In 1965, McCay Vernon drove a stake through the heart of the long-established “truth” that deaf people were inferior to hearing people. Launched by Aristotle, emboldened by the 1880 Conference of Milan, and reiterated in the twentieth century through the biased research of many psychologists, this falsehood persisted until the publication of this classic review paper. Vernon succinctly spotlights biases in IQ assessment of deaf children resulting from improper testing methods, research participant sampling, even the experience level of the evaluators themselves. Brief and scholarly, the paper had enormous impact not only on future research regarding cognition and deaf people but on clinical practice as well. Within this paper, insights are evident which Vernon has continued to elucidate throughout his long career. He was arguably the first psychologist to view the deaf population as a heterogeneous one, noting how various hearing loss etiologies differentially affect cognition and other psychological characteristics. His later research, notably that which focused on rubella, deafblind, and deaf forensic populations, has been similarly pioneering. McCay Vernon’s extensive professional impact stems not only from his prolific, readily applied research work but also from his generous and vigorous activities as a teacher, a mentor, and advisor. – Robert Q. Pollard, Jr.

There have been approximately 50 comparative studies of the intelligence of those who are deaf or hard-of-hearing published since the advent of intelligence testing in the early 1900s. This kind of intensive research effort is in large part a recognition of the especially crucial role intelligence assumes in the lives of those who have severe hearing impairment. The data is also important because of the unfortunate but rather common misconception of many lay persons that deafness is associated with a lack of intelligence.

It is the purpose of this paper to present succinctly the major findings of these 50 years of research, some general considerations in critically reviewing the studies, and the current implications of the research. In doing this, the investigations prior to 1930 are presented in narrative form, then a tabular summary of studies carried out from 1930 to 1967 is presented, followed by the review and implications sections.

Research Prior to 1930

Pintner and Patterson (1915, 1916, 1917) were the first to administer intelligence tests to deaf children. They found that on the verbal IQ measures which they were using, the deaf as a group were scoring in the mentally retarded range (Pintner & Patterson, 1915). Realizing that what they were measuring was not intelligence but the language deprivation concomitant with deafness (Pintner & Patterson, 1921), they developed the Pintner Non-language Test (Pintner & Patterson, 1924) in order to be able to measure intelligence independent of the language variable. Although this instrument yielded findings which indicated deaf youths to be nearer in intelligence to the normal population than had the verbal tests, Pintner and Patterson’s results (1924) still yielded means on samples of deaf children which were significantly below those obtained on normal hearing children.
During this same period, Reamer (1921) tested 2,500 deaf children using a battery of six nonlanguage tests, including the Pintner Drawing Completion Test and an imitation test based on the Knox Cubes. Results indicated a mental age retardation of about two years for the deaf sample. Later, Day, Fusfeld, and Pintner (1928) in a survey of 4,432 pupils ranging in age from 12 to 21 plus came to the same conclusion.

The first investigation to contradict the finding of below-average intelligence among the deaf was that of Drever and Collins (1928). They published results of their performance test administered to 200 deaf and 200 hearing children, from which they concluded that when language was not a factor, deaf and hearing children were approximately equal in mental ability.

These pre-1930 studies were pioneering efforts in a new field. From them was learned the inappropriateness of verbal tests for measuring the intelligence of deaf children. These investigations also gave indications of what has later been found to be the error of attempting to do group intelligence testing with deaf subjects.

In view of later findings using improved psychological measures and techniques, the validity of the Day, Fusfeld, Pintner, and Reamer conclusions of mental age retardation ranging from 2 to 5 years among the deaf is no longer tenable. A contributing factor, aside from errors of test selection and administration, that would account for some of the retardation reported by these early studies could have been the practice (common in the early 1900's) of placing nondeaf mentally retarded children in schools for the deaf.

General Considerations in Reviewing the Investigations

In the interest of brevity, no effort will be made to review each of these studies individually. Instead, certain problems common to groups of them will be enumerated. Also, basic principles involved in testing deaf and hard-of-hearing children which should be considered in evaluating the findings will be discussed.

A number of the studies used group-testing techniques. As indicated earlier, this was found to be an inappropriate procedure. The communication problems of profound hearing loss, the attentive set of deaf children toward psychological examination, and other aspects of test administration rule out group intelligence testing if result are to have validity (Bridgman, 1939; Hiskey, 1955; Lane & Schneider, 1941; Levine, 1960, p. 221; Vernon & Brown, 1964). Most frequently, post-1930 efforts at group testing have involved the Goodenough Draw-A-Man Test and the Chicago Non-Verbal Examination. The latter has subtests which are difficult to administer individually to deaf children and almost impossible to give effectively in groups. The Goodenough, especially when given to groups, often requires that the examiner draw sample figures in order to convey directions. In addition, children in groups generally observe the work of one another, incorporating the ideas they gain into their own drawings. These administrative problems cast what might be euphemistically termed “a dubious light” on the validity of the results. Another point to be considered is that almost all of the investigations involved only samples of deaf children who were in school programs for the hearing impaired. This approach involves incomplete sampling and leaves unanswered the question of the intelligence of deaf children not in these schools. Some may have been in hospitals for the retarded. Others may have been rejected by schools as retarded and been kept at home. Some were undoubtedly in programs for the normally hearing.

Finally, in evaluating the studies, it should be noted that the work done by investigators who were experienced in the psychological testing of deaf children at the time they did their work (see notations on Table 1) yielded results showing the deaf and the hearing more nearly equal in intelligence. As the experience of the

Research Since 1930

From 1930 until today many investigators have measured the intelligence of samples of deaf and hard-of-hearing children. These findings have been compared to those obtained on matched groups of normal hearing children, to test norms, and to subgroupings among the hearing impaired.

The 37 studies done during this period are presented in Table 1. The reference for each of these investigations is given along with data on the samples, tests used, and salient findings and/or conclusions.

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<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Peterson, E. G., and Williams, J. M. (1930)</td>
<td>466 deaf, 4–9</td>
<td>Goodenough</td>
<td>Average retardation: 1 10/12 yrs.</td>
</tr>
<tr>
<td>MacPherson, June, and Lane, Helen S. (1932)</td>
<td>61 deaf children</td>
<td>Hiskey, Randall's Island Series</td>
<td>Mean IQs: 116.6 and 113.87, respectively</td>
</tr>
<tr>
<td>Meyer, M. F. (1932)</td>
<td>132 Deaf, 5–20</td>
<td>Lectometer</td>
<td>Deaf scored slightly lower</td>
</tr>
<tr>
<td>Shirley, Mary, and Goodenough, Florence (1932)</td>
<td>406 deaf, 6–14</td>
<td>Goodenough, Pintner Nonlanguage</td>
<td>Medians 87.7 and 98.4, respectively</td>
</tr>
<tr>
<td>Lane, Helen S. (1933)</td>
<td>43 deaf preschoolers</td>
<td>Randall’s Performance</td>
<td>Medians: 96 (in 1931); 97 (in 1932)</td>
</tr>
<tr>
<td>MacKane, K. (1933)</td>
<td>Deaf children</td>
<td>Grace Arthur, Pintner-Patterson, Drever-Collins, Pintner Nonlanguage</td>
<td>Retardation: 1 yr. or less; Pintner: less than 2 yrs</td>
</tr>
<tr>
<td>Lane, Helen S. (1934)</td>
<td>43 deaf children</td>
<td>Randall’s Performance</td>
<td>Median: 96 (in 1931); 97 (in 1932)</td>
</tr>
<tr>
<td>Lyon, V. W. (1934)</td>
<td>Deaf children</td>
<td>Grace Arthur, Pintner Nonlanguage</td>
<td>Medians 92 and 84, respectively</td>
</tr>
<tr>
<td>Bishop, Helen M. (1936)</td>
<td>90 deaf and hard of hearing</td>
<td>Grace Arthur</td>
<td>Normal distribution</td>
</tr>
<tr>
<td>Peterson, E. G. (1936)</td>
<td>100 deaf, 5 7/12–17</td>
<td>Kohs Block Design</td>
<td>Mean IQ: 92.5; range: 54–156; scores clustered around 80 and 100 with 17% at each</td>
</tr>
<tr>
<td>Scyster, Margaret (1936)</td>
<td>50 preschoolers</td>
<td>Minnesota Preschool, Merrill-Palmer, Pintner-Patterson</td>
<td>Deaf showed no retardation</td>
</tr>
<tr>
<td>Lane, Helen S. (1937 and 1938)</td>
<td>250 deaf, 5–19</td>
<td>Lectometer, Randall’s Performance</td>
<td>Equal ability; median: 97.6</td>
</tr>
<tr>
<td>Lane, Helen S. (1938)</td>
<td>50 deaf preschoolers</td>
<td>Drever-Collins</td>
<td>Deaf mean: 105–122; depending on scoring method</td>
</tr>
<tr>
<td>Springer, N. N. (1938)</td>
<td>330 deaf, 6–12</td>
<td>Goodenough</td>
<td>Deaf scored appreciably lower, with congenitally below adventitiously deaf</td>
</tr>
<tr>
<td>Streng, Alice, and Kirk, S. A. (1938)</td>
<td>97 deaf children (4th and 5th graders)</td>
<td>Grace Arthur, Chicago Non-Verbal</td>
<td>Same results as normals; age at onset not a factor</td>
</tr>
<tr>
<td></td>
<td>1,404 hard of hearing</td>
<td>Pintner IQ Test</td>
<td>Mean: 94.7</td>
</tr>
<tr>
<td></td>
<td>1,556 normal</td>
<td>Pintner IQ Test</td>
<td>Mean: 101.6</td>
</tr>
<tr>
<td>Pintner, R., and Lev. J. (1939)</td>
<td>315 hard of hearing</td>
<td>Pintner Nonlanguage</td>
<td>No significant difference compared to normals</td>
</tr>
<tr>
<td>Burchard, E. M., and Myklebust, H. R. (1942)</td>
<td>189 deaf children</td>
<td>Grace Arthur</td>
<td>Deaf IQ is average; no significant difference between congenitally and adventitiously deaf</td>
</tr>
<tr>
<td>Johnson, Elizabeth H. (1947)</td>
<td>57 deaf children</td>
<td>Chicago Non-Verbal</td>
<td>Six groups with mean IQs of 73, 69, 69, 78, 85 and 99, respectively, from pregrade 2 to grade 3</td>
</tr>
<tr>
<td>Kirk, S. A., and Perry, June (1948)</td>
<td>49 deaf and hard of hearing children</td>
<td>Ontario, Nebraska</td>
<td>No conclusion re relative intelligence</td>
</tr>
<tr>
<td>Myklebust, H. R. (1948)</td>
<td>Deaf children</td>
<td>WISC Performance</td>
<td>Mean IQ: 101.8</td>
</tr>
<tr>
<td>Glowatsky, E. (1953)</td>
<td>24 deaf and hard of hearing, 7.5–15.7</td>
<td>Goodenough</td>
<td>Mean IQ: 98.46</td>
</tr>
</tbody>
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examiner has strong direct bearing on the validity of test results, these studies must be given special emphasis in any consideration of the relative intelligence of deaf and hearing children on IQ measures.

**Implications**

Within the scope of this paper no extensive efforts will be made to deal with the broad issue of the nature of intelligence. However, implicit in the work with the performance scales is the assumption that these tests measure to an appreciable extent innate potential for learning. As it has been demonstrated that performance tests correlate with academic achievement about as closely as verbal tests (Birch & Birch, 1956; Birch, Stuckless, & Birch, 1963; Brill, 1962), this paper takes the position that there is substantial credulity to the assumption that performance scales are a reasonable valid measure of ability to learn.

With this general concept of intelligence as a frame of reference, important implications can be derived from the data. First, it is obvious from an examination of the IQ distributions given in the 37 studies that the range of intelligence among those with profound hearing loss is as great as the range among the normal hearing. Mean IQ values are also similar based on an overall consensus of the studies. However, some of the

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<tbody>
<tr>
<td>Graham E. E., and Shapiro, Esther (1953)</td>
<td>20 deaf children</td>
<td>WISC Performance</td>
<td>Mean IQ: 96.1</td>
</tr>
<tr>
<td>Ross, Grace (1953)</td>
<td>61 deaf, 3–10</td>
<td>Ontario, Hiskey, Vineland</td>
<td>Mean IQs: 104.6, 104.8, and 94.7, respectively</td>
</tr>
<tr>
<td>DuToit, J. M. (1954)</td>
<td>289 deaf children from different schools and 180 from same school</td>
<td>DuToit's Nonlanguage Group Test</td>
<td>Mean IQ of 'different school' group: 98.53; mean IQ of 'same school' group: 99.96</td>
</tr>
<tr>
<td>Lavos, G. (1954)</td>
<td>90 deaf and hard of hearing children</td>
<td>Pintner General Tests, Chicago Non-Verbal, Revised Beta Examination</td>
<td>Correlation coefficients between tests ranged from 0.58–0.69; statistically significant</td>
</tr>
<tr>
<td>Frisina, D. R. (1955)</td>
<td>3 midwestern schools for the deaf</td>
<td>Grace Arthur</td>
<td>9.2–12% below 79 in IQ</td>
</tr>
<tr>
<td>Hiskey, M. S. (1956)</td>
<td>380 normal children</td>
<td>Hiskey</td>
<td>Mean IQs: normal hearers, 101; deaf, in mid-90’s</td>
</tr>
<tr>
<td></td>
<td>63 deaf children</td>
<td>Ontario</td>
<td>Mean IQ: 98.1; range: 52–129</td>
</tr>
<tr>
<td></td>
<td>77 deaf children</td>
<td>Grace Arthur</td>
<td>Mean IQ: 101.1; range: 61–147</td>
</tr>
<tr>
<td>Brill, R. G. (1962)</td>
<td>312 deaf, 5–16</td>
<td>WISC Performance</td>
<td>Mean IQ: 104.9</td>
</tr>
<tr>
<td>Mira, Mary P. (1962)</td>
<td>60 deaf preschoolers, mean age 4.77</td>
<td>Leiter, Hiskey</td>
<td>Mean IQs: 96.32 and 108.86, respectively</td>
</tr>
<tr>
<td>Vernon, M. (1967)</td>
<td>98 deaf children</td>
<td>Performance Scales</td>
<td>Postmaternal rubella mean IQ: 95</td>
</tr>
</tbody>
</table>

1Investigator experienced in the area of deafness at the time of the research cited.
more recent investigations (Anderson, Stevens, & Stuckless, 1966; Frisina, 1955; Vernon, 1966; Vernon, 1967a, 1967c, 1967d) suggest that there may be a disproportionately higher prevalence of low IQs among those in schools for the deaf and hard-of-hearing when compared to expected values for IQ distributions. Similarly, studies of retarded populations suggest a higher prevalence of impaired hearing, but not necessarily deafness, than is found in nonretarded populations (Mathews, 1975, p. 540; Kodman, Powers, Weller, & Phillip, 1963, p. 465).

The author’s findings in a series of studies (see Table 1) which examined the relationship of etiology of deafness to intelligence and the changes in etiology growing out of medical advances in treatment offer possible explanations of this disproportionateness of low IQs. Based on these studies and on an understanding of the disease conditions causing deafness, it is apparent that many of the etiologies of profound hearing loss are also responsible for other neurological impairment which frequently results in lower intelligence. The point to be made is that the relationship, if any, between mental retardation and deafness is not causal but is due to the common etiology which brought about both the deafness and the retardation. The fact that certain of these etiologies and conditions—maternal rubella, purulent meningitis of early onset, premature birth, tuberculous meningitis, etc.—are responsible for an increasing percentage of the deaf school-age population suggests that there may be proportionately more retardation among deaf children in the future.

Another implication from the data in Table 1 comes from the studies comparing the hard-of-hearing with the deaf and the congenital deaf with the adventitiously deaf. These investigations indicate that there is no relationship between degree of hearing loss and IQ or age of onset of deafness and IQ. Exceptions were noted in the case of certain etiologies, such as meningitis (Vernon, 1967a).

In sum, the implication of the research of the last fifty years which compared the IQ of the deaf with the hearing and of subgroups of deaf children indicates that when there are no complicating multiple handicaps, the deaf and hard-of-hearing function at approximately the same IQ level on performance intelligence tests as do the hearing.

In addition to what can be concluded from these research data about intelligence in hearing-impaired children, there are other areas to which the data can be generalized.

First, as the severely hearing-impaired are a language-deprived group and performance IQ tests are in essence cognitive tasks, the implication follows that level of language development may not be related to cognitive functioning. The logic of this position is that the deaf, a language-deprived group, score as well as the controls who have normal language development. A more thorough examination of this serendipitous interpretation of these data is in print (Vernon, 1967b).

Second, it has been noted that deaf children, a group with severe cultural deprivation due to lack of experience with language, do as well on performance IQ tests as normal hearing children without this deprivation. The implication is that cultural deprivation may not play the role currently being ascribed to it in the development of intelligence.

A final note, highly relevant to professionals working with deaf adults, is that no study of the intelligence of the adult deaf has been reported in the literature. This rather prominent gap in research might offer an area for productive investigation.

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2005: McCay Vernon is Professor Emeritus, Western Maryland College, and Chairperson of the National Deaf Academy Advisory Board. This article was originally published in 1968, in the Journal of Rehabilitation of the Deaf, 1, pp. 1–11, and is reprinted here with permission of ADARA.

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