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A SURVEY OF THE HEARING AND
SPEECH PROBLEMS OF 232 BOYS
IN THE BOYS' VOCATIONAL
SCHOOL AT LANSING, MICHIGAN

Thesis for the Degree of M. A.
MICHIGAN STATE COLLEGE
William Kennedy Lee
1947

This is to certify that the

thesis entitled

"Survey of the Hearing and Speech
Problems of 232 Boys in the State
Boys Vocational School at Lansing,
Michigan"

presented by

William Lee

has been accepted towards fulfillment
of the requirements for

Master of Arts degree in Speech, Dramatics
and Radio

Lucia Morgan Nelson
Major professor

Date August 22, 1947

A SURVEY OF THE HEARING AND SPEECH PROBLEMS
OF 232 BOYS IN
THE BOYS' VOCATIONAL SCHOOL AT LANSING, MICHIGAN

by

WILLIAM KENNEDY LEE

A THESIS

Submitted to the Graduate school of Michigan
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THESIS

INTRODUCTION

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LIST OF CHARTS

- | | |
|--------|--|
| 1 | Pure tone hearing test form. |
| 11 | Speech record blank. |
| 111 | Examiners example card. |
| 1V | Alphabetical listing of all boys tested at the Boys' Vocational School showing Intelligence Quotients, Hearing Loss, and Speech Defects. |
| V & Va | Listing of boys with hearing losses according to the degree of loss. |
| V1 | Listing of boys showing hearing loss, factors affecting the test, and history affecting hearing. |
| V11 | Percentage of cases in the Boys' Vocational School in each classification of speech defect. |
| V111 | Comparison of percentage of speech defects of Ingham County, Madison, Wisconsin, and the Boys' Vocational School. |

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|----|--|
| 1 | Percentage of boys in the Boys' Vocational School having speech defects and the percentage in each classification of speech defect. |
| 11 | Comparison of the percentage of speech defects of school children in Ingham County, Michigan, Madison, Wisconsin, and the Boys' Vocational School. |

CHAPTER 1

STATEMENT OF PROBLEMS

1. To make a survey of the hearing problems of the boys in the Boys' Vocational School in Lansing, Michigan.
2. To make a survey of the speech problems of the boys in the Boys' Vocational School in Lansing, Michigan.
3. To compare the findings with those of a typical public school.

METHOD OF PROCEDURE

Interest was aroused in this project through the results of a sampling of speech problems done at the Boys' Vocational School in Lansing, Michigan, in 1941, by Mrs. Lucia Morgan Nesom. This sampling was done at the request of the School administrators who believed that their pupils showed a high percentage of speech defects. Permission to conduct a complete survey was, therefore, readily granted to the author. Since hearing is an integral part of speech, a hearing survey was also conducted.

The following procedure, which would best suit the needs of the examiner and least disturb the routine of the school, was drawn up in a conference with the principal.

An individual sweep test with a MAICO pure tone audiometer was made by classrooms. The sweep test consisted of an initial explanation to the whole room telling what was to be done, why it was being done, how it was to be done, what the boys could expect from the examiner, and what the examiner wanted from the boys. This explanation varied with grade differences or when it seemed advisable to establish rapport.

As each boy was tested, he was seated so he could not see the manipulation of the audiometer dials. The decibel loss control on the audiometer was set at ten decibels, as any decibel loss below that is negligible, and each frequency cycle between 128 cycles (256, 512, 1024, 2048, 2896, 4096, 5782, 8192) and 11584 cycles was tested. The order of frequency progression was varied and the tone interrupter was used to make certain the boy was hearing what he indicated and had not just "caught on" to the method of testing. Each boy who indicated a loss in

any of the frequency cycles was scheduled for a complete hearing test at a later date.

When all the available boys had been given the sweep test, each of those whose record showed a ten decibel loss in any frequency cycle was given a complete hearing test with a MAICO pure tone audiometer. This test was given in an empty room with the elimination of all possible disturbing noises and activity.

An office boy assigned to the examiner brought the boys into the room one at a time. An exact testing of each frequency cycle was made and recorded on an audiogram. The testing conditions and the cooperation of the boy was indicated during the testing procedure. As in the sweep test, the order of testing the frequency cycles was altered so as to eliminate errors of chance and attempted deceit. Each boy was also asked the following questions, and the answers were noted on the audiogram:

1. Do you now have an ache in either ear?
How long has it lasted?
Have you ever had an ache in either ear? When?
How often do you have ear aches?
2. Do you now have any noises such as buzzing,
ringing, or roaring in either ear?
How long has it lasted?
Have you ever had any noises in either ear? When?
How often do you have noises in your ears?
3. Is either of your ears running now?
How long has it run?
Has either of your ears ever run? When?
How often do your ears run?
4. Have you ever been to a doctor to have him look
at your ears? When? What did he say?
5. Have you ever had measles, mumps, scarlet fever,
whooping cough, a severe attack of influenza, or
pneumonia? When? Do you have frequent colds?
6. Does any member of your family have a hearing
loss? What relation?

See Chapter 11 for the results of this testing.

The speech survey was done by grade and room. A table was set up in the hall outside the classroom door with the boys seated opposite the examiner. When one boy returned to his room another immediately took his place.

The boys were not told their speech was being tested. As they sat down at the table their name was checked off a list provided for this purpose by the principal's office. The majority of the boys were already familiar with the examiner and cooperated readily.

An accurate check of specific sounds and sound blends was assured by using an adaptation of the "Speech Improvement Cards" by Bryngelson and Glaspey.¹ This test consists of sixteen cards, $4\frac{1}{2}$ inches by 6 inches, with three pictures on a card. The correct response to each picture contains the sound being tested. To insure understanding of the procedure, three figures prepared by the examiner were first shown to each boy. With the first figure this statement was made. "If I were to show you this and ask you what it was, you would tell me it was a star." The boy was then asked what the next two figures were. All misunderstanding was eliminated before the test began. Each boy was then asked to tell what was on the cards which were placed before him. The speech record blank² which accompanies these test cards was also adapted for this survey. All sound deviations were noted on this form opposite the printed response word as they occurred.

Fluency was tested while establishing rapport when the examiner asked

-
1. Bryngelson and Glaspey, Speech Improvement Cards, Form A, Scott, Foresman and Company, 1941.
 2. Ibid.

questions regarding hobbies, sports, school, movies, and work details, or listened while information was volunteered. Specific sound deviations were also checked at this time. Structural deviations were noted by an examination of the oral cavity. These included tooth gap, missing teeth, malformed teeth, malocclusion of the jaw, high palatal arch, cleft palate, cleft lip, enlarged tongue, short frenum, and enlarged or infected tonsils. Ability to manipulate the jaw, protrude and retract the lips, and agility of the tongue were also checked and noted on the chart.

The following grouping was used to classify deviations.

ARTICULATION	: Incorrect formation of consonants. Lateral s Hissing s
SOUND SUBSTITUTIONS, ADDITIONS, AND OMISSIONS	: f for θ - tif/tiθ : added to - lɒmp/lɒmp : leaving out a sound - souɪz/souliɪz
VOICE - FUNCTIONAL	: Pitch incongruous with age and sex; unpleasant voice qualities including thin and weak, tense, breathy, husky, denasal and nasal.
DIALECT	: Foreign accents; deviations from standard general American speech.
ORAL INACTIVITY	: Improper manipulation of the articulatory mechanisms.
STUTTERING (FLUENCY)	: Noticable hesitations and blocking in vocalization resulting in inability to express ones self in the accepted fluency pattern of speech.
VOCAL - STRUCTURAL	: Those qualities described above in vocal-functional but known to be caused by malformation of any or a combination of articulatory mechanisms, or an uncontrollable blocking of a resonating chamber.
HARD-OF-HEARING-SPEECH	: Monotonous pattern of speech with

inability to sustain pitch
and volume changes.

All materials, including the picture cards and topics to test fluency, were discussed with a psychologist from the Boys' Vocational School to insure appropriateness. The results of this survey are shown in following charts and graphs.

CHAPTER 11

PURE TONE HEARING TEST
MICHIGAN DEPARTMENT OF HEALTH
Bureau of Maternal and Child Health
Hearing Testing Service

CHART II

SECRET TAND SLAM

Adapted from *Encyclopedia*

C. . .

4. . .

Name	Sex	Race	Age	Grade
------------	-----------	------------	-----------	-------------

School.....Teacher.....Date.....

Net test rate.....

Key: Mark substitutions with sound substituted; omissions (-); indistinct (ind.)

[illegible]

CHART 1V

An alphabetized listing of all boys tested at the Boys' Vocational School in Lansing, Michigan, showing the Intelligence Quotient, the name of the test from which it was computed, and the percentage of hearing loss in both the right and left ear. The chart also indicates whether the boy had a speech defect in any of the following classifications: Articulation, Sound Deviation, Vocal-Functional; Dialect, Oral Inactivity, Stuttering, Vocal-Structural, or Hard-of-hearing-speech. Under the classification of Sound Deviations, the substitution, addition and omission are noted as they occurred during the examination.

Blanks in the Intelligence Quotient column occur because case history files on those boys were either incomplete or non-existent.

EXPLANATION OF SYMBOLS

- B Stanford-Binet
- WB Wechsler-Bellevue
- AP Arthur Point Performance Scale
- SPA Standard Progressive Achievement Test
- SRA Science Research Associates
- GA Grace-Arthur Performance Scale
- O Otis
- ? The numerical figure appeared on the psychological summary sheet but the test name was not indicated.
- A "Average Intelligence" - so stated in the psychological reports without stating the numerical equivalent.
- HA "High Average Mental Ability" - so stated in the psychological reports without stating the numerical equivalent.
- N "Normal Intelligence" - so stated in the psychological reports without stating the numerical equivalent.
- x Shows the presence of a speech defect of the type indicated by the column heading.
- / The word or symbol preceding was substituted for the word or symbol which follows.

CHART IV

	I Q	HEARING LOSS % RIGHT % LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCTIONAL	DIAL- ECTS	ORAL INACT IVITY	STUTTE RING	HARD OF HEAR
Adams, John	91 B	1.2	6.8	x	x		x	x	
Aiston, Thomas	130 B	6.4	6.4	x	s/θ : l				
Alexanders, Edward	83 B			x	f/θ : r	x	x		
Anderson, Clarence	75 B	11.6	6.4						
Anderson, Robert	77 O			x					
Andrews, Robert	97 B			x					
Ashley, Kenneth				x					
Beals, Raymond	108 WB			x	w/l				
Bell, Howard	106 SPA	3.2	7.2						
Bencheck, Robert	92 GA	10.0	8.4	x					
Benning, Robert	N SPA	1.6	8.8	x					
Betras, James	80 B	6.4	8.4						
Boisvert, Francis	101 B			x	l				
Bradley, Raymond	108 B				s/tf				
Bridges, Vodra	80 WB	8.4	9.2						
Britvec, Peter	99 WB								x
Brown, Mark		8.0	8.8	x	s/s				
Brunk, George	98 WB			x		x			
Bugis, John	102 ?			x	s/θ : s/θ : l				
Byrd, Clarence	77 B			x	f/θ : θ : r	x			
Cartwright, Willie	83 WB			x	cl/θ : θ : r	x			
Cassady, James		10.0	6.8						
Cetnarowski, Chester	HA SPA				t/θ				
Chamberlain, Donald	111 B	2.4	6.4						
Charabee, Vincent	97 WB			x					
Christensen, Earl	127 B			x					
Clark, Arthur	93 B			x					
Clark, Willie	84 B	8.4	8.0	x	ou/ou : k : r	x			
Clayton, Fred	75 ?			x					
Coolsen, Raymond	106 WB	6.4	8.4						
Cooney, Frank	76 B	6.8	3.6	x	ε / ε l : a / a r : θ	x			

CHART IV

	I	Q	HEARING % RIGHT	LOSS % LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCT- IONAL	DIAL- EGTS	ORAL INACT- IVITY	STUTT- ERING	VOCAL STRUC- TURAL	HARD OF HEAR.
Cooper, Thomas		77 B	10.8	14.4	x	s/						
Coutts, David		97 WB	7.6	7.2								
Cresswell, Charles		125 B					x					
Croschere, Richard		82 B					x					
Davidson, Andrew		82 B			x	f/θ: l;		x				
Davis, Earl		85 B			x	^/3: f/θ: l; r		x				
Davis, Eddie Lee		79 WB			x	æ/ε: f/θ: s/		x				
Davis, James		79 WB	10.4	4.8								
Dean, Robert		78 B			x							
DeFauw, Matthew		104 WB			x							
DeShong, Earl		102 WB	7.2	12.0								
Donald, LeRoy		79 f			x	f/θ		x				
Douglas, Gordon		75 B	4.4	4.4	x	t/θ			x			
Durham, William		91 WB	3.6	4.0	x	θ/s: θ/						
Dyke, Burnett		97 WB	6.2	11.2	x		x					
Eaton, Charles			1.6	3.6								
Edman, Donald		88 B	10.0	13.2	x							
Ellicessor, Lloyd		79 B			x							
Ellicessor, William		68 B			x	w; r						
Evans, Lyle		101 B	3.8	10.8								
Felsner, Ralph		114 B					x					
Felts, Hugh		119 WB					x		x			
Fenner, Ronald		102 B			x							
Finn, Jack		101 WB			x							
Flatt, Jerry		95 WB			x	l	x				x	
Foristeri, Anthony		102 WB			x							
Fritz, Elmer		98 WB	10.4	10.0								
Garcia, Emil		82 B	3.6	6.4								
Gardner, Arnold		108 B	2.8	3.6								
Geierman, Joseph		125 B			x							
Genson, Gordon		107 WB			x							

CHART IV

	I	Q	HEARING %RIGHT	LOSS %LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCT- IONAL	DIAL- ECTS	ORAL INACT- IVITY	STUTT- ERING	VOCAL STRUC- TURAL	HARD OF HEAR.
Cooper, Thomas	77	B	10.8	14.4	x	s/						
Coutts, David	97	WB	7.6	7.2								
Cresswell, Charles	125	B					x					
Croschere, Richard	82	B					x					
Davidson, Andrew	82	B				f/θ: l; ^/3: f/θ: l; r		x				
Davis, Earl	85	B			x	æ/ε: f/θ: s/		x				
Davis, Eddie Lee	79	WB			x							
Davis, James	79	WB	10.4	4.8								
Dean, Robert	78	B			x							
DeFauw, Matthew	104	WB			x							
DeShong, Earl	102	WB	7.2	12.0								
Donald, LeRoy	79	?			x	f/θ		x				
Douglas, Gordon	75	B	4.4	4.4	x	t/θ			x			
Durham, William	91	WB	3.6	4.0	x	θ/s: θ/s/						
Dyke, Burnett	97	WB	6.2	11.2	x		x					
Eaton, Charles			1.6	3.6								
Edman, Donald	88	B	10.0	13.2	x							
Ellicessor, Lloyd	79	B			x							
Ellicessor, William	68	B			x	w: r						
Evans, Lyle	101	B	3.8	10.8								
Felsner, Ralph	114	B					x					
Felts, Hugh	119	WB					x		x			
Fenner, Ronald	102	B			x							
Finn, Jack	101	WB			x							
Flatt, Jerry	95	WB			x	l	x				x	
Foristeri, Anthony	102	WB			x							
Fritz, Elmer	98	WB	10.4	10.0								
Garcia, Emil	82	B	3.6	6.4								
Gardner, Arnold	108	B	2.8	3.6								
Geierman, Joseph	125	B			x							
Genson, Gordon	107	WB			x							

1. The first part of the document is a list of the names of the members of the committee, which is headed by the Chairman, Mr. J. H. ...
 2. The second part is a list of the names of the members of the committee, which is headed by the Chairman, Mr. J. H. ...
 3. The third part is a list of the names of the members of the committee, which is headed by the Chairman, Mr. J. H. ...
 4. The fourth part is a list of the names of the members of the committee, which is headed by the Chairman, Mr. J. H. ...
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CHART IV

	I	Q	HEARING %RIGHT	LOSS %LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCTIONAL	DIAL- ECTS	ORAL INACT- IVITY	STUTT- ERING	VOCAL STRUC- TURAL	HARD OF HEAR.
Cooper, Thomas	77	B	10.8	14.4	x	s/						
Coutts, David	97	WB	7.6	7.2								
Cresswell, Charles	125	B					x					
Croschere, Richard	82	B					x					
Davidson, Andrew	82	B			x	f/θ: l;		x				
Davis, Earl	85	B			x	^/3: f/θ: l; r		x				
Davis, Eddie Lee	79	WB			x	æ/ε: f/θ: s/		x				
Davis, James	79	WB	10.4	4.8								
Dean, Robert	78	B			x							
DeFauw, Matthew	104	WB			x							
DeShong, Earl	102	WB	7.2	12.0								
Donald, LeRoy	79	?			x	f/θ		x				
Douglas, Gordon	75	B	4.4	4.4	x	t/θ			x			
Durham, William	91	WB	3.6	4.0	x	θ/s: θ/						
Dyke, Burnett	97	WB	6.2	11.2	x		x					
Eaton, Charles			1.6	3.6								
Edman, Donald	88	B	10.0	13.2	x							
Ellicessor, Lloyd	79	B			x							
Ellicessor, William	68	B			x	w; r						
Evans, Lyle	101	B	3.8	10.8								
Felsner, Ralph	114	B					x					
Felts, Hugh	119	WB					x		x			
Fenner, Ronald	102	B			x							
Finn, Jack	101	WB			x							
Flatt, Jerry	95	WB			x	l	x				x	
Foristeri, Anthony	102	WB			x							
Fritz, Elmer	98	WB	10.4	10.0								
Garcia, Emil	82	B	3.6	6.4								
Gardner, Arnold	108	B	2.8	3.6								
Geleman, Joseph	125	B			x							
Genson, Gordon	107	WB			x							

CHART IV

	I	Q	HEARING %RIGHT	LOSS %LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCTIONAL	DIAL- ECTS	ORAL INACT- IVITY	STUTT- ERING	VOCAL STRUC- TURAL	HARD OF HEAR.
Gibson, Charles	69	B	12.0	5.2	x		x					
Gillam, Russell	87	WB			x	ɔɪ / ɛ; ɪ		x				
Gloster, Albert	82	WB			x							
Gordon, LeRoy	93	B	10.8	9.6	x		x					
Grievies, Edison	76	WB			x					x		
Hall, Ronald	75	B	8.0	13.2	x						x	
Hall, Willard	86	WB			x	t/θ						
Hardy, Francis	105	WB	5.6	7.2	x							
Hargo, Maynard	68	AP	10.8	14.0								
Harmerier, Bernard	73	WB			x							
Harper, Irwin	73	B	8.0	20.0	x	f/θ; θ/tʃ; θ/ʃ						
Harper, Leuriggle	99	B	4.8	3.6	x	iɛ / ɛ; θ/s	x	x				
Harris, Lawrence	85	B			x							
Haun, Earl					x	v/f; r; ɪ						
Hitchcock, Keith	83	B	10.0	1.2								
Hoeve, Joseph			19.2	11.2	x	s/ʃ;	x					
Hoonstra, David			6.4	9.6								
Hoonstra, James			3.6	10.4	x	ɪ	x					
Horvath, Thomas	96	B	23.6	56.0								
Hotchiss, Robert	74	WB			x				x			
Howell, Ronald			32.4	50.4								
Hughes, Herman	71	B			x	f/θ; θ/s; ɪ						
Hunt, David			6.0	6.0								
Hytinen, Ronald	78	B	4.8	6.2								
Jacobus, Louis			22.4	38.0								
Jenkins, Clyde			20.4	22.0								
Jenkins, Eugene			8.0	11.6	x							
Johnson, Walter	110	B	9.2	3.6	x		x					
Joslyn, Arthur	97	WB					x					
Kenaziz, Robert	83	B			x		x					
Karin, Ronald	92	B	42.0	28.4	x							

CHART IV

	I	Q	HEARING LOSS		ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCTIONAL	DIAL- ECTS	ORAL INACT- IVITY	STUTT ERING	VOCAL STRUC- TURAL	HARD OF HEAR.
			% RIGHT	% LEFT								
Kennedy, Daniel			7.7	10.4								
Killips, Robert		92 B	3.2	5.6	x		x					
King, Gary		99 WB			x	l						
King, Jessie		93 B	10.0	13.6	x							
Kitchen, David		93 B			x							
Kitchen, Wayne		81 B			x	s/θ						
Kurburski, Ralph		72 B			x	l		x				
LaGrange, Robert		97 B	25.6	17.6	x							
Lakenta, Eugene		100 WB	10.0	7.6	x			x				
Lantz, Robert					x							
Lasco, Milton		92 B	10.0	9.2	x	θ/s	x					
Lason, Arvil		76 B	32.8	25.2	x							
Lenart, Edward		71 B	4.4	11.6	x	ts/tʃ; l						
Lewis, Donald		119 B			x							
Lorig, Arthur		108 B	5.2	4.4	x	l	x					
Lutrov, Bruno		95 B	17.0	7.2								
McDonald, Carlton		116 WB			x			x				
McLaren, Bruce		77 ?	14.8	12.0								
McLeod, Francis		78 AP	6.8	10.0	x							
Magyer, Matthew		95 WB			x	t/θ; r	x					
Malone, James			5.6	4.4								
Martin, Peter		90 SRA	5.6	9.6	x							
Masters, Sidnia		86 B	6.0	8.0								
Merglewski, Jerry		107 WB			x							
Miller, Samuel		88 B			x							
Morris, Paris		95 B			x	f/θ; t/ε; ɔ/r		x				
Munroe, Arthie		102 WB			x							
Nablo, Raymond			6.4	9.6								
Nelson, Leon		91 B				d/θ			x			
Oakly, Tracy		106 B	16.8	12.4			x					
Olsen, James		89 B			x		x					
Perry, James			7.6	5.6	x	s/ʃ						

CHART IV

	I	Q	HEARING % RIGHT	LOSS % LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCTIONAL	DIAL- ECTS INACTIVITY	ORAL STUTT INACTIVITY	VOCAL STRUCTURAL	HARD OF HEAR
Peterson, Curtis	87	WB			x	θ/s; ε/qɪ		x			
Phillips, Robert			8.0	11.2							
Pokriefka, James	118	WB			x						
Pokriefka, Thomas	116	WB			x	t/θ; θ/s					
Preston, Lyle	111	B			x		x				
Prieur, August	96	?	10.0	7.6	x		x				
Prindle, Gerald	79	WB			x						
Pritchard, Claude	86	B	15.2	10.0							
Putman, Alvah	90	B	8.4	6.4							
Ramberg, Edward	103	B									x
Ramberg, Richard	77	WB			x	θ/s	x				
Reed, Robert			35.6	58.2	x	l					
Reid, Guy	86	WB			x						
Rheaume, Ronald	82	B	7.2	6.4							
Riederer, Frank	103	B	7.2	7.6	x						
Roberts, Maurice	86	WB	8.4	10.8	x	l					
Rohde, David	81	WB			x		x				
Roscoe, Robert	96	B			x		x				
Ross, Frank	108	B			x		x				
Rumsey, Daniel	106	WB			x						
Russell, Max	100	WB	6.8	10.8	x						
Sams, Leander			5.6	4.8							
Sanders, Lucious					x	θ/s; θ/x; l		x			
Sandusky, Keith	A	?			x	l; r					
Schmh, Harold			4.4	4.8							
Seitz, William	93	B	3.6	14.0	x	r; t/θ					
Severin, Edward	69	?	6.8	8.8	x	s/θ; d/θ; l					
Shaffer, Bernard					x						
Sherwood, George	67	B			x						
Sidell, Elbert	74	B			x	r; s/t/s					
Simon, Ellis	78	B	12.4	12.8	x	θI/x; q/dɪ		x			

CHART IV

	I	Q	HEARING % RIGHT	LOSS % LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL DIAL- FUNCTIONL	ORAL INACTIV- ITY	STUTTERING	VOCAL STRUC- TURAL	HARD OF HEAR.
Sinclair, Richard	91	WB	10.8	12.2							
Smith, John	88	B							x		
Smith, Ronel					x	s/					x
Snyder, August					x						
Stachowick, Thomas	94	B			x	$\theta/s; l$					
Stanley, Bernard	109	B			x		x				
Starr, Jerry	81	B			x		x				
Sterling, Edward	98	WB	7.6	6.0							
Strauchman, Donald	93	B	4.4	4.0							
Suarez, Benjamin	99	B			x	l	x				
Suarez, Frank			5.2	6.0	x	l					
Suhr, Harold	89	B			x						
Sylvester, Robert					x						
Symons, James	71	B	1.2	2.4							
Szczygiel, George	101	B	10.4	10.0	x	$t/\theta;$					
Tharp, Paul			2.4	9.6	x	$s/\theta; g$					
Theodorou, Robert			14.8	5.2							
Thomas, Russell	119	B	8.0	6.0							
Thompson, Joseph	80	B	4.0	7.2	x		x				
Tobias, Fred	77	B			x		x				
Tully, Herbert	85	WB			x	θ/s					
Vaughn, Robert					x						
Vickery, Richard			70.0	63.6							
Walford, Rodger			8.4	4.4							
Walker, George	89	B	3.6	1.6	x		x				
Waller, Richard	96	B			x						
Walton, Floyd			6.0	4.4							
Warr, James	65	WB	9.2	6.4							
Washington, Wallace	77	WB			x	$t/\theta; f/\theta;$		x	x		
Weinrich, John	105	B			x	s/θ					
West, John	95	B			x		x				

CHART IV

	I	Q	HEARING % RIGHT	LOSS % LEFT	ARTICU- LATION	SOUND DEVIATIONS	VOCAL FUNCTIONAL	DIAL- ECTS	ORAL INACTIV- ITY	STUTT- ERING	VOCAL STRUC- TURAL	HARD OF HEAR.
White, Ceasar	96	B			x							
Wiggins, George	85	B			x							
Wilk, Stanley	80	B			x	l	x					
Wilkinson, Frank	105	WB			x							
Williams, Card	80	B			x	gl						
Williams, Donald	102	WB			x							
Wilson, Norman	89	B	5.6	6.8		r	x					
Winnie, Robert			22.8	32.8	x							
Wise, Richard					x		x					
Wishum, James					x	t/θ : d/θ : f/θ s/t/θ : s/f			x			
Woodart, Edward	100	WB			x							
Wyman, Harold	108	B	15.6	9.6	x		x					

CHARTS V and V-a

Charts V and V-a show the percentage of hearing loss, in the right and left ear respectively, of 97 boys who were given a complete hearing test on a MAICO pure tone audiometer. On both charts the listings range from the lowest to the highest percentage of loss.

Data regarding speech defects of these boys may be found in Chart 1V on page 11.

CHART V

NAME	LOSS RIGHT EAR
Adams, John	1.2
Symons, James	1.2
Eaton, Charles	1.6
Benning, Robert	1.6
Chamberlain, Donald	2.4
Thaup, Paul	2.4
Gardner, Arnold	2.8
Bell, Howard	3.2
Killips, Ronald	3.2
Seitz, William	3.6
Hoornstra, James	3.6
Durham, William	3.6
Walker, George	3.6
Garcia, Emil	3.6
Evans, Lyle	3.8
Thompson, Joseph	4.0
Lenart, Edward	4.4
Strauchman, Donald	4.4
Schuh, Harold	4.4
Douglas, Gordon	4.4
Harper, Leuriggle	4.8
Hytinen, Ronald	4.8
Lorig, Arthur	5.2
Suarez, Frank	5.2
Wilson, Norman	5.6
Sams, Leander	5.6
Malone, James	5.6
Hardy, Francis	5.6
Martin, Peter	5.6
Walton, Floyd	6.0
Aunt, David	6.0
Masters, Sidney	6.0
Dyke, Burnett	6.2
Coolsen, Raymond	6.4
Aiston, Thomas	6.4
Hoornstra, David	6.4
Nablo, Raymond	6.4
Betras, James	6.4
Russell, Max	6.8
McLeod, Francis	6.8
Cooney, Frank	6.8
Severin, Edward	6.8
Riederer, Frank	7.2
DeShong, Earl	7.2
Rheaume, Ronald	7.2
Perry, James	7.6
Sterling, Edward	7.6
Coutts, David	7.6
Kennedy, Daniel	7.7

NAME	LOSS RIGHT EAR
Brown, Mark	8.0
Harper, Irwin	8.0
Phillips, Robert	8.0
Hall, Ronald	8.0
Jenkins, Eugene	8.0
Thomas, Russell	8.0
Putman, Alva	8.4
Walford, Rodger	8.4
Clark, Willie	8.4
Roberts, Maurice	8.4
Bridges, Vodra	8.4
Johnson, Walter	9.2
War, James	9.2
Edman, Donald	10.0
King, Jessie	10.0
Lekenta, Eugene	10.0
Bencheck, Robert	10.0
Prieur, August	10.0
Cassady, James	10.0
Lasco, Milton	10.0
Szczygiel, George	10.4
Hitchcock, Keith	10.4
Davis, James	10.4
Fritz, Elmer	10.4
Cooper, Thomas	10.8
Hargo, Maynard	10.8
Gordon, LeRoy	10.8
Sinclair, Richard	10.8
Hoeve, Joseph	11.2
Anderson, Clarence	11.6
Gibson, Charles	12.0
Simon, Ellis	12.4
McLaren, Bruce	14.8
Theodorou, Robert	14.8
Pritchard, Claude	15.2
Wyman, Harold	15.6
Oakly, Tracy	16.8
Lutrov, Bruno	17.0
Jenkins, Clyde	20.4
Jacobus, Louis	22.4
Winnie, Robert	22.8
Horvath, Thomas	23.6
LaGrange, Robert	25.6
Howell, Ronald	32.4
Lasson, Arvil	32.8
Reed, Robert	35.6
Karin, Ronald	42.0
Vickery, Richard	70.0

CHART V-a

NAME	LOSS LEFT EAR
Hitchcock, Keith	1.2
Walker, George	1.6
Symons, James	2.4
Eaton, Charles	3.6
Gardner, Arnold	3.6
Harper, Leuriggle	3.6
Johnson, Walter	3.6
Cooney, Frank	3.6
Durham, William	4.0
Strauchman, Donald	4.0
Douglas, Gordon	4.4
Lorig, Arthur	4.4
Malone, James	4.4
Walton, Floyd	4.4
Walford, Rodger	4.4
Schuh, Harold	4.8
Sams, Leander	4.8
Davis, James	4.8
Theodorou, Robert	5.2
Gibson, Charles	5.2
Killips, Ronald	5.6
Perry, James	5.6
Suarez, Frank	6.0
Hunt, David	6.0
Sterling, Edward	6.0
Thomas, Russell	6.0
Hytinen, Ronald	6.2
Chamberlain, Donald	4.4
Garcia, Emil	6.4
Aiston, Thomas	6.4
Rheume, Ronald	6.4
Putman, Alva	6.4
War, James	6.4
Anderson, Clarence	6.4
Adams, John	6.8
Wilson, Norman	6.8
Cassady, James	6.8
Bell, Howard	7.2
Thompson, Joseph	7.2
Hardy, Francis	7.2
Coutts, David	7.2
Lutrov, Bruno	7.2
Riederer, Frank	7.6
Lekenta, Eugene	7.6
Prieur, August	7.6
Masters, Sidney	8.0
Clark, Willie	8.0
Coolen, Raymond	8.4

NAME	LOSS LEFT EAR
Betras, James	8.4
Bencheck, Robert	8.4
Benning, Robert	8.8
Severin, Edward	8.8
Brown, Mark	8.8
Bridges, Vodra	9.2
Lasco, Milton	9.2
Thaup, Paul	9.6
Martin, Peter	9.6
Hoornstra, David	9.6
Nablo, Raymond	9.6
Ryman, Harold	9.6
Gordon, LeRoy	9.6
Pritchard, Claude	10.0
Fritz, Elmer	10.0
Szczygiel, George	10.0
McLeod, Francis	10.0
Hoornstra, James	10.4
Kennedy, Daniel	10.7
Roberts, Maurice	10.8
Evans, Lyle	10.8
Russell, Max	10.8
Hoeve, Joseph	11.2
Dyke, Burnett	11.2
Phillips, Robert	11.2
Lenart, Edward	11.6
Jenkins, Eugene	11.6
DeShong, Earl	12.0
Sinclair, Richard	12.0
McLaren, Bruce	12.0
Oakly, Tracy	12.4
Simon, Ellis	12.8
Hall, Ronald	13.2
Edman, Donald	13.2
King, Jessie	13.6
Seitz, William	14.0
Hargo, Maynard	14.0
Cooper, Thomas	14.4
LaGrange, Robert	17.6
Harper, Irwin	20.0
Jenkins, Clyde	22.0
Lasson, Arvil	25.2
Karin, Ronald	28.4
Winnie, Robert	32.8
Jacobus, Louis	38.0
Howell, Ronald	50.0
Horvath, Thomas	56.0
Reed, Robert	58.2
Vickery, Richard	63.6

CHART VI

Chart VI has a listing of boys with the percentage of hearing loss in both the right and left ears, the conditions under which the test was given, the cooperation of the boy, diseases which are known to affect hearing, whether his ears now ache or have ached, and whether he now has or has had noises in either ear.

Both the headings "Test conditions" and "Boys' cooperation" are marked g for good, f for fair, and p for poor. "Diseases" include measles, mumps, whooping cough, scarlet fever, severe influenza, pneumonia, and frequent colds. "Noise" includes humming, buzzing, ringing and roaring.

CHART VI

NAME	HEARING LOSS		TEST	BOYS	DISEASE	ACHE	NOISE
	%RIGHT	% LEFT	COND	COOP			
Adams, John	1.2	6.8	g	g	x	x	x
Aiston, Thomas	6.4	6.4	f	g	x	x	
Anderson, Clarence	11.6	6.4	p	f	x	x	x
Bell, Howard	3.2	7.2	f	f	x		
Bencheck, Robert	10.0	8.4	f	g			x
Benning, Robert	1.6	8.8	f	f			x
Betras, James	6.4	8.4	p	f			
Bridges, Vodra	8.4	9.2	f	f	x	x	
Brown, Mark	8.0	8.8	f	f	x		
Cassady, James	10.0	6.8	p	g	x	x	x
Chamberlain, Donald	2.4	6.4	f	g	x		x
Clark, Willie	8.4	8.0	p	f	x		
Coolsen, Raymond	6.4	8.4	f	f	x	x	
Cooney, Frank	6.8	3.6	p	f	x		x
Cooper, Thomas	10.8	14.4	f	f	x		
Coutts, David	7.6	7.2	f	g	x		
Davis, James	10.4	4.8	p	g	x		
DeShong, Earl	7.2	12.0	f	g	x	x	x
Douglas, Gordon	4.4	4.4	p	g	x		
Durham, William	3.6	4.0	f	g	x	x	
Dyke, Burnett	6.2	11.2	p	g	x		
Eaton, Charles	1.6	3.6	f	f	x		
Edman, Donald	10.0	13.2	f	f	x		x
Evans, Lyle	3.8	10.8	f	f	x		
Fritz, Elmer	10.4	10.0	p	f	x		x
Garcia, Emil	3.6	6.4	p	f	x		
Gardner, Arnold	2.8	3.6	f	g	x		
Gibson, Charles	12.0	5.2	p	g	x		
Gordon, LeRoy	10.8	9.6	p	g	x	x	x
Hall, Ronald	8.0	13.2	p	f	x	x	
Hardy, Francis	5.6	7.2	f	g	x		
Hargo, Maynard	10.8	14.0	p	g	x		
Harper, Irwin	8.0	20.0	f	f			
Harper, Leuriggle	4.8	3.6	p	g	x		x
Hitchcock, Keith	10.4	1.2	p	f	x	x	x
Hoeve, Joseph	19.2	11.2	p	g	x	x	
Hoornstra, David	6.4	9.6	f	f	x		x
Hoornstra, James	3.6	10.4	f	f	x		x
Horvath, Thomas	23.6	56.0	g	g	x		
Howell, Ronald	32.4	50.4	f	g	x	x	
Hunt, David	6.0	6.0	f	f	x	x	
Hytinen, Ronald	4.8	6.2	p	g			
Jacobus, Louis	22.4	38.0	f	g	x		
Jenkins, Clyde	20.4	22.0	p	g	x	x	
Jenkins, Eugene	8.0	11.6	f	f	x		
Johnson, Walter	9.2	3.6	p	g	x		x
Karin, Ronald	42.0	28.4	p	g	x	x	
Kennedy, Daniel	7.7	10.4	p	g	x		

CHART VI

NAME	HEARING LOSS		TEST	BOYS	DISEASE	ACHE	NOISE
	% RIGHT	% LEFT	COND	COOP			
Killips, Ronald	3.2	5.6	p	f	x		
King, Jessie	10.0	13.6	p	p	x		x
LaGrange, Robert	25.6	17.6	f	f	x	x	x
Lekenta, Eugene	10.0	7.6	f	f	x	x	
Lasco, Milton	10.0	9.2	p	g	x	x	x
Lasson, Arvil	32.8	25.2	f	p	x	x	
Lenart, Edward	4.4	11.6	f	f	x		
Lorig, Arthur	5.2	4.4	p	g	x		
Lutrov, Bruno	17.0	7.2	p	g			
McLaren, Bruce	14.8	12.0	p	g	x	x	
McLeod, Francis	6.8	10.0	p	f	x	x	x
Malone, James	5.6	4.4	f	g	x	x	
Martin, Peter	5.6	9.6	p	g	x		
Masters, Sidney	6.0	8.0	f	f	x	x	
Nablo, Raymond	6.4	9.6	f	g	x	x	
Oakly, Tracy	16.8	12.4	f	g	x	x	
Perry, James	7.6	5.6	f	p	x		
Phillips, Robert	8.0	11.2	f	g			
Prieur, August	10.0	7.6	p	f	x		x
Pritchard, Claude	15.2	10.0	p	f	x	x	x
Putman, Alva	8.4	6.4	f	f	x	x	
Reed, Robert	35.6	58.2	f	f	x	x	x
Rheaume, Ronald	7.2	6.4	p	f	x		x
Riederer, Frank	7.2	7.6	p	g	x		
Roberts, Maurice	8.4	10.8	f	f	x		
Russell, Max	6.8	10.8	f	g	x	x	
Sams, Leander	5.6	4.8	f	f	x		
Schuh, Harold	4.4	4.8	f	g	x	x	x
Seitz, William	3.6	14.0	f	g	x		x
Severin, Edward	6.8	8.8	f	g	x		x
Simon, Ellis	12.4	12.8	f	f			
Sinclair, Richard	10.8	12.0	f	f		x	x
Sterling, Edward	7.6	6.0	p	g	x	x	
Strauchman, Donald	4.4	4.0	p	f	x		x
Suarez, Frank	5.2	6.0	f	g			
Symons, James	1.2	2.4	p	f			x
Szczygiel, George	10.4	10.0	p	f			
Tharp, Paul	2.4	9.6	p	g	x		x
Theodorou, Robert	14.8	5.2	f	f	x	x	x
Thomas, Russell	8.0	6.0	p	g	x		x
Thompson, Joseph	4.0	7.2	p	g	x		
Vickery, Richard	70.0	63.6	g	g	x	x	
Walford, Rodger	8.4	4.4	f	g	x		
Walker, George	3.6	1.6	f	f			
Walton, Floyd	6.0	4.4	f	g	x		
War, James	9.2	6.4	p	f	x		
Wilson, Norman	5.6	6.8	f	f	x		
Winnie, Robert	22.8	32.8	p	g	x	x	x
Wyman, Harold	15.6	9.6	p	g	x	x	x

TABLE 1

Table 1 shows the number of boys tested and the number of speech defectives found. From these figures the percentage of boys at the School who have speech defects and the percentage without noticeable speech defects are computed.

The percentage of boys who are classified under specific speech defects is also computed. The total of the defective percentage greatly exceeds 100% due to the fact that many boys had more than one type of speech defect.

TABLE 1

Total number of boys tested	196	100.00%
Total number of boys with speech defects	153	78.06
Number of boys without speech defects	43	22.44

The following figures show the classifications of speech defects and the percentage of cases in each:

ARTICULATION	80.39%
SOUND DEVIATIONS	39.80
VOCAL-FUNCTIONAL	26.14
DIALECT	10.45
ORAL INACTIVITY	7.84
STUTTERING	1.96
VOCAL-STRUCTURAL	1.96
HARD-OF-HEARING-SPEECH	1.30

CHART VII

The following classifications and percentage figures are used to compare the frequency of occurrence of speech defects found among the boys at the Boys' Vocational School.

ARTICULATION	80.39%
SOUND DEVIATIONS	39.80
VOCAL-FUNCTIONAL	26.14
DIALECT	10.45
ORAL INACTIVITY	7.84
STUTTERING	1.96
VOCAL-STRUCTURAL	1.96
HARD-OF-HEARING-SPEECH	1.30

CHART VII

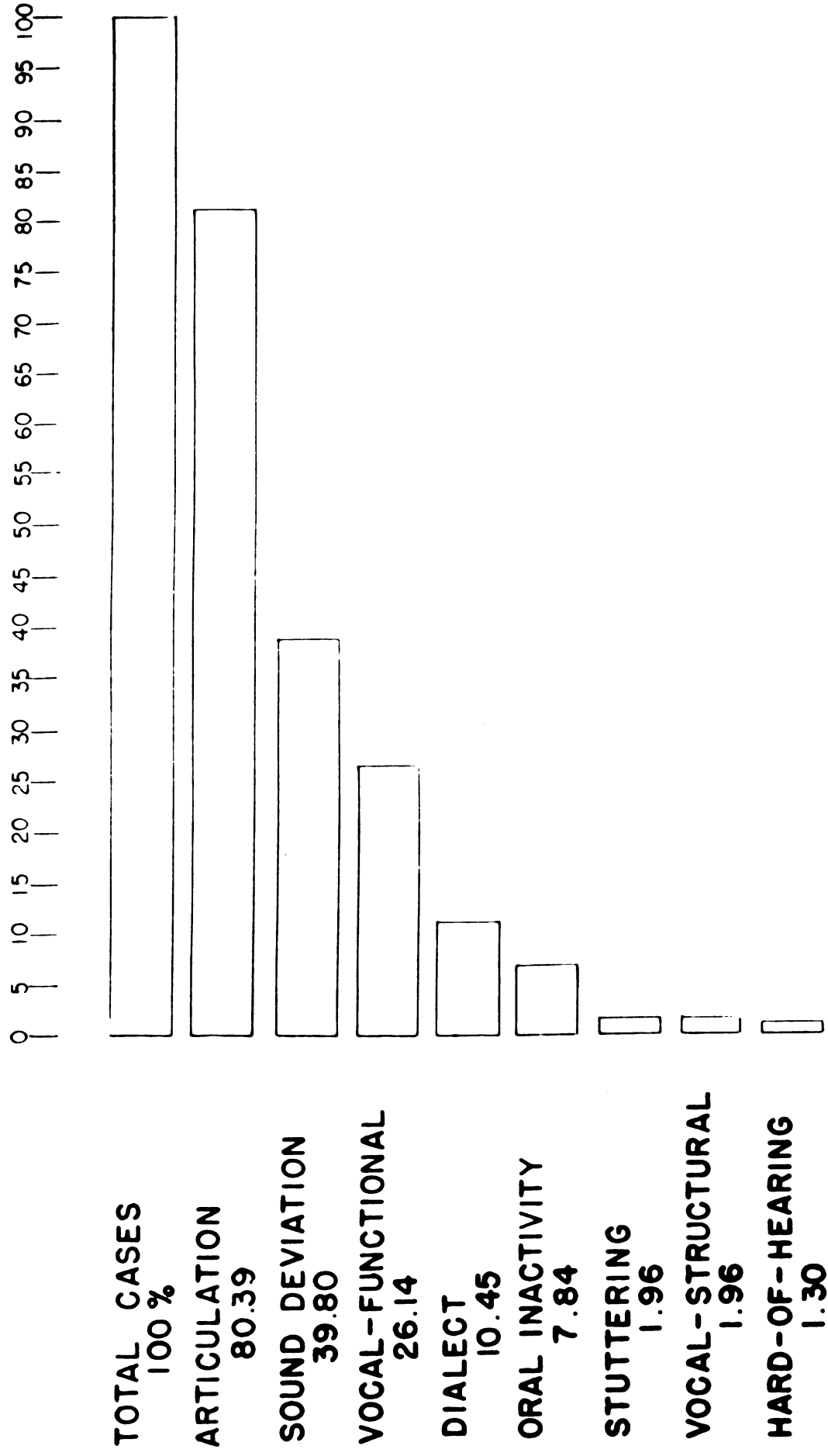


TABLE 11

Table 11 shows the comparison, by percentage figures, of the defective cases of speech under the classifications of Articulation, Sound Deviations, Vocal-Functional, Dialect, Oral Inactivity, Stuttering, Vocal-Structural, and Hard-of-Hearing-Speech as they appear in (1) "A Survey of Speech Defectives in the Public Schools of Ingham County, Michigan",³ which gives a local comparison, (2) a survey of Madison, Wisconsin, as reported in "The White House Conference Report",⁴ which is recognized as a typical school, and (3) this survey of the Boys' Vocational School in Lansing, Michigan.

The classifications without comparison indicate an unknown percentage of defectives.

3. Lane, Christopher C., Thesis for the Degree of M. A., Michigan State College, 1943.

4. White House Conference on Child Health and Protection, Section 111, "Education and Training", The Century Co., N. Y., 1931.

TABLE II

CLASSIFICATION	PERCENT OF CASES IN		
	INGHAM COUNTY	MADISON WISCONSIN	BOYS' VOCATIONAL SCHOOL
ARTICULATION	35.68	11.70	80.39
SOUND DEVIATION	17.90	10.14	39.80
VOICE-FUNCTIONAL	29.61	10.14	28.14
DIALECTS	.69	4.70	18.45
ORAL INACTIVITY		48.52	7.84
STUTTERING	9.61	10.29	1.96
VOCAL-STRUCTURAL		4.41	1.96
HARD-OF-HEARING		.14	1.30

CHART Vlll

Chart Vlll shows the comparison, in percentages, of the defective cases of speech under the classifications of Articulation, Sound Deviations, Vocal-Functional, Dialect, Oral Inactivity, Stuttering, Vocal-Structural, and Hard-of-Hearing-Speech as they appear in (1) "A Survey of Speech Defectives in the Public Schools of Ingham County, Michigan",⁵ which gives a local comparison, (2) a survey of Madison, Wisconsin, as reported in "The White House Conference Report",⁶ which is recognized as a typical school, and (3) this survey of the Boys' Vocational School in Lansing, Michigan.

The classifications without comparison indicate an unknown percentage of defectives.

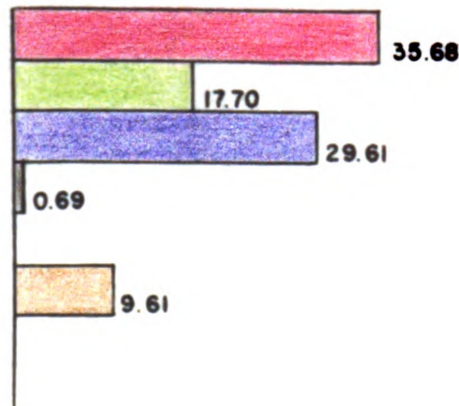
5. Lane, Christopher C., Thesis for the Degree of M. A., Michigan State College, 1943.

6. White House Conference on Child Health and Protection, Section lll, "Education and Training", The Century Co., N. Y., 1931.

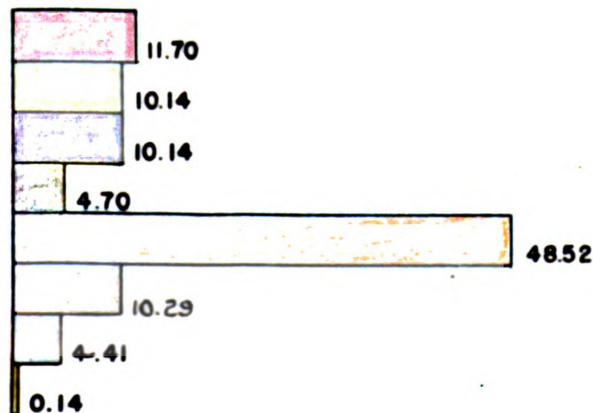
CHART VIII

0 10 20 30 40 50 60 70 80

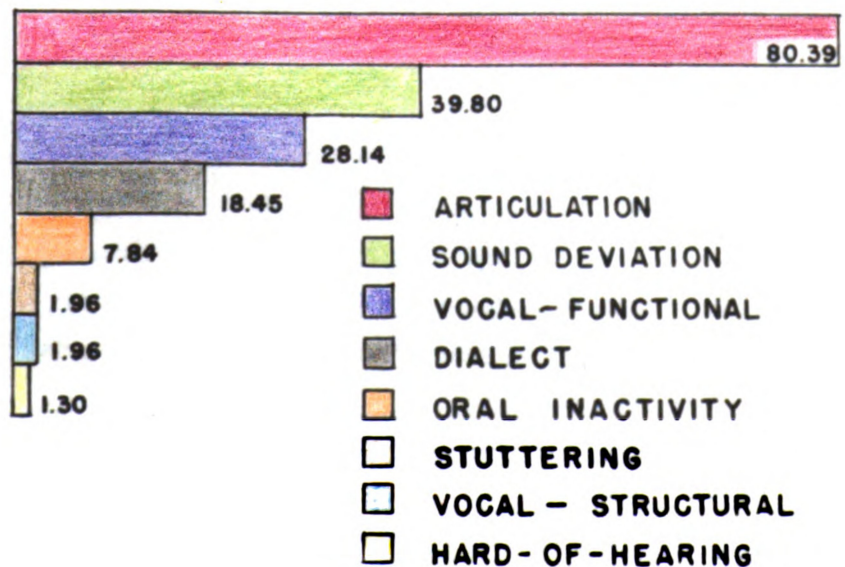
INGHAM
COUNTY



MADISON
WISCONSIN



BOYS'
VOCATIONAL
SCHOOL



- ARTICULATION
- SOUND DEVIATION
- VOCAL-FUNCTIONAL
- DIALECT
- ORAL INACTIVITY
- STUTTERING
- VOCAL - STRUCTURAL
- HARD-OF-HEARING

CHAPTER 111

CONCLUSION

The results of this survey show an extremely high and unexplainable percentage of defects both in hearing and speech.

In the White House Conference Report⁷ it was estimated conservatively that 14% of the school children have a hearing loss. In the Boys' Vocational School the percentage of boys who had a hearing loss was 41.85%.

The total percentage of speech defective boys at the Boys' Vocational School was 78.06%. This is a startling figure when compared to 21.4% in Fresno, California, which was the highest percentage found in a survey of 48 cities throughout the United States which had a population of 10,000 or more, and even more startling when compared to Philadelphia, Pennsylvania, which reported 1.0% on the same survey.⁸ The above comparison was made with the two extremes, but the median percentage of the same survey was only 6.9%.

Of the total cases of defective speech found at the Boys' Vocational School, 80.39% were classified as articulatory. This figure contrasts to 11.70% found in a typical school⁹ and to 35.68% found in Ingham County, Michigan.¹⁰

When the classification of articulation was broken down it was found that 92.24% of the cases so classified were found to have a

7. White House Conference on Child Health and Protection,
Section 111, "Education and Training", The
Century Co., N. Y., 1931.

8. Ibid

9. Ibid

10. Lane, Christopher C., Thesis for the Degree of M. A.,
Michigan State College, 1943.

defective "s". This might indicate the presence of infantile perseveration or other forms of emotional instability.

According to many authorities there is a direct relationship between speech and personality. West, Kennedy, and Carr say, "A speech disorder itself may become a reflexive factor in the personality development, serving as both cause and effect of a feeling of inferiority . . ." ¹¹ Van Riper points out, "We must realize that a speech defect is such an outstanding difference that it can beget its own personality problems and emotional conflicts. It is often difficult to determine whether the emotional conflict is the cause or the consequence of the speech defect." ¹² Berry and Eisenson state, "There seems to be a tendency for speech-defective individuals to present a personality picture which includes traits considered to be socially undesirable. We are not ready to say whether the relationship between the two factors is casual or merely concomitant." ¹³ And Eisenson again points out, "Mild disorders, trivial and transitory defects, should all be considered . . . They are so much with us that we accept them as a normal part of our lives. We become so immune to such mild disorders that we tend to overlook their importance. A disorder in the use of speech of any type or degree, reveals a disorder in personality." ¹⁴

11. West, R., Kennedy, L., and Carr, A., The Rehabilitation of Speech, Harper Brothers, New York, 1937, p. 44.

12. Van Riper, C., Speech Correction Principles and Methods, Prentice-Hall, Inc., 1945, p. 64.

13. Berry, M. F., and Eisenson, J., The defective in Speech, F. S. Crofts & Co., New York, 1945, p. 69.

14. Eisenson, Jon, The Psychology of Speech, F. S. Crofts & Co., New York, 1938, pp 156-157.

RECOMMENDATIONS

There has been no effort on the part of the author to use this survey to put forth the idea that speech and hearing defects are contributing factors to the pattern which makes up the constellation of behavior referred to as juvenile delinquency. However, the evidence contained herein shows that 78.06% of the boys in the Boys' Vocational School had a speech defect as contrasted to 6.9% which is the median percentage in a typical school.¹⁵ The hearing survey showed that 41.85% of the boys in the Boys' Vocational School indicated a hearing defect as contrasted to an average of 14% of school children throughout the United States.¹⁶ These figures indicate that it behooves both administrators and classroom teachers of the public schools to help the defective and handicapped children during their earlier formative years to make an adequate adjustment to their environment which will be in the accepted pattern of social behavior.

It is recommended that the public school teacher be encouraged to enroll in subjects dealing with the psychology of the defective and handicapped child, and various branches of special education during their preparatory training or/ and to elect to enroll in such subjects while working off refresher credits as required by the Department of Public Instruction in Michigan.

15. White House Conference on Child Health and Protection,
Section III, "Education and Training", The
Century Co., N. Y., 1931.

16. Ibid

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BIOGRAPHY

William Kennedy Lee was born at St. Joseph, Michigan on July 17, 1918. He was graduated from Michigan State College in 1940, where he did his speech correction work under Dr. Clarence Raymond Van Dussen. During 1940 he assisted in the Ingham County speech clinic which was conducted from Michigan State College. Early in 1941, he entered the army where he served in the Medical Department for five years, both in the United States and in the European Theater of Operations. Upon his release from the army, he again entered Michigan State College where he did his graduate work under the direction of Mrs. Lucia Morgan Nesom. Mr. Lee was employed in 1946 as speech correctionist in the public schools of Bay City, Michigan

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