the manual descriptions of the plates of the *Thematic Apperception Test*. I have used this test and feel that it has been a very meaningful instrument.

We cannot disregard the vocationally-oriented instruments. For several decades the *Kuder Preference Test* has been used for college-oriented students. Only within the past two years have we had vocational interest inventories standardized upon noncollege-bound students. One of these is the *Minnesota Vocational Interest Inventory* (MVII) and the other is the *Ohio Vocational Interest Survey* (OVIS). Through careful examination, I found that the MVII is utilitarian with visually handicapped students, but the OVIS has many characteristics that make it difficult if not impossible to administer in its entirety.

Three tests of manipulative ability have been standardized upon blind and visually handicapped populations. One is the *Minnesota Rate of Manipulation Test.* This test is useful both quantitatively and qualitatively; a test of learning ability as well as a test of manipulative ability. For totally blind subjects it becomes a test of spatial orientation. Many subjects have difficulty with orientation. With these subjects, I use the test to find out if and how they can learn to orient themselves to the board. With both blind and visually handicapped subjects, I have also found that the test provides meaningful information via the turning task as to the possibility of brain damage.

The *Pennsylvania Bi-Manual Worksample* is equally useful. It is a two-hand coordination task that also depends upon orientation in a small space. It has both qualitative and quantitative value. The third of the series, the *Crawford Small Parts Dexterity Test* (of which only the screwdriver task has normative data for the blind and visually handicapped), is a very useful and meaningful instrument. I once felt that if subjects could not perform the *Minnesota Rate of Manipulation Test* or the *Pennsylvania Bi-Manual Worksample,* I should just disregard the *Crawford Small Parts Dexterity Test.* However, I have subjects who do poorly on the first two and then do a better job on the third, even though it is a finer and much more discreet task. The moral of this story is: If you want to have a full evaluation of a blind or visually handicapped subject, be sure to give him every opportunity to demonstrate all of his abilities.

At this point I would like to refer to the *Perkins-Binet Test of Intelligence for the Blind.* The Perkins-Binet was standardized upon a population of 2,200 blind and visually handicapped school-age students. It consists of two forms: Form U for subjects with usable vision and Form N for subjects without usable vision. It is a typical Binet scale, but it has the added advantage of comparing the performance of the typical blind or visually handicapped subject with his seeing peer. A doctoral candidate at Peabody College for Teachers compared the Perkins-Binet with the *Wechsler Intelligence Scale for Children–Revised* (WISC). The Perkins-Binet test for nonvisual students and the WISC had a correlation of 0.86. The Perkins-Binet for visual students had a correlation with the WISC of 0.74. These are very good correlations. However, the standard deviation of the Perkins-Binet test was significantly higher than the standard deviation on the WISC in each of the tests. This suggests that scores of the Perkins-Binet should not be considered interchangeable with those of the WISC. As I mentioned before, the greatest value of the Perkins-Binet is its ability to describe to what degree and in what areas the visually handicapped and blind student differ in developmental levels from the seeing subject. Hopefully, this test will be marketed within the next year.

When you are conducting a psycho-educational diagnosis of a blind or visually handicapped student, use every means available to find out as much about that student as you can. Do not feel constricted by the publisher's limitations on the utilization of test instruments. Take time to assess the realism of your subject's verbalizations. Be careful to differentiate qualitatively between the function of the congenitally totally blind and that of the adventitiously totally blind youngster on nonverbal tasks and, above all, in your interpretation of data and tests of learning abilities. Forget about IQ. The greatest injustice wrought upon American school children was the invention by Terman of the IQ. This pertains to seeing, blind, visually handicapped, deaf, physically handicapped, or whatever the disability or nondisability. An IQ does not describe a child's learning abilities. Educators, administrators, teachers, and school committeemen have all seized upon this classification device, and it is all too frequently used to unjustly classify children. As psychologists, your job is to describe your subject's abilities. An IQ cannot do that. If school administrators require it, I suggest that you make certain that they have to read through a full description of your subject's abilities before they can find that IQ. Don't always put it in the last paragraph or they will just look there. Move it around. You may have to present it, but make them hunt for it; and make sure that they learn about the child before they find that number.

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Assessment of the Deaf-Blind Child in the Public School

Presented by Carol Whiting
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I am going to tell you a little bit about myself, not because I am special, but because I consider myself a pretty ordinary person, within one standard deviation of normal most of the time. Because I am like a lot of other people, maybe you will experience some similar things.

I am a school psychologist in the Bay Area. For about five years now, I have worked exclusively with the blind, deaf-blind, deaf, hard of hearing, and children with severe oral language handicaps. I work with 200 children ranging in age from three years to twenty years in a large school district with about 60,000 children.

I got into the field through no special interest, but through a need for money. When I was in graduate school I saw a "deal" advertised on the bulletin board in which graduate students could be paid $600 and receive six units of credit if they enrolled in some courses offered for the blind. I figured this would apply towards my degree and credential as well as being profitable. They were interesting classes, but when I was through I figured that was that.

When I got out of school, I wanted to stay in the Bay Area, especially Berkeley. At that time only one job was available in the area and that job was at the School for the Blind. I think they hired me because I was the only psychologist who had even taken any courses relating to the blind. I took the job because it was in the right location and I needed the money.

The first day at the school, I spent the morning with deaf-blind children, but did not recognize any overt effect. I rarely go out for lunch, and never go alone. However, that day I went out to lunch and I went alone. I almost never drink hard liquor, but I had three martinis that day before I realized my lunch hour was over. At the end of the day, I drove down to Telegraph Avenue and charged $300 worth of fur rugs, incense, candles, mirrors, and mobiles to my Bankamericard. What I had done was to dull my experience with liquor and then try to compensate by supplying myself with a lot of sensorially stimulating objects. It took me a little while to recognize the full impact of what the sensory deprivation of these children had done to me. As I look back, I think that I probably identified with them, or maybe there was some fear on an unconscious level of "catching it" and becoming handicapped myself.

During those first few months, still fearful of too much close contact, I focused on lengthy interviews with the parents or the teachers or culled past records—doing anything to avoid actually relating to the child. I frantically looked through all kinds of books and catalogs, wondering what the various materials for the children were like. Collecting tests became a hobby for me.

From my experiences, I have some suggestions for you. The severely multihandicapped, especially the deaf-blind, can be a very seductive type of person. You can get so involved in your work, or at least I can, that you have to be careful or your social life becomes nonexistent. There is something about these children that gets to you. There are "different strokes for different folks," and working with children is not everybody's bag, but let me tell you how fascinating this work can be when you get past your own personal resistance or hang-ups.

You are seeing children at early levels of development, like Piaget's sensory motor or Erickson's establishing-basic-trust stages, that you don't ordinarily work with. You are right there at the beginning of a person. You learn more about how a child grows and matures than you can learn anywhere else that I know about. Once you are able to be comfortable with a deaf-blind child and find your own way of relating to that individual child (because it is going to be different for each child), you will find a renewed acceptance and understanding of all the differences generally found in our society.

I suggest diving in and eating with the child, toileting the child, getting down on the floor. All this will help you overcome some of the things that

happened to me. Maybe you have already done this, but I believe it is a new experience for many psychologists. It is definitely worth investing your time and energy. I discovered new flexibility, imagination, and creativity, and I feel expanded as a person by working with the children this way. What I see, as I look back, is that as you shape the child, the child shapes you. For example, I have been working most recently with deaf children, and I now find myself facing people directly in social conversations, with continued eye contact. I don't think that I did that much before. It seems as though I laugh and gesture more extravagantly. I find myself wearing a distinctive perfume and more colorful, textured clothing. I think I am generally much less inhibited than I was before. And I feel I have a much deeper and fuller appreciation of life and the joy in it. It has been a wonderful experience.

Now, let's talk about testing, observations, and report writing. In California every three years we have a total reassessment of every child in a public school special education program. At our school, the evaluation team consists of a school psychologist, an audiologist, nurse, speech therapist, teacher, and administrator. We are fortunate to have a complete audiological booth at the school. We have painted it with fish and things on the outside because otherwise it looks a little bit like a gas chamber and can be frightening to both children and adults. We present our results and our recommendations, along with the educational plan or prescription, to our district admissions and reevaluation board, which consists of a psychologist, nurse, speech therapist, teacher, and administrator (no audiologist).

I find it very helpful to use five-minute videotapes of our deaf-blind children. That takes a lot of time, but it is very effective. Parents like to look at these, too, and so will the child who has sufficient vision. I use such scores as the WAIS score and test ages in various subtests to measure the child's performance as an individual, so I will know the child's progress and rate of development in a testing situation. We can only measure each deaf-blind child as an individual; there are no other comparison standards or normatives for deaf-blind children.

I prefer not to observe or test a child until he or she has hearing aids. (I also like to have goals in life which I never quite reach, and this is one of them.) I always note in the report whether or not the child was wearing a hearing aid or aids, and on which ear, and whether the child was wearing glasses. I always check the hearing aid myself. The ear mold may have ear wax in it, the batteries may not be working, or the child may have turned it off. Some children may even turn their hearing aids off during testing. Generally, in our program, the teachers have had a lot of inservice training in audiology. They have checklists and are supposed to check the children's hearing aids every day, but this doesn't always happen. It's very embarrassing to reach your conclusions and right after reporting them wonder whether or not the child's hearing aid was working. That's why I check the aids rather than take somebody else's word for it. Another rather embarrassing situation (and a time waster) is to have a referral made to you of a child who is deaf-blind, who has become a behavior problem, and who is very angry and acting out. After some time you discover that the child's hearing aid is broken in some way. The minute it is fixed, the child is no longer angry or a behavior problem. So always check those hearing aids first to make sure what's happening there.

I bought a Toyota Chinook this year. I call it my psychmobile. It's very handy, because I firmly believe that you have to see these children and work with them in the home as much as possible. I recommend a mobile unit. You can deduct part of it in taxes, and you can carry many supplies in it.

I have found that working with the child at home in front of the parents has great advantages and is a time saver. It saves time later when communicating with those parents. Issues become more real for them. Working with the child when parents are present means that everything is going on in front of them and the points get across. The parents learn what you're looking for and what to look for themselves in the development of the child. I have a much better picture of the family and what they're experiencing and how they are relating.

Obviously not every home has a lot of privacy or is an ideal situation. I have on occasion found a home in which I was unable to work. I learned that noise and confusion don't get to me, but really unpleasant odors do. At that point I will work outside in the yard or in my car. I usually work some in my car anyway, and I have a table and benches in there. Once again, you have to get back to developing your own flexibility and feeling secure in your relations with the child. Each child is different.

Generally, while I am talking with the parents, I let the child go through a few toys that I have with me. When the child finds a "favorite" toy, I make a

mental note of it. If he or she is the kind of child with whom I can sit and do some kind of formalized testing, the toy is a helpful tool. I keep the toy in my lap during testing. As I remove one set of blocks or subtests, which the child may not want taken away or when the child resists the new one, I'll pair the favorite toy with the new set. As the child gets involved in the new activity, I gradually remove the toy.

Always be alert to the child's ability to hear or see things that prior reports suggest the child might not be able to see or hear or do. It's very difficult to get accurate ophthalmological, audiological, or psychological test results. Even when a child's vision and hearing seem to be defined accurately, there may be a wide range in ability because of the child's motivation and general health. We all recognize that our own hearing and vision are selective and they vary with different days, moods, and settings. Discovering some kind of progressive loss is always a possibility. When evaluating the child, keep in mind the need for establishing a base with which the child can be compared in individual performance later. You are free to be innovative, but you do have to be careful about noting exactly how you used the evaluation materials. You may use only part of a test or extend the timing, as long as you note all of these variations in your report. On each reevaluation, fewer questions will remain unanswered. On the first evaluation you may be able to define only the questions that need to be asked. You may not come up with a totally definitive diagnosis, but many times neither do the audiologist or the ophthalmologist. Unless you know definitely that you're writing the report for one particular person (and I've never had that happen), write the report in everyday language so that an average high school student could read it. Some reports require terms like "otitis media," "stereognosis," or "dysarthria." What I do is define them. I say, for example, "The child has a middle ear infection (otitis media)." In other words, I put the unfamiliar or technical term in parentheses and put the definition in lay language. I try to encourage the ophthalmologist and audiologist to do this also, because then it becomes a learning experience for everyone. It does take a little thinking, sometimes, to sit down and put those terms into simple language. And as I said, it is a goal I am still working towards.

I like to think of the child in terms of strengths and needs. Sometimes we say "strengths and weaknesses," but I don't like the word "weakness." I would like to boost it up, away from the negative—from "weakness" to "needs." I also tend to stay away from the word "blindism." A "blindism" is a self-stimulating mannerism (like rocking) that may be an attempt for the child to find a location in space or it may be the child's effort to supply self-stimulation when he or she is not getting enough of it in other ways. This rocking is seen also in autistic children. The objective is to describe the child's mannerisms, not label them.

Another thing I think about is: What kind of question is this child asking about self or environment through his or her actions? This makes a very fascinating and challenging task. (Sometimes I feel like a real detective, and I think if I had another life maybe that is what I was.) Consider some of the questions a child could be asking through mannerisms and actions: Can I trust? Do I exist separate from my mother? What is mine? What is somebody else's? Why am I different? Of course, each child has personal questions, and when one question is resolved the child generally goes on to another one. That's what development is about. It is also true, I believe, in adults. I know that I am still working on my own question, and I'm always trying to figure out what I'm acting out through my behavior.

I think that one of the best attributes that a person can have when writing a report is the ability to see a person or a personality in the deaf-blind child. Sometimes, no one else has recognized that personality. Sometimes, when you can find the personality or person there, the parents and the teacher will be able to see it, too, and the child blooms in an environment in which he is viewed as an individual. I think this is one of the greatest services we can do.

A personal bias I have is including personal feelings and impressions in reports. I think we have the right to do that when they are labeled "personal impressions." These impressions are especially important with regard to the deaf-blind child. How did you feel in the child's presence? It means exposing yourself as a person, and I suppose anybody who reads my reports knows something about me, too; but that's OK. Your impressions may give someone else a head start or insight in dealing with that child. Too, if the child changes on reevaluation, you have more information.

I would also like to see some part of the report written in a narrative fashion. I have always dreamed of the perfect psychological report that is so interesting that you read through it like a short story and then are so intrigued and mystified that

you want to go directly to that child and find out more about him or her for yourself and then work with that child. I have even gotten to the point that I double space my reports, thinking that might be easier on people's eyes.

An important part of any evaluation is an estimate of the deaf-blind child's potential for communication or language. This depends on so many things: the degree and the type of hearing loss, when it occurred, when the child received first amplification and whether this amplification was appropriate, how well and how consistently the child wears his or her amplification, the amount and the type of remedial training, and also the family.

I see many children with similar degrees of congenital hearing loss who received their aids early and wore them consistently. The aids were appropriate, but some of the children are acquiring much more speech than others and much sooner. The difference may be due to conditions within the family: Are the family members talkers? Do they value speech? Are the messages the child receives at least 51 percent nourishing or more pleasant than unpleasant? Does the mother or father mutter? Does the father's mustache cover his lips? Does the child get more attention for not having speech or does the child *think* he or she gets more attention for not having speech? Do the parents really like the child? Does the child like them? Are the messages consistent or the double-blind type? How about the frequencies in the voices of the mother and the father and the quality of their voices? Are the parents so anxious that they are pressuring the child? Is the speech in the family only a cover, with the real message being transmitted in some other way? I have had conferences with parents whom I have certainly wanted to tune out. We've all talked with people to whom we don't want to listen because there is something unpleasant in the message and the quality of delivery. Why wouldn't a deaf child also decide that there was no need to use residual hearing to tune in to a particular voice?

Earlier I mentioned that IQ scores are not the most relevant issue, and neither is mental age. You can say the child is functioning at a two-year level, but I think people want something more and they need something more. I like to divide my approach to the child into five different areas. This is not unusual; most of you probably do this, too. The five areas are (1) the social and emotional development of the child, the affective development; (2) (these are not necessarily in order of importance) the cognitive development, including language which is a later branch of cognitive development; (3) self-help skills; (4) survival skills, or adaptive behavior; and (5) sensorimotor integration. The developmental *levels* you identify may be quite different in the various areas.

As I mentioned earlier, when I first started working with the children, I couldn't find enough tests. I went through catalogs; I went through books; I went through closets; I went through other people's reports. Finally I took all of the information and sat down four or five nights in a row and made what I call an outline for a deaf-blind psychological evaluation (see Appendix A). I'm only giving this to you because it was helpful to me. It is a place from which you can start, but I certainly think you can add to this. Each deaf-blind child is so unique, with different levels of hearing and different levels of sight and different potentials for learning. It's very intriguing.

Among the deaf children I'm working with now, we are discovering that a lot of them are having vestibular difficulties. They like to spin on a post rotary nystagmus board or hanging hammocks for lengthy periods of time. Nearly all of the children that I've tested with the *Ayres Sensory Integration Test* show some deprivation in sensorimotor integration. When evaluating the deaf-blind child, you must find out how the child uses sensory modalities. To check how the child uses his or her vision for tracking, use a flashlight. You can also get into tactile things. Have some cold water, warm water, and sand. Put the child's fingers in each and see what his or her responses are. You can even put things on the child's tongue or in the child's mouth if he or she is a cooperative child to see if he or she can discriminate between bitter, sour, sweet, and salty. You might also pick up all kinds of bottles of sweet smelling oils and see if anything turns the child on or if he or she discriminates between different odors. That gives us some idea of how intact the child's hearing, vision, tactile, and kinesthetic senses are. Then you can begin to find out if the child can combine two tasks within the same sensory modality. The next step is to see if he or she can associate between two modalities.

Now we've come to the cognitive part. Some of the questions I ask myself are: What is the child's attention span when the child is interested in something? When is the child self-motivated? When is the child motivated by the teacher? How about visual memory or auditory memory? Can the child come back and find something? Does the child remember sound, if he or she can hear it? What's

the child's response to novelty or surprise? Does he or she have curiosity about new kinds of textures, such as velvet or sandpaper?

How about something that might be called creativity? How many different responses does the child have to select from? How does he or she solve problems? Hand the child one block and then another block. What does the child do when you hand him or her the third block? Does the child drop them all, does the child put his or her hands together, does he or she take them in one hand or the other, or does the child refuse the block? Piaget calls this exploratory behavior groping and intelligent groping. Can the child assimilate as well as accommodate information whatever the sensory modality it comes in? Can he or she learn from experience? What are the chances of intelligent discovery there? To find this out we have to get down with a child and experience what's in the child's world. How about play activity? Does the child participate in parallel play with peers? That's pretty good for a lot of our deaf-blind children, many of whom are still at Piaget's sensorimotor stage. Is there imitative play; can he pretend? Representational play probably occurs in a child with no sensory deprivations at about three years. If a child has representational play, this suggests potential qualities for development of language. Again, you're always looking for what excites the child or what interests the child, what turns the child on, or what motivates the child at that moment.

The affective behavior tells you how the child handles his or her environment. Would you describe the child as an active or passive child? Where is the locus of control? For most of our deaf-blind children, the locus of control is not within themselves but outside. Can the child discriminate between strangers and familiar adults? Is the child aware of peers? Does the child show some jealousy with other children? Are the feelings appropriate? It is nice to know that the child is aware he or she is a person, that he or she is aware there are other persons, and that he or she can be jealous. What is the child's reaction to frustration or success? What is the child's reaction to being away from home?

I have discussed many things with you in sharing my experiences with deaf-blind children. I hope it has been helpful. I would like to encourage you to leap in and get involved with deaf-blind children. In the process things will happen to you. You will change.

Appendix A

Consideration for deaf-blind psychological evaluations (tests must be adapted to each child's needs, depending on extent of sensory deficits)

I. Self-help skills
   Denver Developmental Screening Test
   Maxfield-Buchholz Scale of Social Maturity for the Preschool Blind
   AAMD Adaptive Behavior Scale
   Vineland Social Maturity Scale or Preschool Attainment Record
   Deaf-Blind Scales of Development

II. Motor development
   A. Gross motor
      Ayres Southern California Test of Sensory-Motor Integration
      Merril Palmer Test
      Oseretsky-Lincoln
   B. Fine motor
      Lace or tie shoes
      Use of scissors
      Coloring within lines with crayon or chalk on board
      Stringing beads
      Beery-Buktenica Developmental Test of Visual-Motor Coordination

III. Sensory
   A. Hearing
   B. Vision
   C. Kinesthetic
      Ayres Southern California Test of Sensory-Motor Integration
   D. Tactile
      Temperature, texture
   E. Taste
      Sweet, bitter, sour, salty
   F. Olfactory
      Various scents from roses to ammonia
   G. Proprioceptive
   H. Perception or Associative-Integrative Factor
      1. Can discriminate within one modality
         Can combine in same modality
         Can associate two modalities (which ones?)
      2. *Ayres Southern California Test of Sensory-Motor Integration*
         Slingerland Specific Language Disability
         Bender-Gestalt (Bender Visual Motor Gestalt Test)
         Beery-Buktenica Developmental Test of Visual-Motor Coordination

IV. Cognitive
   A. Attention span
      Self-motivation
      Teacher motivation
   B. Memory
      Visual
      Auditory
      Tactile
      Kinesthetic
      Combination
   C. Response to novelty (adaptive behavior or need for dissonance)
      Jack-in-the-box
      New textures
   D. Creativity (selection or responses or problem solving)
      Give one block, then another block, then a third block
   E. Cause and effect
      Sees self as separate from others
      Feels he or she can affect environment
   F. Exploratory behavior
      Chance encounter
      Trial-and-error learning
      Assimilation and accommodation
      Learning from experience
      Intelligent discovery (Piaget)
   G. Play activity
      Observe peers
      Parallel play with peers
      Imitative play
      Representational play (indicates positive qualities for the development of the basis of language)
      Names activities for supervised and unsupervised time for play

V. Communication
   A. How does the subject communicate needs?

Gestures (describe)
Vocalizations
Natural representational signs
Learned abstract signs

B. Does the child recognize any words and match them to pictures?
C. Does the child use any speech or speech reading?
D. Does the child express any desire to communicate?
E. How does the child express feelings?
F. How does the teacher and parent communicate with the child?

VI. Affective
A. Active-passive (locus of control or Erickson's reciprocity and trust)
Erikson's stages of imitation and anticipation
Piaget's scale: need, curiosity or interest, and will
B. Object relationships (Piaget's object permanence)
Can the child discriminate between strangers and familiar adults?
Is the child aware that peers are there?
Does the child show some jealousy?
C. Appropriate feelings
D. Reaction to frustration and success
E. Self-image and/or spatial orientation
Body image
Response to mirror
Knows parts of body
F. Reaction to being away from home
G. Habits – mannerisms (describe)

VII. Abilities and needs

VIII. Recommendations and summary

The Psychological Implications of Testing: A Cautionary Note

Presented by Evelyn Greenleaf
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The following information has been compiled and documented because I am concerned with the practice of quoting numerical IQs based on tests not applicable to or standardized on deaf-blind subjects, test data which labels deaf-blind children as mentally retarded.

I am concerned about the effect that this test data will have on the educational placement of deaf-blind children. How will school personnel who are responsible for school admittance or placement and who are not knowledgeable in the area of testing as it pertains to hearing-impaired subjects react to this information? My contention is that the majority will look primarily at IQ numbers and the label of mental retardation. In turn, this may result in the child's rejection from special education programs or misplacement in developmental centers or programs for the mentally retarded.

Tests for blind children are inappropriate for deaf-blind subjects because of the language barrier. Some of the tests commonly administered to deaf subjects may be valid, but only with extreme caution. Consideration must be given to the complex visual limitations of each deaf-blind child. Explanations of why extreme caution should be exercised concerning the validity of comparing deaf and hearing children follow, and these cautions apply even more so to deaf-blind children.

Psychologists may obtain misleading results if they attempt to find out about the emotional and personality development of a deaf client through the use of psychological and personality tests. The traditional approach to the psychological and educational assessment of deaf children and adults has been to compare their performance with that of hearing persons on tests designed for the latter. Yet practically all language tests and paper-and-pencil tests will be invalid. Levine (1960) states that when a deaf person takes this kind of a structured test, he or she runs the risk of being considered a psychological deviate simply because his or her answers to certain questions do not coincide with those of hearing persons.

Evaluation of intelligence, motor ability, social maturity, personality, and perceptual skills has generally followed this same pattern. The interpretation of these test results has too often led to indiscriminate and inaccurate conclusions not appropriate to the needs of the deaf.

Extreme caution should also be exercised in comparing deaf and hearing children in educational assessment. Educators of the deaf are questioning the notion that deaf persons may be described by some measure of central tendency of the deaf that is in turn referred to a similar measure for the hearing. They reject the stereotypes that this practice creates, particularly for those uninformed about the complexities of deafness.

Deaf children are being educated with hearing children, and we recognize that the performance of deaf children needs to be related to their hearing peers. However, conventional tests do not describe adequately the language and language-related aptitudes, skills, and problems of deaf children. A large number of studies indicate that when tests standardized on a hearing population are used, deaf children commonly receive lower scores than the hearing subjects. The preponderance of evidence shows that if verbal tests alone are used, about half of the deaf children would be considered mentally retarded (Warren, 1963). This is obviously an unfortunate interpretation. Many retarded people are not considered capable of complex intelligent behavior, and yet they have learned their mother tongue, at least to a level that any school for the deaf would be proud to claim for the average deaf pupil. The point of this statement is that we should not confuse language achievement and intelligence (Furth, 1963).

Most investigators have restricted their experimentation to tests that require little or no knowledge of language. These tests may be classified as follows: individual performance tests that require the subject to perform some action, with instructions given in pantomime; and group nonverbal and nonlanguage tests that assume that the subject has

enough language to comprehend the examiner's instructions. A review of the studies of the deaf, using these tests, is very contradictory. Depending on the study, findings show the deaf to have equivalent IQs, lower IQs, and higher IQs when compared with hearing subjects. Lee Meyerson (1955) states that the evidence relating to intelligence, educational achievement, and personality of the deaf must be treated with great caution. The assumptions implicit in these tests are not met when the subjects are deaf children. In addition, inasmuch as almost all of the studies were methodologically inadequate with regard to sampling, administrative technique, and use of controls, their conclusions cannot be accepted as demonstrated (Meyerson, 1955).

Dr. Helmer Myklebust (1962) states, "Nonlanguage mental tests must be used with those whose deafness dates from the prespeech age if the deafness precluded the use of hearing in acquiring language." When using nonverbal tests, the problem of similarities and differences between verbal and nonverbal tests must be critically evaluated. Although these tests may correlate significantly, they measure different aspects of intelligence. Verbal tests correlate most closely with those abilities required for learning academic materials.

We may also question the extent to which similar test scores for deaf and normal hearing subjects can be interpreted as having the same meaning and the extent to which such scores can be used to predict the same type of success or failure in learning and adjustment. A common example is the lower correlation between test scores and academic achievement for the deaf as compared to the hearing students. The deaf individual apparently solves the test problem by different psychological processes, even though he or she earns the same score as the hearing individual on nonverbal tests.

To be most effective, psychological tests should be standardized on the deaf and the psychologist using these tests needs specific training and experience if he or she is to do work that is clinically valid (Myklebust, 1960).

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Psychological Implications of Assessing the Deaf-Blind

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Psychologists should use appropriate instruments to evaluate the potential of deaf-blind children, for it is predictable, almost without exception, that the child whose vision and hearing have both been significantly assaulted by rubella will achieve an intelligence quotient falling within the retarded range on most standardized tests. Psychologists also need to be cognizant of the special characteristics that affect the test results of deaf-blind children. We want to determine the child's potential, and we want to know how that child learns. To achieve these goals, we must be able to reach that inner world which has enveloped the child since birth. Children's responses to their disabilities are as individual as their fingerprints, and the methods used for testing must be adapted to the needs and abilities of each child.

Formal Tests

The Bender-Gestalt is a test that is familiar to most psychologists. It consists of nine cards with designs that are copied by the child. By outlining the designs with heavy cord, the test can be adapted for tactile as well as visual use. We use braided plastic cord because deaf-blind children seem to prefer touching (in order of preference) metal, plastic, and then wood. Most deaf-blind children for example, would choose to play with a metal spoon rather than a soft, cuddly toy.

The *Leiter International Performance Scale, Tray One,* is useful with older deaf-blind children. The materials consist of a response frame (wood), an adjustable card holder (plastic) and small, brightly colored wooden blocks which are easily manipulated. The test ranges from matching colors and forms through completing patterns and matching analogous designs to the classification of objects. The tests above those in Tray One require greater perceptual organization and fine visual discrimination.

The *Arthur Point Scale of Performance* has several sections which are useful if they are not timed. The sequin form board is made of wood and has recesses in which the children fit geometrical forms. The original form board was too large for most of the deaf-blind children we were testing, so we had a smaller version made. Some children are also able to use the "mare and foal" form board.

The *Cattell Infant Intelligence Scale* is frequently used for children from three to thirty months of age and includes a portion of the Stanford-Binet test.

The *Stanford-Binet Intelligence Scale Revised* (1960) for ages two and over is useful with some adaptations. For example, hiding the kitty under the box does not offer much incentive to deaf-blind children. So I substitute M&Ms, cereal, or raisins (whatever the child likes) for the kitty. This also makes it a good test of pincer grasp. The paper doll is not suitable for use with deaf-blind children, so we use a rubber doll that has eyelashes, an open mouth, fingers, and toes. We have the children feel our fingers, then their own fingers, and finally the doll's fingers. This transfer technique offers a better chance of success, but the training required is so slow that it is impractical for use in a battery.

The *Bzoch-Legue Receptive Expressive Emergent Language Scale* is useful in giving us some beginning language sampling, as is the Stanford-Binet. The *Maxfield-Buchholz Scale of Social Maturity for Use with Preschool Blind Children from Infancy to Six Years,* with the Jamieson adaptation, gives credit for language responses if tests immediately preceding the language item and immediately following the language item are passed.

For some deaf-blind children, the *Vineland Social Maturity Scale* is useful. We were not able to use the *Denver Developmental Screening Test* with deaf-blind children.

Informal Tests

Some informal materials are as useful for testing as formal ones. The Tupperware Company, for example, makes a form ball that is successful with our deaf-blind children. The form ball is a big blue and red plastic ball with yellow cut-outs shaped like stars, triangles, and circles. The ball can be

easily pulled apart and the forms dropped inside, or the child can replace the forms on the sides of the ball. Being plastic, the ball is easy to keep clean and the children like to touch it.

The commercial toy called "Lite Bright" is useful to establish rapport as well as to test formally. Our deaf-blind children love this toy and will play with it for 15-20 minutes, the longest we can get them to sit still at anything. We make Bender forms on the Lite Bright, letting the children trace the form with their hands and then have them try to reproduce it, either on the same Lite Bright or another one. We also use the Lite Bright for math concepts, putting groups of twos and threes together to see whether the children can repeat the groups. The pegs are rather small, but I use a piece of black construction paper for background and then the pegs show up beautifully. Large plastic letters in upper and lower case and large numerals can be purchased for use with the Lite Bright.

The Lakeshore Equipment Company sells packages of round plastic discs of different thickness which are useful. However, children tend to take bites out of these discs unless the examiner is very agile. Lakeshore Equipment Company also markets pairs of circles made of sandpaper, patent leather, lace, terry cloth, and other textures which can be used for matching. Also, assorted lengths of rubber tubing are available in yellow and blue. Our deaf-blind children prefer red and yellow to other colors.

Observation

Your evaluation of the child is going to be based mainly upon your observations, but you want to know as much as possible about this child before you begin to observe.

Check the child's hearing report but remember, figures do not always tell us very much. Ask the parents how and when they think the child hears. Does the child hear the telephone or the doorbell ring? The dog bark? What everyday things do they think the child hears?

Check the vision report. You want to know if and when eye surgery was done. Most deaf-blind children have had cataract surgery. You need to know the date of the last surgery so you don't ask children to do visual activities their eyes are not strong enough to do.

Look to see whether the child is toilet trained. Even when children are supposed to be toilet trained, in a new situation they might not be, so be prepared.

Next, look for allergies. You do not want to offer chocolate M&Ms to a child who is allergic to chocolate.

Ask parents how they get their child to cooperate. You want to know what the child likes. If you know what rewards the parent has found successful, you can use a familiar approach.

Then ask parents what their child does not like. Some deaf-blind children, for example, do not want to be touched, and this is important to know. If you pick up or cuddle a child who does not want to be touched, you may upset the child and then you will have to spend extra time undoing the damage.

After you have read the record and have established rapport with the child, you are ready to start making your own observations.

Begin by noting the mobility of the children. Do the children walk unaided? Can they get in and out of doors alone? Can they get a drink of water from the fountain? Can they find the chair and table? You want to know how much you are going to have to do for the children and how much you can expect the children to do for themselves. One mother, for example, always carried her son because she thought he couldn't walk. She left her child with us and within two days he was walking, holding on to an adult's hand.

What blindisms do the children have? Do they twirl? Poke at their eyes? Rock? Bang their heads on the wall? Shake their heads or their hands? Chew at themselves? Stare at light? I frequently darken the room in the beginning and then gradually turn on the lights. Overhead lights do not seem to be as stimulating as sunlight.

Check the children's vision next. Can they focus? How do they look at objects? What is the speed of their visual perception? What kind of accuracy do they have in looking for items they want to handle or in looking from one object to another? We had one deaf-blind child who could find an M&M on the floor four feet away. Now *that* is accuracy. He wouldn't see a book on the floor, but he could find the M&M.

Do the children keep their eyes on the object as it moves toward them? As it moves from side to side? Up and down? At an angle? How do they use their eyes?

How do the children use their eyes and hands together? Can they catch a ball? Can they see it if it's bouncing? This is part of that up and down vision. How can you catch a ball bouncing up and down if your vision won't track this way? Teachers need this kind of information.

Follow the same procedure with hearing. How do the children hear? We found that many children who were not testing well in formal tests would hear the transistor radio behind them. For example, I put on music and they turned to the side where the sound was. We also found children in bed without hearing aids responding to music through a pillow speaker at night. The otologist and audiologist said that these children couldn't hear. Maybe they were responding to vibration in the pillow, but they were responding.

Make notes on how the children communicate. Do they drag you to the Coke machine? Do they put your hand in the candy box? How do they let you know what they want?

What emotions do these children express? Do they cry? Laugh? What is their frustration tolerance? Can they concentrate? For how long?

Far more danger exists that a low IQ score is wrong than that a high one is accurate when you are testing deaf-blind children. Many things lead to a child's not performing to capacity, but almost none lead to a child's performing above capacity. I think the highest score we ever got was 67 on the Leiter and we were all excited. We thought the child was a genius, a real genius. I think that it is more important to think of sensory-deprived children in terms of potential–potential ability to live in this world as a person. On a scale of one to ten, how do you think this person will fit into our world, our classrooms, our homes? Two, not very well; ten, great; five, average. This is a better judgment, it appears to me, than saying a child is functioning at an IQ of 20 or 48.

Testing is a field that takes imagination as well as psychological knowledge. We don't have printed tests for deaf-blind children. We do have you and your imagination, your creativity and your good sense, and your love for children. These need to be combined into a report that has meaning to parents and to teachers.

Writing the Report

The following example is part of a case study of a deaf-blind girl who was nine years old when we first saw her.

Her mother had rubella during the first month of pregnancy. The child sat alone at fourteen months, walked at three years, and was toilet trained between four and five years. The girl was born with a congenital heart disease and cataracts which were operated on during the first year of life.

She has nystagmus and holds an object so close to her left eye that the object frequently scratches the lens. Accurate vision cannot be established due to the lack of communication. She has a hearing aid in the right ear but does not respond to any auditory stimuli, nor does she attempt lipreading. She will momentarily attempt the Tadoma motor-kinesthetic method and uses some manual language. She vocalizes only when frustrated. However, she can make her wants understood and has a real facility for selecting Coke from a machine containing a variety of flavors.

She has some self-help skills, but a low frustration tolerance. She can dress herself if the clothes are laid out or handed to her correctly. She cooperates well and can undress herself if her shoes are untied. She needs to develop her knowledge of front and back, and we suggested using tabs to mark the front of her pants and the front of her blouse. She can button in front, so we said the next step was to teach her to button on the side. She can zip and unzip, but she cannot hook an eye. She can put on her socks and shoes, but can't tie untie, or lace her shoes. She is toilet trained, but she needs to learn to flush the toilet.

She used good chewing ability for candy but would not chew other things, so we suggested that they increase the desire for chewable foods. She uses a fork well, but uses a spoon poorly. She needed increased hand control of the spoon with liquids, so we suggested using a weighted spoon. (Weighting the handle of a spoon with modeling clay will give the child a better grip.)

She learned the primary colors through constant repetition. The next thing to learn was matching by size and texture. We suggested beginning by matching labels on cans. This would also give her an incentive to eat other chewable foods.

Her psychomotor development is retarded. She can use a pegboard, but needs to be taught to make a pattern with the pegs. She can string beads, but cannot make a pattern with the beads, nor can she copy a pattern of beads. She can put a pellet in a box and put small buttons in a box, but she cannot sort by black and white.

The time tables that we find in books that tell us when children should be able to do a certain task are only approximate. Their value is not so much in the time which they give for the events to happen, but the order in which we can expect them to take place. Most children go through a pattern of development in all major areas: sleeping, eating, walking, playing with other children, and

learning. You can use this sequence of skills to decide where to begin working with this child.

I also ask parents to name one thing they wish their child could do. Then I ask the child's teacher the same thing. Whatever they want, we work on at home and at school. Each week, we discuss the progress of what we are doing so we can help each other. It's like a joint prescription, a joint educational endeavor. We are working together, and each of us gets one thing done, however long it takes to accomplish it.

Conclusion

The things that happen to children in the name of education are sometimes pretty sad. The things that happen to children in the name of parental love are sometimes pretty sad. Parents deprive their children because they don't know how to help them. Teachers deprive these same children when they don't know how to help them. You, the psychologist, are supposed to be the expert: you have a license that says you are a specialist in child behavior, in child growth. Your job is to find ways in which parents and teachers can help these children learn. You must care enough to try. Remember that these children have potential. Deaf-blind children can learn. They can be taught. Don't be discouraged. Everyday we learn something new. Use your imagination, be creative, and have faith.

Resource List of Tests Utilized With Deaf-Blind Children

The following tests are those mentioned in the presentations included in this proceedings:

AAMD Adaptive Behavior Scale
American Association on Mental Deficiency
5201 Connecticut Ave., N.W.
Washington, D.C. 20015

Auditory Apperception Test
Western Psychological Services
10231 Wilshire Blvd.
Los Angeles, CA 90025

Bender Visual Motor Gestalt Test
The Psychological Corporation
757 Third Ave.
New York, NY 10017

Callier Azusa Scales
Callier Center for Communication Disorders
University of Texas, Dallas
1966 Inwood Road
Dallas, TX 75235

Crawford Small Parts Dexterity Test
The Psychological Corporation
757 Third Ave.
New York, NY 10017

Denver Developmental Screening Test
Ladoca Project and Publishing Foundation, Inc.
East 51st Ave. and Lincoln St.
Denver, CO 80216

Developmental Test of Visual-Motor Integration
Psychologists and Educators, Inc.
Suite 212, W. State St.
Jacksonville, IL 62650

Flash Card Vision Test
New York Association for the Blind
1111 E. 59th St.
New York, NY 10022

Goodenough-Harris Drawing Test
The Psychological Corporation
757 Third Ave.
New York, NY 10017

Kuder Preference Record
Science Research Associates
259 E. Erie St.
Chicago, IL 60611

Maxfield-Bucholz Scale of Social Maturity for the Preschool Blind
American Foundation for the Blind, Inc.
15 W. 16th St.
New York, NY 10014

Minnesota Rate of Manipulation Test
Western Psychological Services
10231 Wilshire Blvd.
Los Angeles, CA 90025

Minnesota Vocational Interest Inventory
The Psychological Corporation
757 Third Ave.
New York, NY 10017

Ohio Vocational Interest Survey
Harcourt Brace Jovanovich, Inc.
757 Third Ave.
New York, NY 10017

Peabody Picture Vocabulary Test
American Guidance Service, Inc.
Publishers Building
Circle Pines, MN 55014

Preschool Attainment Record
American Guidance Service, Inc.
Publishers Building
Circle Pines, MN 55014

Southern California Sensory Integration Tests
Western Psychological Services
10231 Wilshire Blvd.
Los Angeles, CA 90025

Thematic Apperception Test
The Psychological Corporation
757 Third Ave.
New York, NY 10017

Vineland Social Maturity Scale
American Guidance Service, Inc.
Publishers Building
Circle Pines, MN 55014

Weschler Adult Intelligence Scale
The Psychological Corporation
757 Third Ave.
New York, NY 10017

Weschler Intelligence Scale for Children
The Psychological Corporation
757 Third Ave.
New York, NY 10017

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