

Offenders in a Silent World: Hearing Impairment and Deafness in Relation to Criminality, Incompetence, and Insanity

Bruce Harry, MD, and Park Elliott Dietz, MD, MPH, PhD

Hearing impairment is so often an invisible disability that it does not often enter the awareness of those whose senses are intact. A textbook knowledge of the physiology and pathology of hearing does not prepare the clinician to cope with a hearing-impaired family member, friend, or colleague, with whom we feel embarrassed, lest our raised voices attract too much attention. We are even less prepared to evaluate or treat hearing-impaired persons in the course of our professional activities.

Yet hearing impairment is common, and the profoundly deaf probably suffer mental disorders at a rate in excess of that of their hearing peers. Profound deafness, the absence of functional or remediable hearing, is extremely disabling. Profound deafness that occurs prior to complete acquisition of verbal language is socially and psychiatrically devastating.^{1,2} Such deafness, also known as prelingual deafness, is believed to result in uneven, incomplete, or arrested personality development^{3,4} and behavioral disturbances,⁵ the understanding of which is complicated by the natural language barrier. Prelingually deaf offenders are said to have special problems within the criminal justice system,⁶⁻⁹ analogous in some respects to the diagnostic difficulties known to accompany such deafness.¹⁰⁻¹²

At least since the late nineteenth century, commentators have questioned whether hearing impairment is associated with criminality. The legal status of the "deaf-mute" defendant has been coupled with that of the mentally disordered for centuries. Observations on these issues are scattered throughout the writings of disparate disciplines, and we are unaware of efforts to systematize the inconclusive and sometimes conflicting findings. In this article, we touch upon the historical legal status of the deaf-mute defendant, present data on a study of deaf defendants admitted to a maximum security psychiatric facility, and review studies exploring possible relationships between hearing impairment and adult criminality and between hearing impairment and juvenile delinquency. We bear no pretension that this is a

Dr. Harry is assistant professor of psychiatry in the School of Medicine and adjunct assistant professor of law in the School of Law, University of Missouri, Columbia, MO 65212. Dr. Dietz is associate professor of law in the School of Law, associate professor of Behavioral Medicine and Psychiatry in the School of Medicine, and medical director of the Institute of Law, Psychiatry and Public Policy, University of Virginia, Charlottesville, VA 22901. He is vice-president of the Academy.

comprehensive review of any of these topics, but we hope it may prove to be a useful starting point for further work in an area neglected by psychiatric criminologists.

The Legal Status of Deaf-Mute Defendants

The legal status of the deaf-mute (i.e., prelingually deaf) defendant is bound historically to that of the mentally disordered defendant. In 1856, Peet¹³ reviewed the history of Western law as it applied to deaf-mutes. He cited an English case from 1576 in which "a man arraigned for a felony in the reign of Edward III, who could neither speak nor hear . . . was, therefore, remanded to prison." Peet¹³ likened this action to that taken against a man "who was mad" and subsequently remanded to prison because he could not be arraigned. Another English case, in which an accused deaf man challenged his detention as incompetent to plead, held that his condition of "deafness and inability to read and write and, therefore, to be communicated with, was equivalent . . . to a finding of insanity" for the purposes of the Criminal Lunatics Act of 1800.¹⁴ A later English case, *R. v. Roberts*, acknowledged common law tradition in noting that "it is not merely defects of the mind which may bring about that result [of incompetency]. Defects of the senses, whether or not combined with some defect of the mind, may do so, and the authorities are clear that, if there are no certain means of communication with the defendant . . . he should then be found unfit to plead."¹⁵ The Court in *Roberts* nonetheless allowed trial to proceed for the deaf-mute defendant whose counsel rightfully believed his innocence could be proved.

The *Roberts* decision was relied upon in an Illinois State Supreme Court decision granting trial to a deaf-mute defendant¹⁶ whose ordeal was widely publicized through the book *Dummy*¹⁷ and television film of the same name. It is noteworthy that the plaintiff in *Jackson v. Indiana*, which resulted in a landmark Supreme Court decision for all incompetent defendants, was also a deaf-mute.¹⁸

The deaf-mute was also presumed to lack criminal responsibility in early common law. Peet¹³ noted that a "deaf-mute is, in presumption of law, an idiot, not punishable criminally for his acts, until it is shown that he is endowed with sufficient intelligence to enable him to discriminate between right and wrong; and the burden of showing this is upon those who prosecute him . . ."¹³ This is similar to another legal tradition. According to ancient Talmudic law, "the deaf-mute, the insane, and the minor . . . cannot be made responsible" if they injure others.¹⁹ Although this attitude persisted for centuries, there has been a change toward the presumption of criminal responsibility for deaf defendants²⁰⁻²² since the middle of the nineteenth century.

It has been suggested recently that prelingually deaf offenders may have impaired competency as the subjects of police questioning. Vernon and Coley²³ have noted that the Miranda warning, as given in most jurisdictions, is at a "lexical, syntactical, and conceptual" level such that it is above the comprehension of 90 percent of prelingually deafened adults. They also note that it is "impossible to communicate the concepts adequately even if the warning is put in sign language because of the lack of existing signs for crucial legal terms contained in the warning." Other authors^{24,25} have also questioned the ability of prelingually deaf suspects to make voluntary statements during police questioning, despite the presence of interpreters.

Attempts to systematically study prelingually deaf offenders are hampered by the low prevalence of prelingual deafness.²⁶ Investigators have had to rely on a variety of sources for case ascertainment, including criminal justice and mental health agencies, and even newspaper reports. Remvig and Stürup^{27,28} described 32 prelingually deaf offenders, 5 of whom were in a security hospital for the "criminally insane." Their charges were mostly for minor offenses such as indecent exposure and theft. The authors believed these patients to be overrepresented in the security hospital, though prevalence data for other populations were unavailable. Klaber and Falek⁶ identified 51 prelingually deaf offenders. Although the authors stressed the high proportion of their subjects who were sex offenders, half of their "sex offenses" were homosexuality and promiscuity. Based on anecdotal accounts, they suggested that deafness lessens the likelihood of arrest for minor charges, lessens the severity of sentence imposed by the court, and decreases the presumed value of probation and parole counseling, though none of these hypotheses could be tested.

A Study of Profoundly Deaf Defendants

We conducted a population-based study of prelingually deaf defendants admitted to a maximum security psychiatric facility to determine whether the suggestion of Remvig and Stürup^{27,28} of a higher than expected prevalence could be confirmed and to see how such patients fared.

Data were abstracted from archival records of all profoundly deaf defendants admitted to the maximum security unit of a midwestern state mental hospital from 1971 through 1980. Multiple charges and diagnoses were recorded, where applicable. One of us (B.H.) transformed all diagnoses into DSM-III nomenclature by careful review of the records for recorded signs and symptoms and by following the transformation guidelines contained in DSM-III. Records were also carefully inspected to determine the etiology of the deafness, if known. Competence to stand trial, criminal responsibility, and civil commitment were measured by court findings rather than by psychiatric opinion.

Table 1. Characteristics of Profoundly Deaf Defendants

Patient	Age	Charges	Sequential Legal Dispositions	Months in Maximum Security	Diagnoses (Axes I-III)
Prelingually deaf					
1	21	Capital murder, 4 counts	Competent Responsible	2	I. No diagnosis II. Schizoid personality III. Familial deafness
2	21	Sexually molesting a minor, 4 counts	Not competent NGRI Civil commitment	9	I. Organic mental disorder, mixed II. No diagnosis III. Congenital deafness (rubella)
3	21	Assault with dangerous and deadly weapon, 2 counts; rape	Not competent Civil commitment	36	I. Mild mental retardation Organic mental disorder, mixed II. No diagnosis III. Congenital deafness
4	39	Murder	Not competent NGRI Civil commitment	84	I. Moderate mental retardation II. Passive-aggressive personality III. Congenital deafness
5	44	Sexually molesting a minor	Not competent Civil commitment	114	I. Pedophilia II. No diagnosis III. Congenital deafness
Postlingually deaf					
6	74	Assault	Competent Responsible	2	I. Alcohol dependence II. No diagnosis III. Acquired deafness
7	72	Driving under the influence of alcohol	Competent Responsible	1	I. Alcohol dependence II. Schizoid personality III. Acquired deafness

Results

From 1971 through 1980, seven profoundly deaf defendants were newly admitted to the maximum security hospital for the purpose of pretrial evaluation. Five of these defendants were prelingually deaf. In view of the decentralization of forensic psychiatric evaluations after 1975, only those patients admitted from 1971 through 1975 were used to calculate the prevalence of prelingual deafness among defendants admitted for pretrial evaluation. Of 780 defendants newly admitted to the maximum security hospital for pretrial evaluation from 1971 through 1975, 4 were prelingually deaf. Thus, the prevalence of prelingual deafness in this population was 5.1 per 1,000.

Table 1 summarizes pertinent data for the seven profoundly deaf defendants. All of the deaf defendants under age 70 were prelingually deaf. The mean admission ages were 29.2 years for the prelingually deaf defendants ($n = 5$) and 73.0 years for the postlingually deaf ($n = 2$). The mean duration of maximum security hospitalization was 49.0 months for the prelingually deaf and 1.5 months for the postlingually deaf. All five prelingually deaf defendants were charged with serious crimes against persons (see Table 1, Cases 1 to 5): two were charged with murders and three with sexual assaults.

Three of the five prelingually deaf defendants received diagnoses suggestive of cerebral impairments (organic mental disorder or mental retardation), while none received a diagnosis of a functional psychotic disorder. None of the prelingually deaf defendants but both postlingually deaf defendants had substance use disorders.

Four of the five prelingually deaf defendants were adjudicated incompetent to proceed with trial. Two of the five prelingually deaf defendants were ultimately found not guilty by reason of mental disease or defect (NGRI) and were then civilly committed.

Discussion

A review of the archival records of a midwestern maximum security psychiatric hospital has shown that the prevalence of prelingual deafness among defendants newly admitted to that facility for pretrial evaluation was 5.1 per 1,000. This is five times as great as the prevalence of prelingual deafness in the general population, which has been estimated at 1.0 per 1,000.²⁶ Although based on small numbers, the increased prevalence of prelingual deafness in this setting suggests several explanations. There is no reason to expect an increased base prevalence of prelingual deafness in the state where this study was completed. Thus, increased criminality among the prelingually deaf, an increased rate of pretrial referral for prelingually deaf defendants, or an association between prelingual deafness and psychi-

atric hospitalization are possible explanations. The prevalence of prelingual deafness among patients in civil mental hospitals is also believed to be five to ten times higher than expected.¹¹ Thus, our observations do not necessarily indicate either higher rates of criminality among the prelingually deaf or higher rates of pretrial hospitalization for deaf defendants. Moreover, each of the deaf defendants admitted for pretrial evaluation was given at least one DSM-III diagnosis. Thus, we found no evidence that deafness alone was the basis for pretrial hospitalization.

Although based on small numbers, our observation that prelingually deaf defendants were likely to be found incompetent to stand trial or not guilty by reason of mental disease or defect demands explanation. Three of the four deaf defendants in our study who were found incompetent to stand trial were believed to have an organic mental disorder, mental retardation, or both. Only those deaf defendants found to be incompetent to stand trial underwent prolonged confinement in maximum security. In only one case, that of a pedophile, was a deaf defendant found to be incompetent without evidence of a mental disorder that could account for this finding. His subsequent civil commitment for nearly a decade is the only clear evidence we noted of an inappropriate legal outcome, and it is inappropriate only in that pedophilia is not customarily regarded as a mental disease for purposes of civil commitment. The other deaf defendants had legal outcomes apparently consistent with their mental disorders, though we cannot exclude the possibility that they would have been judged differently had they not been deaf.

Hearing Impairment and Adult Criminality

An association between hearing impairment and criminality has been repeatedly postulated. In the late nineteenth century, Lombroso²⁹ regarded all of the senses, including hearing, as dulled among born criminals. In their treatise on female offenders, Lombroso and Ferrero³⁰ cited Tarnowsky³¹ in support of this view. Based on her study of Russian women, she reported that hearing was weakened in 14 percent of moral peasants, 24 percent of prostitutes, 30 percent of thieves, and 40 percent of murderers; an additional 2 percent of prostitutes, 2 percent of thieves, and 6 percent of murderers were deaf.³¹ Drahrs,³² citing Lombroso,²⁹ noted that "hearing was normal in 86.68 percent of thieves and 54 percent of homicides." Ellis³³ noted that Gradenigo examined the hearing of "instinctive and occasional criminals" at the urging of Lombroso.²⁹ Of these criminals, 67.3 percent of the men and 53.5 percent of the women had inferior hearing. Gradenigo also studied noncriminal men and women "chiefly of the lower class" and found that 44.6 percent of the men and 22 percent of the women had diminished hearing.

Healy³⁴ reported the cases of two deaf criminals and believed it was obvious that "deaf-mutism might lead to extreme recalcitrancy." Although he offered no quantitative data, Healy³⁴ observed that "[i]n some cases the inherited or acquired causes of the affection, generally one of the nervous system itself, has also left in its train a thoroughly unstable nervous makeup." Best²¹ claimed that deaf persons "are of a particularly passionate nature, or more inclined to outbursts of anger or violent temper, than are normal persons." von Hentig³⁵ asserted that the deaf had "an inclination to outbursts of anger, to crimes of violence, sometimes sex delinquency."

Walle and Morris³⁶ studied 25 nonrandomly selected offenders at Patuxent for communication disorders and found that 9 had hearing problems. Walle *et al.*³⁷ subsequently evaluated 128 selected offenders for communication problems at the same institution and found that 28 (21.9 percent) of the total sample had hearing difficulties.³⁸ Twenty of those with hearing problems had sensorineural involvement, thus suggesting central nervous system disease. Unfortunately, the techniques used and normative data were unreported in these studies. Melnick³⁹ evaluated 4,858 male prison inmates by questionnaire and screening audiometry and found that 384 (7.9 percent) had significant hearing loss in at least one ear. One hundred sixteen men (2.4 percent) had bilateral hearing impairment, but only three were bilaterally deaf. Although he did not have a control group, he cited other studies of the general population and concluded that "the hearing status of this group is similar to that found in the general population, when the age and sex are considered."

Hearing Impairment and Juvenile Delinquency

Many studies have examined hearing impairment among juvenile delinquents, although none has specifically addressed prelingual deafness. Hauck and Sisson⁴⁰ found seriously impaired hearing among 8.4 percent of 201 institutionalized delinquent boys and girls but reported no normative data. Kelley⁴¹ studied 296 boys by a whisper and watch test at a state school for juvenile delinquents in Texas. He found that 10 percent had "more or less defective" hearing.

Slawson⁴² found that 4.0 percent of 1,648 delinquent boys in four New York institutions had "defective hearing," while 0.4 percent of 243,416 New York City parochial school children and 1.1 percent of 2,284 Albany first and fifth grade school children had defective hearing. However, he emphasized that the control sample of school children was composed of boys and girls from different socioeconomic backgrounds than the delinquents. Phillips⁴³ believed that the deafened child "not infrequently becomes delinquent," but cited no quantitative data. Burt,⁴⁴ citing Healy,³⁴ referred to partial deafness as "moral exile" and believed that the "congenital deaf-

mute . . . may at times prove exceedingly recalcitrant" due to an "unstable nervous temperament." Molitch and Adams⁴⁵ found almost identical incidences of defective hearing among 480 boys in a state house for boys and among 606,549 New York school children. However, they found approximately 2.5 times the base incidence of defective hearing among those boys who had institutional problems or parole violations and 3.5 times the base incidence of defective hearing among "psychopathic children."

Springer⁴⁶ had teachers complete rating scales to study 377 deaf and 415 hearing children from three New York City public schools and residential schools for the deaf. He found that the deaf boys tended to demonstrate more temper outbursts and stealing than hearing boys. Wallace⁴⁷ examined 166 boys and 34 girls who were juvenile delinquents and concluded that "there is apparently no greater incidence of hearing defects among delinquents than among average school children." However, he did not offer quantitative data in support of this statement. Such was the state of knowledge regarding hearing impairment and juvenile delinquency prior to World War II.

Unfortunately, advances in research methods since World War II have not resulted in substantial advances in research in this area. Glueck and Glueck⁴⁸ studied 500 delinquent boys and 500 nondelinquent boys who were closely matched for "age, general intelligence, national (ethnico-racial) origin, [and] residence in underprivileged neighborhoods." They found no statistically significant difference in the incidence of "deafness, marked or slight" or of otitis media between the delinquents and nondelinquents. Barker⁴⁹ reviewed part of the literature on the relationship between juvenile delinquency and hearing impairment and concluded that "there is no strong association between delinquency and deafness."

Kodman *et al.*⁵⁰ reported that 18.0 percent of 306 institutionalized delinquent boys and girls were hearing impaired as compared with 6.4 percent of school children in the same state tested by identical audiologic techniques. Although they reported a statistically significant difference, they pointed out that the delinquents tested were not a random sample of those in the institution.

Johnson⁵¹ studied 889 individuals in residential state schools for juvenile delinquents by audiometry and found that 115 (12.9 percent) had "medically significant hearing loss." He found that those delinquents with such hearing loss were committed to a state school at an earlier age than hearing delinquents. His data also showed that 78.2 percent of the subjects had at least some "perceptive" hearing loss, presumably indicating central nervous system pathology.

Covey⁵² noted that 15 percent of one population of delinquent children

and 13.2 percent of another population of unselected delinquents had significant hearing losses. Harvey⁵³ found that 35 percent of a sample of Mexican delinquents and 19 percent of a sample of American delinquents had defective hearing.

Cozad and Rousey⁵⁴ studied institutionalized delinquents and found hearing impairment among 29.2 percent of the boys and 12.5 percent of the girls, but did not report normative data for the techniques used. They noted that all hearing losses were of the sensorineural or mixed varieties, thus suggesting a neurological basis for their hearing losses. Slavin⁵⁵ cited data from an audiologic study of 48 noninstitutionalized delinquents under juvenile court jurisdiction that seem to show normal hearing acuity and speech discrimination, but impairment in auditory discrimination and other auditory performances.

The Task Force on Speech Pathology and Audiology Service Needs in Prisons⁵⁶ cited several unpublished and published studies showing that the incidence of hearing impairment among various groups of delinquents and adult offenders was between 37 and 69 percent. The Task Force members concluded that "despite differences in methodology among studies . . . the incidence of speech, hearing, and language disorders is significantly greater for juvenile delinquents and adult prison inmates than in the general population." The Task Force subsequently offered what was described as a conservative estimate that "10-15 percent of prison inmates have speech, hearing, or language disorders severe enough to warrant speech pathology/audiology services. This contrasts with equally conservative estimates of 3-5 percent for the general population." However, the Task Force conducted no original research and relied on many uncontrolled and methodologically flawed studies. Additionally, the Task Force reached its conclusions despite the contrary conclusion of at least one author upon whose work it relied⁵⁹ and it ignored another author's alternative explanations for the apparent finding of an increased incidence of hearing disorders among certain populations of delinquents.⁵⁷ The Task Force also misinterpreted one study⁵⁸ that did not evaluate the "antisocial (criminal) groups" as reported by the Task Force. Penner⁵⁹ also relied on several published and unpublished studies, including the Task Force report, to reach the same conclusions as that report.

Conclusion

The many studies that have been undertaken attest to the fact that the hypothesis of an association between hearing impairment and criminality or delinquency is recurrent. Unfortunately, none of the previously reported studies has considered the age of onset of the hearing impairment. Moreover,

none has studied the relationship between hearing impairment and criminality with sufficient rigor to conclusively test the hypothesis. Several authors have suggested concomitant neurologic damage among deaf offenders.^{34,44,51,54} Thus, in subsequent efforts to test this hypothesis it would be important to control for a history of head trauma or central nervous system disease, both of which are believed to be common antecedents of juvenile delinquency.⁶⁰ It also would be important to control for low socioeconomic status and social isolation, both of which are associated with prelingual deafness.⁶¹

The prelingually deaf are overrepresented among patients in civil and security mental hospitals. We believe that this reflects the fact that the leading causes of prelingual deafness are also among the leading causes of neurologic damage and mental retardation.¹² Neurologic damage and mental retardation account at least partly for the impulse, psychotic, and behavioral disorders among such deaf persons.⁶² Although no definitive research has yet been done, the available evidence leads us to the opinion that prelingual deafness *per se* does not contribute substantially to criminality. Any claim that prelingual deafness is associated with higher than average rates of criminal behavior must take into account the possibility that deafness decreases the probability of evading apprehension and the fact that prelingual deafness is associated with other factors known to be associated with criminality, such as deficits in brain functioning, educational underachievement, low social status, social isolation, and unemployment.

References

1. Mykelbust H: The Psychology of Deafness. New York, Grune & Stratton, 1964
2. Vernon M: Multiply Handicapped Deaf Children: Medical, Education and Psychological Considerations. Washington, DC, Council for Exceptional Children, 1969
3. Cohen B: Emotionally disturbed hearing-impaired children: A review of the literature. *Am Ann Deaf* 125:1040-1048, 1980
4. Litoff SG, Feldman VJ: Treatment issues with deaf children: An Ericksonian perspective, in *Deafness and Mental Health*. Edited by Stein LK, Mindel ED, Jabaley T. New York, Grune & Stratton, 1981, pp. 65-77
5. Meadow KP: Studies of behavior problems of deaf children, in *Deafness and Mental Health*. Edited by Stein LK, Mindel ED, Jabaley T. New York, Grune & Stratton, 1981, pp. 3-22
6. Klaber M, Falek A: Delinquency and crime, in *Family and Mental Health Problems in a Deaf Population*. Edited by Rainer J, Altshuler K, Kallman F, et al. New York, Columbia University Press, 1963, pp. 141-151
7. Blonde DJ, Fox A, Tharen L: Is Justice Deaf? A Report on Law and the Deaf. Windsor, Ontario, Legal Assistance of Windsor, 1978, pp. 65-84
8. Gruss L: The legal position of the deaf in present-day society. *Volta Rev* 42:826-874 (passim), 1940
9. Gruss L: The legal position of the deaf in present-day society. *Volta Rev* 43:29-76 (passim), 1941
10. Denmark J: Mental illness and profound early deafness. *Br J Med Psychol* 39:117-124, 1968
11. Remvig J: Deaf mutism and psychiatry. *Acta Psychiat Scand Suppl* 210:9-64, 1969
12. Vernon M, Rothstein DA: Prelingual deafness: An experiment of nature. *Arch Gen Psychiatry* 19:361-369, 1968
13. Peet HP: On the legal rights and responsibilities of the deaf and dumb. *Am J Insanity* 13:97-171, 1856
14. *R. v. Stafford Prison (Governor)*. Ex p. Emery, 14 Digest 2499 (1909) (Case no. 2500)
15. *R. v. Roberts*, 2 All England Reports 340 (1953)
16. *People ex rel. Myers v. Briggs*, 46 Ill. 2d. 281 (1970)
17. Tidyman E: *Dummy*. Boston, Little, Brown and Co., 1974

Offenders in a Silent World

18. *Jackson v. Indiana*, 406 U.S. 715 (1972)
19. Pizam H: On the legal capacity of the deaf-mute in Jewish law. *Int J Med Law* 1:347-354, 1980
20. Gaw AC: *The Legal Status of the Deaf: The Development of the Rights and Responsibilities of Deaf-Mutes in the Laws of the Roman Empire, France, England, and America*. Washington, DC, Gibson Brothers, 1907, pp. 93-105
21. Best H: *Deafness and the Deaf in the United States*. New York, MacMillan, 1943, pp. 296-326
22. Myers LJ: *The Law and the Deaf*. Washington, DC, Rehabilitation Services Administration, 1967, pp. 130-132
23. Vernon M, Coley J: Violation of constitutional rights: The language impaired person and the Miranda warnings. *J Rehabil Deaf* 11:1-8, 1978
24. Bourque PC: Admissibility of statements made by deaf accused. *Crim Law Q* 20:238-249, 1977-1978
25. Blonde DJ, Fox A, Tharen L: *Is Justice Deaf? A Report on Law and the Deaf*. Windsor, Ontario, Legal Assistance of Windsor, 1978, pp. 71-74
26. Schein JS, Delk MT Jr: *The Deaf Population of the United States*. Silver Springs, MD, National Association of the Deaf, 1974
27. Remvig J, Stürup G: Dovstumme lovovertædere i social-psykiatrisk belysning, I. *Nord T Krimin- alvidenskab* 45:177-193, 1957
28. Remvig J, Stürup G: Dovstumme lovovertædere i social-psykiatrisk belysning, II. *Nord T Krimin- alvidenskab* 45:316-333, 1957
29. Lombroso C: *Homme Criminel*. Paris, 1895
30. Lombroso C, Ferrero W: *The Female Offender*. New York, D. Appleton and Co., 1903
31. Tarnowsky P: *Étude Anthropometrique sur les Prostituées et les Voleuses*. Paris, 1887
32. Drahts A: *The Criminal: His Personnel and Environment—A Scientific Study*. New York, MacMillan, 1900, p. 78
33. Ellis H: *The Criminal*. New York, Scribner and Welford, 1890, p. 118
34. Healy W: *The Individual Delinquent*. Boston, Little, Brown and Co., 1929, pp. 222-223
35. von Hentig H: *The Criminal and His Victim: Studies in the Sociobiology of Crime*. New York, Schocken Books, 1979, p. 84
36. Walle EL, Morris PL: Hearing and speech research and therapy with sociopathic criminals. *Hear Speech News* 35:8-12, 1967
37. Walle EL, Kandel A, Boslow HM, et al: The incidence and severity of communication problems in a sociopathic criminal population. *Correctional Psychologist* 4:71-79, 1971
38. Anonymous: Hearing and speech behind bars. *Hear Speech News* 39:4-7, 1971
39. Melnick W: Hearing impairment in an adult penal institution. *J Speech Hear Disorders* 35:173-181, 1970
40. Hauck AA, Sisson EO: Report of sensory and mental tests at the Idaho Industrial Training School. *School Society* 4:410-416, 1916
41. Kelley TL: *Mental Aspects of Delinquency*. University of Texas Bulletin, No. 1713, March 1, 1917
42. Slawson J: *The Delinquent Boy: A Socio-Psychological Study*. Boston, Richard G. Badger, 1926, pp. 317-321
43. Phillips WC: The application of medical and social science to the problems of acquired deafness. *Arch Otolaryngol* 12:1-13, 1930
44. Burt C: *The Young Delinquent*. New York, D. Appleton and Co., 1931, pp. 273-274
45. Molitch M, Adams EM: Hearing defects in behavior problems. *J Juvenile Res* 20:15-19, 1936
46. Springer NN: A comparative study of the behavioral traits of deaf and hearing children in New York City. *Am Ann Deaf* 83:255-273, 1938
47. Wallace EW: Physical defects and juvenile delinquency. *NY State J Med* 40:1586-1590, 1940
48. Glueck S, Glueck E: *Unraveling Juvenile Delinquency*. New York, Commonwealth Fund, 1950, pp. 175-176
49. Barker RG: *Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability*. New York, Social Science Research Council, 1953, pp. 212-213
50. Kodman F Jr, Lieberman L, Byers VW, et al: Some implications of hearing defective juvenile delinquents. *Except Child* 25:54-67 (passim), 1958
51. Johnson WE: *A Study of the Academic Achievement, Childhood Diseases, and the History of Delinquency in Relation to the Onset of Hearing Loss among a Group of Hard-of-Hearing Delinquent Children*. University of Texas, Unpublished PhD dissertation, 1960
52. Covey HW: Impaired hearing and juvenile delinquency. *Los Amigos* 9:1-2, 1945
53. Harvey L: The delinquent Mexican boy. *J Educ Res* 26:173-185, 1948
54. Cozad R, Rousey C: Hearing and speech disorders among delinquent children. *Corr Psychiat J Soc Ther* 12:250-255, 1966
55. Slavin SH: Information processing defects in delinquents, in *Ecologic-Biochemical Approaches to Treatment of Delinquents and Criminals*. Edited by Hippchen LJ. New York, Von Nostrand Reinhold, 1978, pp. 75-104
56. Task Force on Speech Pathology and Audiology Service Needs in Prisons: *Task Force Report on*

Speech Pathology/Audiology Service Needs in Prisons. Rockville, MD, American Speech-Language Hearing Association, 1973

57. Spiro J: The Incidence of Speech and Hearing Problems in a Female Delinquent Population. Unpublished Master's Thesis, Catholic University of America, 1973
58. Lamb L, Graham J: Audiometric testing in a psychiatric hospital. *J Aud Res* 2:339-350, 1962
59. Penner MJ: The role of selected health problems in the causation of juvenile delinquency. *Adolescence* 17:347-368, 1982
60. Lewis DO, Balla DA: *Delinquency and Psychopathology*. New York, Grune & Stratton, 1976
61. Vernon M: Sociological and psychological factors associated with hearing loss. *J Speech Hear Res* 12:541-563, 1969
62. Vernon M: The final report, in *Psychiatric Diagnosis, Therapy and Research on the Psychotic Deaf*. Edited by Grinker RR. Washington, DC, U.S. Government Printing Office, 1971, pp. 13-39