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ABSTRACT

Relationships between 15 family, psychological and demographic variables and reading and math achievement are reported for more than 500 hearing impaired children (8 to 15 years old) in a residential state school. The data are also examined for subgroups of children (i.e., hereditary and nonhereditary deafness, rubella, nonrubella, and those with severe and profound hearing losses). For the total group, reading achievement is most highly predicted by IQ, the frequency of family letters, and the number of years the children are at school. The 15 variables collectively account for 30% of the variance associated with reading. Math achievement is most highly predicted by IQ, size of weekly allowance, student-parent communication of feelings, and the number of their handicaps. The 15 variables collectively account for 38% of the variance associated with math. Four of the 15 variables (i.e., Wechsler Intelligence Scale for Children-Revised and Leiter IQs, size of weekly allowance, and number of years at the school) are fairly consistent predictors of achievement across the subgroups. The remaining 11 variables contribute relatively little to the prediction of reading or math achievement. (Author/CL)

Variables Associated with the Educational Development of Residential Deaf Children

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Variables Associated with the Educational Development of

Residential Deaf Children

Summary:

Relationships between 15 family, psychological and demographic variables and reading and math achievement are reported for more than 500 hearing impaired children residing at a residential state school. The data also are examined for subgroups of children ,i.e., hereditary and nonhereditary deafness, Rubella, nonrubella, and those with severe and profound hearing losses.

For the total group, reading achievement is most highly predicted by IQ, the frequency of family letters, and the number of years the children are at the school. The 15 variables collectively account for 30 percent of the variance associated with reading. Math achievement is most highly predicted by IQ, size of weekly allowance, student-parent communication of feelings, and the number of their handicaps. The 15 variables collectively account for 38 percent of the variance associated with math.

Four of the 15 variables (i.e., WISC-R and Leiter IQs, size of weekly allowance, and the number of years at the school) are fairly consistent predictors of achievement across the subgroups. The remaining 11 variables contribute relatively little to the predication of reading or math achievement.

Variables Associated with the Educational Development of

Residential Deaf Children

The work of educators and psychologists responsible for providing services to hearing impaired children may be helped by knowing the characteristics associated with their psychoeducational development.

This information may allow us to better describe and explain their development, to make more accurate placement decisions, and to help guide their development.

Prior research on this topic has identified a number of cognitive, demographic, and social variables which correlate with the educational achievement of hearing impaired children. Relationships between 21 cognitive variables and grade point averages (GPA) were determined for 1047 post secondary deaf students (Long and Coggiola, 1980; White, 1979). Five cognitive variables were most salient. Scores from the California Achievement Test reading comprehension, the National Technical Institute for the Deaf (NTID) Mathematic Diagnostic Test System, the NTID Test of Written Language, and the Differential Aptitude Test: Abstract Reasoning and Spatial Relations measures provided the most non-redundant predictors of GPA.

Relationships between demographic and nonverbal variables and reading achievement as measured by the Stanford Achievement Tests were determined for 93 normal deaf children ages eight to 14 (Serwatha, 1976). Four variables were significant, contributing 41 percent of the variance: mental age, speech discrimination, flexibility scores from the Torrance Test of Creativity (nonverbal form), and hearing loss. Twelve variables were not significant: gender,

chronological age, age at initial amplification, age at initial training, parental attitudes toward deafness, family's socioeconomic level, and surprisingly the WISC-R Performance subtests and IQ.

Another recent study (Savage, Evans, and Savage, 1981) using English deaf children between ages eight to 13 found that the WISC-R Performance IQ was most strongly associated with reading comprehension as measured by the Group Reading Test devised by Young (1968).

Studies have utilized longitudinal (Lane, 1946; Fiedler, 1969), cross-sectional (Brill, 1962; Birch and Birch, 1965; Giangreco, 1966; Montgomery, 1966), descriptive (Ries, 1973; Jensema, 1975; Jensema and Trybus, 1978), and other (Johnson, 1947; Goetzinger and Rousey, 1959; Donnelly, 1964; Monsees, 1971; Pressnell, 1973; Vandenberg, 1973; Anderson, 1974 and Laughton, 1976) methodological techniques on different samples.

These studies serve to identify variables related and unrelated to the academic development of hearing impaired children. Further studies of this nature are needed, particularly with large sample sizes, in order to examine the consistency and strength of the results with children from different regions, cultures, and institutional settings.

The present study was undertaken at a state residential school for the deaf in order to provide further information as to the influences selected social, psychological, and demographic factors have on the reading and math achievement of hearing impaired children.

Method

This study examines relationships various social, psychological, and demographic characteristics have with achievement for more than 500 children

(ages eight to 15) as well as for subgroups comprised of deafness due to heredity, nonheredity, Rubella, nonrubella, and those with severe and profound hearing losses. The children reside at a state residential institution for hearing impaired children. They are in continuous attendance for nine months each year except for holiday and occasional weekend visits to their homes. The children average seven and one-half years in residence at the institution. Approximately 60 percent of the sample is male. Most children come from lower middle and lower class homes.

The children's hearing impairment tends to occur at about three months. Children in the Rubella category are congenitally deaf while those in the other categories often acquired deafness by 18 to 24 months. The children generally have one physical or mental handicap in addition to their auditory impairment.

Information on the nine items included as family support variables was obtained from the dorm parents. They are the students' surrogate parents while attending the school, have daily contact with the children, have the most frequent contact with the parents, and observe student-parent interactions.

Information on students' IQs, achievement, and demographic characteristics was obtained from the school's files. Achievement was assessed by the Stanford Achievement Test: Hearing Impaired Version and reported in scale scores.

Children were placed into various subgroups (e.g., hereditary or nonhereditary deafness, deafness due or not due to Rubella) also on the basis of information in their files. Children were labeled as severely impaired with 71-90 dB losses and profoundly impaired with $\geq$ 91 dB losses.

Put TABLE 1 about here

Fifteen variables comprise the data used to predict achievement in reading and math (see Table 1 for their means and standard deviations).

The 15 variables were ordered for use in multiple regression equations on the basis of their presumed modifiability. That is, the first nine variables characterize family support variables which presumably are alterable. For example, the amount of money a student has to spend each week and their ability to communicate feelings and information are three characteristics which can be modified. Moreover, these characteristics are more subject to modification than the age at onset of their hearing impairment or their degree of loss. The effects these nine family support variables have on achievement are determined first. Following them come the IQ data; they are less modifiable. The final four variables describe demographic characteristics which may be the most difficult to alter. This ordering hopefully allows educators and psychologists to identify factors which both affect achievement and may be improved as well as allowing administrators and research personnel to determine the full impact of all variables on achievement.

Three statistics are used to report the data. First, the simple r, a Pearson Product-Moment correlation reflects relationships between achievement and each variable. The second statistic, the multiple R, is the correlation between achievement and the combination of that variable plus all previous variables. For example, the combined effects of variables one through nine correlated .38 with reading achievement. The third statistic, the multiple square R (or R^2), is derived by squaring the multiple R. The R^2 reflects the proportion of variance in achievement accounted for by the combined effect of

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Put TABLE 2 about here

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that variable plus all prior variables. Except as otherwise indicated, all results are statistically significant at the .05 level of confidence or greater.

Results and Discussion

Reading Achievement

Total Group. The following variables most directly correlate with achievement reading: WISC-R and Leiter IQs, frequency of family's letters, and the number of years attending the school. Higher reading scores tend to be associated with higher values on these four variables (Table 2). The family support variables account for 14 percent of the variance associated with reading, and the IQs add another seven percent. The combined 15 variables account for 30 percent of the variance associated with reading.

Deafness Due to Heredity. Reading and math achievement data on these children could not be analyzed through multiple regression because there are too few children in this group.

Children with Nonhereditary Deafness. A number of factors correlate strongly with their reading achievement: the WISC-R and Leiter IQs, the size of weekly allowance, the number of years attending the school, and the effectiveness of student-parent communication of information. Information on family support variables accounts for 15 percent, the IQs an additional seven percent, and the remaining demographic variables seven percent of the variance associated with reading.

Children with Rubella. For children in this subgroup, the size and regularity of weekly allowance, the number of years attending the school, their IQ, and the effectiveness of parent-student communication of information all correlate positively with reading. The family support data account for 29

percent, the IQ an additional six percent and the remaining demographic variables five percent of the variance associated with reading.

Nonrubella Children. Many of the same variables again correlate with reading achievement: IQ, size of allowance, years attending the school, and student-parent communication of both feelings and information. However, compared to the data from the Rubella children, the family support data on the nonrubella children have an overall lower correlation with achievement, accounting for only 14 percent of the variance associated with reading achievement. IQ, on the other hand, accounts for an additional 14 percent while the demographic variables account for an additional five percent.

Children with Severe Hearing Loss. All variables but three (students' comments toward family, regularity of allowance, and number of multiple handicaps) correlate significantly with reading achievement. The family support data account for 38 percent of the reading variance, IQ adds an additional five percent, and the demographic variables contribute an additional nine percent.

Children with a Profound Hearing Loss. IQ and number of years attending the school correlate significantly along with only one family support variable: size of weekly allowance. The combined family support information accounts for 13 percent of the reading variance, IQ also accounts for an additional 13 percent, and the remaining variables account for an additional four percent.

Put TABLE 3 about here

Math Achievement

Total Group. IQ and size of weekly allowance correlate highest (Table 3) with math achievement while student-parent communication of feelings and the number of handicaps also correlate highly. The combined family support data

accounts for 18 percent of the variance associated with math, an additional 14 percent by IQ, and the additional six percent by the remaining four demographic characteristics.

Children with Nonhereditary Deafness. For these children IQ and size of weekly allowance are most highly correlated with math achievement; an additional six characteristics correlate moderately (i.e., r in the 20s) with math. The r family support data account for 19 percent of the math variance, IQ an additional 14 percent, and the remaining characteristics an additional seven percent.

Children with Rubella. IQ, number of years attending the school, size and regularity of weekly allowance and number of handicaps correlate highest with math achievement. The combined family support data account for 16 percent of the math variance, IQ an additional 15 percent, and the four demographic characteristics seven percent.

Nonrubella Children. IQ and size of the weekly allowance correlate highest with math achievement; seven other characteristics also correlate moderately. The combined family support data account for 23 percent of the math variance, IQ adds an additional 16 percent, and the last four characteristics contribute an additional five percent.

Children with a Severe Hearing Loss. IQ correlates highest with math achievement. Seven other characteristics also correlate highly ($r \geq .30$): frequency of letters, student-parent communication of feelings and information, size of allowance, family reaction to emergencies, number of handicaps, and number of years attending the school. The combined family support data account for 36 percent of the math variance, IQ adds an additional 10 percent, and the remaining four demographic characteristics provide an additional four percent.

Children with a Profound Hearing Loss. IQ and size of allowance correlate highest with math achievement. Student-parent communication of feelings, number of handicaps, and number of years attending the school correlate moderately. The combined family support data account for 18 percent of the math achievement variance, IQ an additional 15 percent, with the other four characteristics accounting for an additional five percent.

Put TABLE 4 about here

Conclusions

Among the 15 variables included in this study, a few clearly and consistently correlate with both reading and math achievement (Table 4). The Performance WISC-R IQ is the highest and most consistent variable. This was also true in the Savage (1981) study. The WISC-R was the most significant variable related to both reading and math achievement in eight of the 10 subgroups and with the total group. The size of a student's allowance also correlates highly and consistently. It generally correlates the second or third highest with achievement. This variable may reflect the socioeconomic status of the student's family, a variable which often corresponds to achievement within a deaf population (Trybus, 1975) and a hearing population (Lavin, 1965). Other variables which significantly and somewhat consistently correlate with achievement include the Leiter IQ and the number of years the students attended the school. Two additional variables, student-parent communication of feelings and number of nonauditory handicaps, also occasionally correlate with math but not reading. In general, the variables associated with reading tend also to be associated with math.

A slightly different pattern emerges for the severely impaired children. For them many variables correlate with achievement while with the other subgroups, fewer number of variables correlate with achievement.

The majority of the variables (eight of the 15) generally are unrelated statistically with both reading and math achievement. The use of three or four variable characteristics can predict achievement as accurately as can the use of all 15.

Finally, one should recognize that these variables are important and account for a significant part of variance associated with achievement. However, they do not comprise all the characteristics important to children's academic development. While they account for a large percentage of variance associated with both reading (30 percent) and math (39 percent) for the total group, even larger percentages remain unaccounted for: 70 percent for reading and 61 percent for math. Thus, while these data assist us in identifying some characteristics important to children's academic development, further research is needed in order to identify other important characteristics associated with reading and math achievement.

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Table 1

Ns, Means, and Standard Deviations for Study Variables

for Hearing Impaired Children

	Total Group			Hereditary Deafness			Nonhereditary Deafness			Rubella			Nonrubella			Severe			Profound		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Family Support Variables																					
Amount of weekly allowance	361	2.0	.7	37	1.8	.7	324	2.0	.7	91	1.8	.7	270	2.0	.7	67	2.0	.7	278	2.0	.7
Student-parent communication of feelings	338	3.2	1.1	36	3.7	1.0	302	3.2	1.1	85	3.1	1.0	253	3.3	1.1	64	3.1	1.0	258	3.2	1.1
Student-parent communication of information	361	2.6	1.6	37	3.6	1.7	324	2.5	1.6	93	2.3	1.5	268	2.7	1.7	69	2.4	1.7	276	2.6	1.6
Frequency of letters from family or friends	360	3.4	1.8	38	3.4	1.7	322	3.4	1.8	91	3.3	1.9	269	3.5	1.8	68	3.1	1.9	276	3.5	1.8
Parental reaction to emergencies	304	2.8	.5	31	2.6	.6	273	2.8	.5	79	2.8	.5	225	2.8	.5	60	2.7	.6	229	2.8	.5
Family's demonstrated concern about the student	359	3.3	1.2	37	3.6	1.0	322	3.3	1.2	90	3.3	1.1	269	3.4	1.2	68	3.2	1.3	275	3.3	1.2
Students' comments toward their families	339	2.6	.6	36	2.7	.5	303	2.6	.6	89	2.5	.6	250	2.6	.6	65	2.7	.6	259	2.6	.6
Students' feelings about trips home	365	2.7	.6	38	2.7	.6	327	2.7	.7	93	2.8	.6	272	2.6	.7	69	2.7	.6	280	2.7	.7
Regularity of allowance	363	1.8	.4	37	1.8	.4	326	1.8	.4	92	1.8	.4	271	1.8	.4	68	1.8	.4	279	1.8	.4
IQ																					
Leiter International Test	262	94	19	26	110	20	236	92	19	86	92	15	176	95	21	45	87	17	210	95	20
Wechsler Intelligence Scale for Children-Revised: Performance IQ	530	94	16	60	101	15	470	94	16	134	94	15	396	95	17	95	92	16	416	95	16
Demographic Variables																					
Student's age at onset of hearing impairment	644	.3	1.0	84	.2	1.5	560	.4	.9	163	0	0	481	.5	1.1	110	.4	1.6	511	.3	.8
Number of nonauditory handicaps	689	1.1	.4	84	1.1	.2	605	1.2	.4	163	1.2	.5	526	1.1	.4	116	1.2	.5	545	1.1	.4
Degree of hearing loss	684	94	14	84	96	11.9	600	94	14.3	163	92.9	14	521	94	14	116	76	8.0	545	99	7.9
Number of years at the school	657	7.6	4.0	84	7.5	4.1	573	7.6	4.0	163	7.2	3.8	494	7.8	4.1	113	7.2	3.6	520	7.7	4.0
Achievement																					
Reading	496	132	22	64	142	24.2	432	131	21	114	132.3	26	382	132	20	87	132	23	391	132	22
Math	495	156	32	64	169	34.7	431	154	31	115	154.3	36	380	156	30	86	155	33	391	156	32

Table 2

Simple Correlations, Multiple Correlations and Multiple R^2

For 15 Variables and Reading Achievement for Hearing Disabled Children

Variable	r	Multiple R	Multiple R^2
Total Group[1]			
Family Support Variables			
Amount of weekly allowance	.29	.29	.09
Student-parent communication of feelings	.19	.33	.11
Student-parent communication of information	.23	.35	.12
Frequency of letters from family or friends	.13	.35	.12
Parental reaction to emergencies	.14	.36	.13
Family's demonstrated concern about the student	.17	.37	.14
Students' comments toward their families	.10	.37	.14
Students' feelings about trips home	.13	.38	.14
Regularity of allowance	.12	.38	.14
IQ			
Leiter International Test	.29	.46	.21
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.41	.49	.24
Demographic Variables			
Student's age at onset of hearing impairment	.00	.49	.24
Number of nonauditory handicaps	-.20	.49	.24
Degree of hearing loss	-.07	.51	.26
Number of years at the school	.25	.55	.30
Children with Nonhereditary Deafness[1]			
Family Support Variables			
Amount of weekly allowance	.32	.32	.10
Student-parent communication of feelings	.17	.35	.12
Student-parent communication of information	.21	.36	.13
Frequency of letters from family or friends	.13	.36	.13
Parental reaction to emergencies	.14	.37	.13
Family's demonstrated concern about the student	.12	.38	.14
Students' comments toward their families	.09	.38	.14
Students' feelings about trips home	.11	.38	.15
Regularity of allowance	.11	.38	.15
IQ			
Leiter International Test	.24	.44	.19
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.38	.47	.22
Demographic Variables			
Student's age at onset of hearing impairment	.03	.47	.22
Number of nonauditory handicaps	-.21	.47	.22
Degree of hearing loss	-.08	.49	.24
Number of years at the school	.29	.54	.29

Table 2

(continued)

Variable	r	Multiple R	Multiple R^2
Children with Rubella[1]			
Family Support Variables			
Amount of weekly allowance	.42	.42	.18
Student-parent communication of feelings	-.01	.43	.18
Student-parent communication of information	.24	.49	.24
Frequency of letters from family or friends	.08	.49	.24
Parental reaction to emergencies	.18	.50	.25
Family's demonstrated concern about the student	.08	.50	.25
Students' comments toward their families	-.01	.50	.25
Students' feelings about trips home	.02	.50	.25
Regularity of allowance	.24	.54	.29
IQ			
Leiter International Test	.16	.55	.31
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.30	.59	.35
Demographic Variables			
Student's age at onset of hearing impairment	-.15	.61	.37
Number of nonauditory handicaps	-.16	.62	.39
Degree of hearing loss	.43	.65	.42
Number of years at the school			
Nonrubella Children[1]			
Family Support Variables			
Amount of weekly allowance	.26	.26	.07
Student-parent communication of feelings	.23	.33	.11
Student-parent communication of information	.22	.34	.11
Frequency of letters from family or friends	.15	.34	.11
Parental reaction to emergencies	.13	.34	.12
Family's demonstrated concern about the student	.14	.36	.13
Students' comments toward their families	.13	.36	.13
Students' feelings about trips home	.16	.37	.14
Regularity of allowance	.11	.37	.14
IQ			
Leiter International Test	.39	.53	.28
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.46	.54	.29
Demographic Variables			
Student's age at onset of hearing impairment	.00	.54	.29
Number of nonauditory handicaps	-.23	.54	.29
Degree of hearing loss	.00	.55	.31
Number of years at the school	.20	.58	.34

Table 2

(continued)

Variable	r	Multiple R	Multiple R^2
Children with a Severe Hearing Loss[2]			
Family Support Variables			
Amount of weekly allowance	.40	.40	.16
Student-parent communication of feelings	.32	.45	.20
Student-parent communication of information	.38	.49	.24
Frequency of letters from family or friends	.36	.52	.27
Parental reaction to emergencies	.39	.59	.35
Family's demonstrated concern about the student	.27	.59	.35
Students' comments toward their families	.19	.60	.36
Students' feelings about trips home	.27	.62	.38
Regularity of allowance	.09	.66	.43
IQ			
Leiter International Test	.26	.66	.43
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.37	.66	.44
Demographic Variables			
Student's age at onset of hearing impairment	-.08	.66	.44
Number of nonauditory handicaps	-.32	.68	.46
Degree of hearing loss			
Number of years at the school	.27	.72	.52
Children with a Profound Hearing Loss[1]			
Family Support Variables			
Amount of weekly allowance	.29	.29	.08
Student-parent communication of feelings	.16	.32	.10
Student-parent communication of information	.18	.33	.11
Frequency of letters from family or friends	.08	.33	.11
Parental reaction to emergencies	.08	.33	.11
Family's demonstrated concern about the student	.09	.35	.12
Students' comments toward their families	.09	.35	.12
Students' feelings about trips home	.09	.35	.12
Regularity of allowance	.13	.36	.13
IQ			
Leiter International Test	.30	.46	.21
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.43	.51	.26
Demographic Variables			
Student's age at onset of hearing impairment	.02	.51	.26
Number of nonauditory handicaps	-.16	.51	.26
Degree of hearing loss			
Number of years at the school	.25	.55	.30

1. Simple correlations $\geq .16$ are statistically significant $\leq .05$.
2. Simple correlations $\geq .24$ are statistically significant $\leq .05$.

Table 3

Simple Correlations, Multiple Correlations and R^2 for 15 Variables and Math Achievement for Hearing Disabled Children

Variable	r	Multiple R	Multiple R^2
Total Group[1]			
Family Support Variables			
Amount of weekly allowance	.34	.33	.11
Student-parent communication of feelings	.25	.39	.15
Student-parent communication of information	.18	.39	.16
Frequency of letters from family or friends	.20	.40	.16
Parental reaction to emergencies	.17	.41	.17
Family's demonstrated concern about the student	.17	.42	.18
Students' comments toward their families	.17	.42	.18
Students' feelings about trips home	.12	.42	.18
Regularity of allowance	.12	.42	.18
IQ			
Leiter International Test	.29	.50	.25
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.50	.57	.33
Demographic Variables			
Student's age at onset of hearing impairment	-.01	.57	.33
Number of nonauditory handicaps	-.25	.58	.33
Degree of hearing loss	-.01	.58	.34
Number of years at the school	.25	.62	.39
Children with Nonhereditary Deafness[1]			
Family Support Variables			
Amount of weekly allowance	.36	.36	.13
Student-parent communication of feelings	.22	.40	.16
Student-parent communication of information	.21	.40	.16
Frequency of letters from family or friends	.21	.41	.17
Parental reaction to emergencies	.16	.42	.18
Family's demonstrated concern about the student	.16	.44	.19
Students' comments toward their families	.14	.44	.19
Students' feelings about trips home	.11	.44	.19
Regularity of allowance	.11	.44	.19
IQ			
Leiter International Test	.29	.50	.25
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.50	.57	.33
Demographic Variables			
Student's age at onset of hearing impairment	.02	.57	.33
Number of nonauditory handicaps	-.27	.58	.33
Degree of hearing loss	-.04	.59	.34
Number of years at the school	.29	.63	.40

Table 3

(continued)

Variable	r	Multiple R	Multiple R^2
Children with Rubella[1]			
Family Support Variables			
Amount of weekly allowance	.31	.31	.09
Student-parent communication of feelings	-.01	.31	.10
Student-parent communication of information	.08	.31	.10
Frequency of letters from family or friends	.15	.34	.12
Parental reaction to emergencies	.07	.34	.12
Family's demonstrated concern about the student	.10	.35	.12
Students' comments toward their families	-.01	.35	.12
Students' feelings about trips home	.00	.35	.12
Regularity of allowance	.26	.40	.16
IQ			
Leiter International Test	.22	.45	.20
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.42	.56	.31
Demographic Variables			
Student's age at onset of hearing impairment	-.23	.56	.31
Number of nonauditory handicaps	-.10	.57	.33
Degree of hearing loss	.36	.61	.38
Number of years at the school			
Nonrubella Children[1]			
Family Support Variables			
Amount of weekly allowance	.34	.34	.11
Student-parent communication of feelings	.32	.44	.19
Student-parent communication of information	.20	.44	.19
Frequency of letters from family or friends	.21	.44	.19
Parental reaction to emergencies	.20	.45	.20
Family's demonstrated concern about the student	.19	.47	.22
Students' comments toward their families	.20	.47	.22
Students' feelings about trips home	.17	.47	.22
Regularity of allowance	.10	.48	.23
IQ			
Leiter International Test	.33	.56	.32
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.53	.62	.39
Demographic Variables			
Student's age at onset of hearing impairment	-.02	.62	.39
Number of nonauditory handicaps	-.26	.62	.39
Degree of hearing loss	.03	.62	.39
Number of years at the school	.22	.66	.44

Table 3

(continued)

Variable	r	Multiple R	Multiple R^2
Children with a Severe Hearing Loss[2]			
Family Support Variables			
Amount of weekly allowance	.31	.31	.10
Student-parent communication of feelings	.31	.39	.15
Student-parent communication of information	.21	.39	.15
Frequency of letters from family or friends	.37	.44	.19
Parental reaction to emergencies	.33	.49	.24
Family's demonstrated concern about the student	.20	.50	.25
Students' comments toward their families	.15	.52	.27
Students' feelings about trips home	.21	.54	.29
Regularity of allowance	.01	.60	.36
IQ			
Leiter International Test	.38	.61	.38
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.55	.68	.46
Demographic Variables			
Student's age at onset of hearing impairment	-.04	.68	.46
Number of nonauditory handicaps	-.31	.68	.46
Degree of hearing loss			
Number of years at the school	.30	.71	.50
Children with a Profound Hearing Loss[1]			
Family Support Variables			
Amount of weekly allowance	.35	.35	.12
Student-parent communication of feelings	.25	.41	.17
Student-parent communication of information	.16	.41	.17
Frequency of letters from family or friends	.17	.41	.17
Parental reaction to emergencies	.11	.41	.17
Family's demonstrated concern about the student	.16	.43	.18
Students' comments toward their families	.17	.43	.18
Students' feelings about trips home	.10	.43	.18
Regularity of allowance	.14	.43	.18
IQ			
Leiter International Test	.28	.51	.26
Wechsler Intelligence Scale for Children-Revised: Performance IQ	.49	.58	.33
Demographic Variables			
Student's age at onset of hearing impairment	.01	.58	.33
Number of nonauditory handicaps	-.23	.58	.34
Degree of hearing loss			
Number of years at the school	.24	.62	.38

1. Simple correlations $\geq .16$ are statistically significant $\geq .05$.
2. Simple correlations $\geq .24$ are statistically significant $\geq .05$.

Table 4

Rank Order of Correlations ≥ .25 Associated with Reading and Math Achievement

	Reading						Math					
	Total	NH	Rub	NRub	Sev	Prof	Total	NH	Rub	NRub	Sev	Prof
Family Support Variables												
Amount of weekly allowance	2.5	2	3	3	1	3	2	2	3	2	6	2
Student-parent communication of feelings					6.5		5			4	6	4
Student-parent communication of information					3							
Frequency of letters from family or friends					5						3	
Parental reaction to emergencies					2						4	
Family's demonstrated concern about the student					9							
Students' comments toward their families												
Students' feelings about trips home					9							
Regularity of allowance									4			
IQ												
Leiter International Test	2.5			2	11	2	3	3.5		3	2	3
Wechsler Intelligence Scale for Children-Revised: Performance IQ	1	1	4	1	4	1	1	1	1	1	1	1
Demographie Variables												
Student's age at onset of hearing impairment												
Number of nonauditory handicaps							5	5		5	6	
Degree of hearing loss			1.5		6.5						8	
Number of years at the school	4	3	1.5		9	4	5	3.5	2			

NH = nonhereditary deafness, Rub = Rubella, NRub = nonrubella, Sev = Severe, Prof = Profound