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Running head: AN ANALYSIS OF STANDARDIZED TESTING AND DEAFNESS

Deaf students' reading and language scores on standardized tests at entry to college  
related to their degree completion

Master's Project

Submitted to the Faculty  
Of the Master of Science Program in Secondary Education  
Of Students who are Deaf or Hard of Hearing

National Technical Institute for the Deaf  
Rochester Institute of Technology  
Rochester, New York  
23 May 2002

By

Jess La Sala

In Partial Fulfillment of the Requirements  
For the Degree of Master of Science in Secondary Education

Approved:

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(Project Advisor) (Date)

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(Second Project Advisor) (Date)

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(Program Director) (Date)

### Abstract

This study examined the relationship of deaf students' performance on standardized entrance exams and their academic successes at both the National Technical Institute for the Deaf and at Rochester Institute of Technology. For the purpose of this study, academic success was defined as completion of degree program. The results showed that higher reading levels at entry to college were associated with successful degree completion at the AAS and BS degree levels and students who graduated with these degrees had significantly higher reading levels compared to students who did not complete a degree. Eighty four percent of the students with a 12<sup>th</sup> grade reading range earned a BS or a BFA degree. Seventy percent of the students who scored a 10<sup>th</sup> or 11<sup>th</sup> grade reading range earned a BS or a BFA degree. Forty-two percent of the students with a 7.5 grade reading range or below earned a BS or a BFA degree.

## Introduction

Standardized testing is commonplace in the at all levels of education in the U.S.A. Some popular examples are the Stanford Achievement Test, the American College Test, and the Scholastic Assessment Test. However, there is a continuing controversy regarding the use of standardized tests to measure students' educational achievement or aptitude, especially with a diverse student population (Fowler, 2001, LaSasso, 1999, Maller & Ferron, 1997, Popham, 2001, and Sacks, 1997). How can one create a fair standardized test that all students can benefit from, and show their true intellectual abilities and aptitudes?

Teachers in classrooms try their best to make students' educational experience rich and relevant. They try to include all different kinds of information from every corner of the world. This involves a lot of preparation on the teacher's part. Ask a teacher anytime, "What is your ideal classroom?" Teachers will respond with great vigor, and none of their fantasies include standardized tests (Zurek, personal communication, 2000). Why does this happen? "Teachers worry that to prepare our students for the tests, which students must pass to earn Oregon's 10<sup>th</sup> grade Certificate of Initial Mastery, we will have to turn our classrooms into vast wading pools of information for students to memorize" (Bigelow, 1999). Teachers also do not know what will be on these standardized tests so they conduct a classroom that could qualify for the Olympics in the memory event (Bigelow).

Standardized tests are pedagogically controversial. There are many factors as to why standardized tests may be detrimental for students who are minorities. These factors



include but aren't limited to discrimination, language barriers, and/ or school curricula. School curricula in America vary greatly. Will standardized tests support what is taught in our schools? Some argue that standardized tests are good tools for predicting success for our students. How do standardized tests affect deaf students in America?

### Literature Review

In 1956, Benjamin Bloom led educational psychologists in developing a model of cognitive thinking. The levels are as follows (in increasing difficulty): Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation (Christopher, 1998). Knowledge as defined by Bloom is "a starting point that includes both the acquisition of information and the ability to recall information when needed." The 3<sup>rd</sup> level of Bloom's taxonomy is Application, and it is defined as "the ability to use a learned skill in a new situation" (p. 1). What is most important in assessing students' educational abilities is *how* the students apply their knowledge. Standardized testing does not assess the higher cognitive abilities of the students. According to Bigelow (1999), standardized test questions focus on facts but do not address the deeper, multifaceted meaning of facts. Sacks (1997) provided evidence that traditional tests reinforce passive, rote learning of facts and formulas, which is the total opposite of the critical thinking skills many educators and employers now believe schools should be encouraging.

Standardized tests do discriminate. Sacks (1997) calls this phenomenon the "Volvo Effect." He states that the data show a person can guess about a child's standardized test scores by looking at his/her parents' highest educational degree, kind of

vehicle they drive, and the color of their skin. The unconscious damage inflicted on minority students must be monumental. The gatekeepers to opportunity and academia may very well possibly look at the students and assume their scores and put less effort in guiding them through life. Therefore the students continue to fall further back and back and when it is time for them to take standardized tests, they will not do well. Who is to blame? The fact that standardized tests exist provides educators the opportunity to control the fate of their students.

Literature on standardized tests is more negative than positive. The positive aspects of standardized testing are difficult to find. It is amazing that President Bush is pushing for more standardized testing across states regardless of the negative literature (Fowler, 2001). This will affect the population of deaf students greatly for a number of reasons. First, it is widely known that deaf students' level of reading is consistently lower than that of their hearing peers (LaSasso, 1999). Second, discrimination often occurs to deaf people. Gatekeepers may see deafness as a handicap both educationally and physically and use that as a reason for deaf and hard of hearing (HOH) people for not putting in their best efforts, thus viewing as lazy and not worthy of an education. On the other hand, gatekeepers may not be aware of the issues with deafness and standardized testing and make a decision that forever will impact deaf/HOH peoples' lives especially if it is a decision regarding to college admission. This would compound the missed educational opportunities that normally happen to a deaf student. Third, counting on the standardized tests as the only reliable assessment tool for deaf students is not possible. There are too many extraneous factors that influence deaf students' performance on

standardized tests. Today's assessment of students in general is still at its earliest stage of evolution and that continuing development needs to occur appropriately.

Standardized testing is a danger to multiculturalism. These tests do not include histories and experiences of people that are not Caucasian (Bigelow, 1999). The standardized tests are Caucasian in nature and will not help minority students demonstrate their educational potential. For example, English idioms are not highly valued or used in the deaf community. Standardized tests include phrases that deaf people normally do not use in their conversations. Will glaring differences in cultures appropriately assess a deaf person's educational achievement?

#### *Discrimination*

African Americans, the disabled, Native Americans, Hispanic and many other groups of people that aren't white are considered minorities. Deaf people qualify as a minority group under disabilities if one is looking from a pathological point of view. Deaf people also qualify as a minority because many use American Sign Language as their language of choice, when English is the language that the majority use. This is looking at them from a cultural point of view. From either perspective, deaf people fall under the minority category.

Fleming and Garcia (1998) addressed whether or not standardized tests are fair to African Americans. SAT scores were collected from African Americans and Caucasian students from predominately black and white universities respectively. The results show that the mean of SAT scores of white students were higher than those of black students in white schools, and these were significantly higher than those of black students in black schools. This suggests the possibility that the black schools' curriculum may have more



emphasis on their ethnicity. Factors including socioeconomic status, level of parental support, budget issues at schools, and quality of teachers may affect students' academic progress. These factors may not be reflected on standardized tests. Black students in white schools do better on SATs than black students from black schools. This suggests that white schools' curriculum is more likely to match the standardized tests' items than the curriculum from the black schools. This might suggest to some that deaf students in mainstream schools may do better than those who go to a residential school for the deaf. However, studies show that deaf students who use sign language have better language development than those who do not sign. "That is, children who used signing were clearly superior in language development to those who had not" (Heller et al. 1998).

A study conducted by Luetke-Stahlman, Griffiths, and Montgomery (1999), found that 80% of all deaf/HOH students are now mainstreamed in public schools where knowledge of English vocabulary is in greater demand with newer textbooks than in the older textbooks. They report that parents and/or teachers who read to their children often see a marked increase in English acquisition and expressive skills, and the same thing occurs to deaf and HOH children. However the increase is not as high as it is with hearing children.

Luetke-Stahlman, Griffiths, and Montgomery (1999) conducted a case study of one deaf girl who was approximately 7 years old who had not been exposed to reading prior to age 4. She was adopted, uneducated, and without speech and language when she came to the United States at age 4. The subject was profoundly deaf. Her first three months of half-day public school program used primarily Signing Exact English (SEE 2) and then a residential program that used Pidgin Signed English (PSE). The following fall,

the subject attended a full-day public school program and the mode of communication at that school and at home was SEE 2. At second grade her English reading and language abilities weren't remarkably different than of her deaf/HOH peers. The subject showed a two-year expressive delay and a one-year receptive English delay when given formal tests such as the Clinical Evaluation of Language Fundamentals (CELF), Assessing Semantic Skills Through Everyday Themes (ASSET), and the Test of Language Development (TOLD).

The researchers used an ABAB single subject design sequence. The subject was to read several stories after being exposed to reading by parents and teachers and see if her command of English improved. The baseline was to show her current grasp of English, and after the first intervention; some aspects of grammar and rules of English did improve. During the unmediated baseline, results showed that the subject had continued to be correct as shown after her first intervention phase however, nothing was improved. During the second intervention phase, the subject improved from 64% from the first intervention to 82%. During the first baseline the subject often left out the verb to be. During intervention phase two, she used the verb to be correctly 72% of the time (Luetke-Stahlman, Griffiths & Montgomery, 1999). Before data collection, the researchers stated that the subject's district based reading assessment indicated that she had improved from "needing further development" to being a "progressing reader" to "being a strong narrative reader" by the end of data collection. In other words, reading to deaf and hard of hearing children consistently does help their English literacy in both acquisition and expression. This relates to the question of accessibility to standardized tests especially when it isn't the deaf/HOH child's fault if teachers in their classrooms do not have



reading activities, and/or that their parents do not read to them at home. The use of standardized tests discriminate against these children because of lack of opportunity for reading exposure at home and/or school as it does not show their potential. Scores only show whether or not they are literate not why they are literate or not.

Gronna, Jenkins, and Chin-Chance (1998) did a quantitative study on the performance of students with disabilities in a norm-referenced, statewide standardized testing program. They state that certain students were either exempted from testing or given testing accommodations (no explanation was provided as to what is meant by accommodations), for those with disabilities, limited English proficiency, and home schooled students. The purpose of this study was to analyze the results of Stanford 8 tests scores of Hawaiian students with disabilities, to compare scores with the larger Stanford 8 normative population. The results showed that students with disabilities did not perform as well as the national normative group. However, for each year the Stanford 8 tests were given, both groups (normative and students with disabilities) did better every time. This shows that there is progress with special education services, despite the negative light that special education services receive from the public. In other words, students with disabilities do score lower than their peers without disabilities. Deafness is generally considered a disability. However, this study did not specify how deaf children fared. Therefore, further research is necessary.

In research conducted by Bryant and Zurcher (2001), they focused on the validity and comparability of entrance examination scores after accommodations are made for students with learning disabilities. Their results showed that scores from tests with accommodations for students with learning disabilities aren't associated with grade point

average (GPA) and isn't a good predictor of their educational successes (Bryant & Zurcher, 2001). Similar findings are repeated by others such as Braun, Ragosta, and Kaplan (1986a), (1986b), Laing and Farmer (1984), and Ziomek and Andrews, (1996) (as cited in Bryant & Zurcher, 2001).

The literature in this subject area (Fleming & Garcia, 1998, Bryant & Zurcher, 2001, Gronna et al. 1998, Luetke-Stahlman et al. 1999 and Evans, 1998) consistently shows that minority groups do not do as well on standardized testing as the majority. However, they do not demonstrate that it is positively discrimination against them through testing bias which caused the lower scores, just that the scores were lower. Nonetheless, Fleming and Garcia's (1998) work suggests us that the "white" curriculum was more of a fit with standardized testing than the "black" curriculum. Also, the work of Evans (1998) and Luetke-Stahlman et al. demonstrate that communication that is lacking in quality and fullness for deaf students may lead to lower demonstration of knowledge (for tests) and less general knowledge than actual ability. Therefore testing may in fact predict "success" in academics, but not "ability" if educated properly. Therefore, while tests may measure a student's academic success well, they are not a reflection of ability. Finally, the studies of Gronna et al. (1998) and Bryant and Zurcher (2001) indicate that standardized testing, even with accommodations, may not improve a student's performance or may not correctly predict GPA (academic success) at all. So these studies together indicate that the use of standardized testing for minorities may discriminate against them by not testing what they know may not accurately predict academic success, and may cause teachers to underestimate students' ability.

*Language Issues*

Those who do not use English as a first language are often called a language minority. This applies to deaf and foreign students. Stoynoff (1997) studied factors associated with international students' academic achievement and found that a positive relationship exists between language proficiency and academic achievement. That positive relationship is, however, modest. Standardized tests assume that all test-takers are proficient in English. This assumption is dangerous for deaf students. They aren't necessarily proficient in English. Stoynoff (1997) suggests that students who have the motivation and the ability to keep abreast of their assignments and test-taking skills seem to earn better grades.

Kelly and Mousley (2001) wrote an article about a study they conducted with deaf students and solving word problems. They had deaf and hearing students solve mathematical problems in numeric, graphic and word problem formats. Some of these problems include word problems. They found that deaf students have a lower probability than hearing students of answering word problems correctly. Deaf and hearing students are comparable in solving the other problems that did not include words. Kelly and Mousley feel that the significant difference with answering word problems occurred only partly because of deaf students' difficulty with reading and understanding the language. Other contributing factors included computation errors (rather than procedural errors), leaving word problems blank, and a negative disengaged approach to the word problem solving tasks. This scenario can also happen to deaf students when faced with word problems provided by standardized tests.



Another study conducted by Maller and Ferron (1997) focused on intellectual testing (WISC-III factor invariance) across deaf and standardization norms. The results showed that the scores from deaf subjects had greater variability than the scores from hearing subjects. They conclude that etiologies of deafness may be a factor for children with undiagnosed cognitive impairments. They also raised the possibility of deaf children and their understanding of English language may be another factor. Finally, they concluded that there were many extraneous factors that may have affected the deaf children's scores on the WISC-III. In other words, potential undiagnosed cognitive impairments can be another factor to why standardized tests scores from deaf/HOH shall be viewed critically.

Language is a barrier for many deaf/HOH people. Standardized testing fails to remove that barrier by assuming that all deaf/HOH people can read, understand and express themselves fluently in English. Research discussed above has shown that deaf/HOH people struggle with English in different areas. It is almost like asking a Spanish-speaking person to read, understand and express themselves fluently in English without any concerns about the person's fluency.

#### *College Successes*

Schroedel, John, and Geyer (2001) examined long-term career attainments of deaf and hard of hearing college graduates. They report a positive finding that a majority of alumni participants were successful in their careers, making sustained progress in their career attainments, and were satisfied with their quality of life. This suggests that post-secondary education should be emphasized for deaf students. Standardized testing is a gatekeeper for them to be accepted to colleges, and this study should be seriously

considered for those whose scores are borderline, especially for people who are involved in admission processes for those who are deaf/HOH. Standardized scores from deaf/HOH should always be viewed with a critical eye, and to need to be complemented with other means of assessment to truly understand the big picture.

Peterson (2000) studied hearing underachievers and high achievers four years after high school graduation. Underachievers were those who have high grade point averages (GPA) in high school but were not involved in anything else (sports, clubs, organizations and so on). High achievers maintained a high GPA and were involved in some extracurricular activities. Peterson (2000) reported that the level of academic achievement during high school is positively related to years spent in college and involvement in campus activities- "47% remained high achievers in college (> 3.75 GPA), 44% became moderate achievers (3.35-3.74 GPA), and 9% became moderate underachievers (2.75 GPA). Among all who had been high achievers during high school, 21% experienced episodic underachievement (<2.75 GPA) during their college years and 20% ended up as underachievers" (Peterson, 2000). This suggests that students aren't necessarily underachievers according to stereotypes attached to them especially if they have low test scores. These students are highly intelligent, although they do not display it in a way that society expects. In other words, this means that deaf/HOH students may or may not be high achievers in high school, and may have done poorly on standardized tests, and may still end up as high achievers in college. Deaf/HOH students that were high achievers in high school, and had good scores from their standardized tests may end up as underachievers in college. Therefore, testing does not predict fully their college achievement.



Gatekeepers for admissions need to be aware of the issues related to deafness before making any admission decisions based solely on standardized tests. Research has shown that post-secondary education is indeed beneficial to deaf/hard of hearing students. Gatekeepers who are not aware of the issues of standardized tests and deafness may end up hindering deaf/HOH students' possible future success by not permitting them to be accepted to colleges.

### Method

#### *Purpose of Study*

The purpose of the study was to explore the relationship between entrance exams and students' academic successes. Success for this paper is defined by students' completion of a program of study and their cumulative grade point averages. Admission decisions fall on the shoulders of admission counselors, faculty/staff/program chairpersons, support departments, counselors and academic advisors of NTID and RIT. The present study addressed the following two questions:

1. What is the relationship between the California, and Michigan tests with each awarded degrees (Associate of Applied Science (AAS), Associates of Occupational Science (AOS), Baccalaureate of Science (BS), Baccalaureate of Fine Arts (BFA), Certificate (CT) and Diploma (DP))?
2. What is the relationship between standardized test scores such as the California Achievement Test (Reading Comprehension, Junior High Level, Form Z) and Michigan Test of Language Proficiency and cumulative GPA?

*Subjects/Participants*

A total of 905 deaf/HOH students at NTID or RIT enrolled in programs from 1990 to 1998 were included in this study. Of these students, 510 (56%) completed a degree. Information requested from the database included all entrance exams scores from the California and Michigan tests, degree of hearing loss, hearing status of students' parents, cumulative grade point average and type of degree program (AOS, AAS, BFA, BS, CT, and DP). Note that not all students had complete information in every category. Therefore, the actual student numbers vary per analysis depending on the variable being examined. With regard to parents' hearing status, a total of 881 students had parental information. Of these 881 students, 93% had two hearing parents, 2 % had one deaf parent, and 6% had two deaf parents. For each degree program, Table 1 shows the number of students and type of hearing loss for each ear (PTAR=right ear, PTAL=left ear). There was no statistically significant difference in hearing loss between any of the degree categories for either the right ear,  $F(6,792) = .12, p = .99$ , or the left ear,  $F(6, 791) = .17, p = .98$ .

Table 1

Number of students and their hearing loss in both ears per degree category.

Type of Degree	N	dB for PTAR	dB for PTAL
AAS	95	99 (17.1)	99.1 (16.2)
AOS	22	105.8 (14.5)	103 (12.1)
BFA	79	99.1 (15.3)	98.5 (16.6)
BS	253	101 (59.6)	101.3 (59.6)
CT	10	93 (17.1)	91.1 (18.4)
DP	8	95 (17.5)	93.3 (18.4)
No Degree	332	100 (52.6)	98.7 (53.3)

### *Procedures*

Data obtained from the NTID master student files and findings apply only to the NTID/RIT population sampled. The findings cannot be generalized to other university settings. The statistical tests used in the analyses included analysis of variance (ANOVA), Fisher's Protected Least Significant Difference (PLSD) for post hoc pair-wise comparisons, Chi-Square and Pearson  $r$ . An alpha level of .05 was used for all statistical tests.

### *Results*

The analyses examined the students' mean scores on standardized tests and type of degree they were awarded, followed by correlation analyses of cumulative GPA and test scores.



*California Reading Test*

Table 2 shows the group means for reading grade level of the students and the California Reading Test for each degree level, as well as for those students who left the Institute without a degree. An overall ANOVA test showed that there was a significant difference among degree levels for the group means on the California Reading Test,  $F(6, 611) = 3.81, p = .001$ .

Table 2

Mean reading grade level per type of degree earned.

Type of Degree	N	Mean Reading Grade Level
AAS	78	9.6 (1.9)
AOS	19	8.8 (1.5)
BFA	53	9.0 (2.3)
BS	178	9.9 (2.5)
CT	7	8.8 (3.2)
DP	7	9.5 (1.1)
No Degree	276	8.7 (3.4)

Subsequent post-hoc analyses using Fishers PLSD to examine pair-wise comparisons between the means showed the following differences: AAS degree students ( $M = 9.6$ ) had a significantly higher reading level than the students who did not earn a degree ( $M = 8.7$ ), Fishers PLSD critical value = .72,  $p = .0089$ . BS degree students ( $M = 9.9$ ) also had a significantly higher reading level than the students who did not earn a degree ( $M = 8.7$ ), Fishers PLSD critical value = .54,  $p = <.0001$ . BFA degree students

( $M = 9.0$ ) had a significantly lower reading level than the BS degree students ( $M = 9.9$ ), Fishers PLSD critical value = .88,  $p = .0429$ .

Interestingly, no significant differences occurred when comparing BFA students ( $M = 9.0$ ) and the students in the no degree category ( $M = 8.7$ ). This may suggest that higher level reading skills are not necessary for success in arts programs. Also, no significant differences occurred when comparing BS ( $M = 9.9$ ) and AAS degree ( $M = 9.6$ ) programs and the California Reading Test scores. This suggests that reading levels are similarly important for BS and AAS degree programs. Students in both programs are required to complete Writing and Literature I, II and other liberal arts core courses for degree completion. This also suggests that students with AAS degrees have approximately the same reading ability as students with BS degrees.

Table 3 shows the type of degrees earned per the students' reading grade level range. A Chi-square statistical test,  $\chi^2 = 82.9$ ,  $df = 25$ ,  $p = .0001$ , showed a significant association between reading levels and type of degree earned. This indicates a differential pattern of degrees earned between the various reading grade level ranges. Note that approximately 70% of the students in the 10<sup>th</sup> and 11<sup>th</sup> grade reading ranges earned a BS or BFA degree. For the 12<sup>th</sup> grade level readers, 84% earned a BS or BFA degree. While the evidence suggests that reading ability is associated with type of degree, it does not mean that lower reading scores will absolutely prevent one from earning a BS degree as 14% of students in the  $< 7.5$  reading range earned a BS degree. However, the likelihood of successful degree completion at the BS level is clearly reduced. These findings suggest that students with better reading abilities may choose either an AAS or a BS degree as



both degree programs require successful completion of Writing and Literature I, II and other liberal arts core courses for degree completion.

Table 3

Percentage of students who earned a degree per range of reading grade level scores.

Range of Reading Scores	N	AAS	AOS	BFA	BS	CT	DP
<7.5	4	7%	36%	28%	14%	7%	7%
7.5-8.9	43	30%	12 %	30%	26%	0%	2%
9.0-9.9	78	36%	6 %	19%	36%	1%	1%
10.0-10.9	107	19%	3%	8%	64%	3%	3%
11.0-11.9	56	18%	1%	1%	69%	1%	0%
12.0-12.9	25	16%	0%	8%	76%	0%	0%

#### *Michigan Language Proficiency Test*

Table 4 shows the group means of the students and the Michigan Language Proficiency Test for each degree level, as well as for those students who left the Institute without a degree of any kind. An overall ANOVA test showed that there was a significant difference among degree levels for the group means on the Michigan test,  $F(6, 529) = 9.16, p = .0001$ .

Table 4

Mean score of students on the Michigan Test of Language Proficiency per type of degree earned.

Type of Degree	N	Mean score on Michigan Test
AAS	75	77 (9.7)
AOS	18	71 (9.7)
BFA	50	76 (11.0)
BS	165	84 (8.9)
CT	6	76 (10.4)
DP	7	71 (9.7)
No Degree	215	81 (11.3)

Subsequent post-hoc analyses using Fishers PLSD to examine pair-wise comparisons between the means showed the following differences: AAS students ( $M = 77$ ) had a significant lower language skill level than the students who did not earn a degree ( $M=81$ ), Fishers PLSD critical value = 2.7,  $p = .0023$ . BS students ( $M = 84$ ) had a significantly higher reading level than the students who did not earn a degree ( $M=81$ ), Fishers PLSD critical value=2.1,  $p=.0424$ . BFA students ( $M=76$ ) had a significantly lower average score than the BS students ( $M = 84$ ), Fishers PLSD critical value = 3.3,  $p = <.0001$  which further suggests not as high of language skills are needed to be successful in a BFA program.

Table 5 shows the percentage of students earning a type of degree per their range of scores on the Michigan Language Proficiency Test and type of degree. A Chi-square statistical test,  $\chi^2 = 77.21$ ,  $df = 15$ ,  $p = .0001$ , shows a significant association in degree

patterns between reading levels and percent of students who earned a BS degree as well as AAS degree. While these findings suggest that language skills relate with type of degree, it does not mean that lower scores will prevent one from earning a BS degree as 25% of students earned a BS degree with scores lower than 69 on the Michigan Test. This further suggests the notion that students with better scores choose either an AAS or a BS/BFA degree as these degree programs require successful completion of Writing and Literature I, II and other liberal arts core courses for degree completion. However, note that 71% and 75% of the students with scores between 80-89 and 90-99 respectively complete a BS degree program as opposed to only 12% and 19% in BFA/AAS degree programs.

Table 5

Percentage of students who earned a degree per range of Michigan scores

Range of Michigan Scores	N	AAS	AOS	BFA	BS	CT	DP
<69	52	25%	13%	27%	25%	3%	6%
70-79	95	41%	8 %	30%	30%	1%	3%
80-89	115	12%	2 %	12%	71%	3%	0.1%
90-99	59	15%	0%	1%	75%	0%	0%

#### *Cumulative GPA and degree programs*

Group means for cumulative grade point average per degree programs is shown on Table 6. An overall ANOVA test showed a significant difference among degree levels for the group means on cumulative grade point average (GPA),  $F(6, 820) = 30.03, p = .0001$ . Subsequent post-hoc analyses using Fishers PLSD to examine pair-wise comparisons between the means showed that students in all the completed degree groups



had significantly higher mean cumulative GPAs compared to the students who did not earn a degree.

- 1.) AAS students, Fisher's PLSD critical value = .143,  $p = <.0001$
- 2.) AOS students, Fisher's PLSD critical value = .270,  $p = .0009$
- 3.) BS students, Fisher's PLSD critical value = .102,  $p = <.0001$
- 4.) BFA students, Fisher's PLSD critical value = .151,  $p = <.0001$
- 5.) CT students, Fisher's PLSD critical value = .383,  $p = .0097$
- 6.) DP students, Fisher's PLSD critical value = .447,  $p = .0008$

In other words, all students who completed some type of degree programs have significantly higher cumulative GPAs than those who left without a degree. Interestingly enough, those who are enrolled in a diploma program had the highest mean cumulative GPA (3.1) than any other degree program which needs to be addressed in a further study (Table 6).

Table 6

Mean cumulative grade point average per degree program

Degree program	N	Mean
AAS	100	2.9 (.6)
AOS	23	2.8 (.7)
BFA	87	2.9 (.4)
BS	275	3.0 (.4)
CT	11	2.8 (.4)
DP	8	3.1 (.4)
No Degree	323	2.3 (.8)

Entry scores from California and Michigan tests do not predict cumulative GPA. However, differential entry scores are associated with the type of degree completion. Gatekeepers must keep several questions in mind when deciding to admit a student to college: Will he/she stay at the same college and graduate? Will he/she not do well and end up leaving college? Decisions one make will impact on each student's future.

### Discussion

Even though the use of standardized tests for assessing minority and particularly deaf students' achievement is in question, there are many reasons for using standardized tests. Popham (2001) discussed the uses that standardized tests provide for parents and teachers. Standardized tests can be used to assess a student's achievement. For example, low reading scores and high math scores will tell teachers the student's weakness in reading and strengths in mathematics. This will enable educators to strengthen this student's potential in math, and to develop ideas on how to improve reading. Parents can use the standardized test scores to compare their child against the performance of a national comparison group. For example, a mother will see that her daughter rated in the 78<sup>th</sup> percentile in the reading group, and in the 50<sup>th</sup> percentile in the math group. The mother can then use that information to help her daughter with her academic strengths and weaknesses or get additional tutoring if needed.

Students selected for special programs are assessed by the use of standardized tests. Popham (2001) emphasized that programs can be either an enrichment activity for gifted children or a remedial activity for low-performing children. Some of these programs are limited to a certain number of students. This type of assessment is useful for selecting students from a large applicant pool. This method is also useful for district

educational policymakers when they are trying to decide monies for additional staff developmental support, after school tutorial sessions and so on.

Therefore, standardized testing can be used as a tool for assessment, however, it should not be used alone to make any sort of decisions. Standardized tests can be used along with portfolios. Portfolios may better show deaf students' true ability and achievement in school. For example, the RIT's BFA degree programs require art portfolios in order for students to be considered for entry into their program. This can work well for deaf students as both their weaknesses and strengths will be included in the overall picture of their aptitude and achievement. For example, deaf people typically have difficulty with English in the reading and written forms. A portfolio will show the deaf person's best efforts and that would be a better indicator of what level that person may be in, rather than using standardized tests. The tests will limit the wide continuum of work that deaf students can show.

Walter (1998) conducted a study with American College Test, Inc. to determine whether or not the ACT scores are more reliable than SATs scores for the deaf and HOH students entering National Technical Institute for the Deaf. The study suggests that the ACT assesses the deaf and HOH students in a more consistent way than the SATs. This study indicates that the ACT may be used as a tool for assessment of deaf and HOH students applying to NTID.

There is a need for more research on how standardized testing can be used as a tool for assessment. Popham (2001) is right; we need to start seeing the other side of standardized tests and find their best uses. The impact on alternative assessment tools and deafness needs to be explored.



Standardized testing has shown not to be equally fair for everyone. Research has shown that factors such as test discrimination can influence on how well (or bad) the students perform. Issues of language acquisition are also a factor that has potential to skew the picture standardized test scores paint. Post graduation studies have shown that standardized testing is not a good indicator of a student's potential success or failure after high school.

Parents and teachers can use standardized test scores as a tool in order to understand the progress their child is making in education. It can also be productive in understanding where the child is in normative issues such as finding out if the child is up to par with the rest of the county, town, state, and country with sensitivity to other influencing issues (cultural, accommodations, and so on). Emphasis on understanding the individual as a whole is much more important than looking at standardized tests alone.

#### Implications for practice and future research

There are a high number of deaf students that leave school for various reasons. Further research is needed to explore issues that students have that resulted in them not completing a degree. More study is needed to explore demographics of these students used in this study and to compare these demographics with success in college. For example, studies of gender, ethnicity, degree of hearing loss, onset of deafness, type of primary and secondary schools, preferred communication modes and so on should be compared with degrees earned in college, entrance college test scores, and cumulative GPAs. Results of these studies may reveal potential issues that is being overlooked by

gatekeepers such as discrimination, disability, communication issues, quality of education, and so on that may be preventing one from rightful entry to college (or not).

While this study did show a significant association between reading and language levels relative to degree completion, it did not show a predictive relationship between entrance college scores and deaf students' GPAs in college. Gatekeepers should carefully take these findings into consideration. Consideration of each student's potential should involve a broad range of assessment which can include entrance scores, interviews, portfolios, resumes, and essays. The more information gatekeepers get from a student is better as the student is showing a wide range of skills (or lack thereof) that he/she is able to show using different mediums. Many deaf students are limited to taking tests that often fail to show their best skills.

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