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Ethnic and Gender Differences in the Use of DISCOVER:

A Multi-Cultural Analysis

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Abstract

The purpose of this study was to examine ethnic and gender differences in using DISCOVER, a performance-based assessment, for identifying gifted students from diverse ethnicities. DISCOVER is an acronym which stands for *D*iscovering *I*ntellectual *S*trength and *C*apabilities while *O*bserving *V*aried *E*thnic *R*esponses. The sample consisted of 941 boys and girls from grades K-5 from three countries. The participants were White Americans, African-Americans, Hispanics, Native-Americans, South Pacific/Pacific Islanders, and Arabs. The 5 X 6 MANOVA (activity x ethnicity) yielded a significant interaction, but no main effect for either activity or ethnicity was found. Plots of the interaction showed that South Pacific/Pacific Islanders scored highest on Oral Linguistic whereas White Americans scored highest in Math and Native Americans scored highest in Spatial Artistic activity. No gender differences in identification were found. All ethnic groups were well represented among identified students, suggesting that DISCOVER might be used in different countries and with culturally diverse students.

Keywords: Gifted education, performance-based assessment, multiple intelligences, identification procedures, ethnic differences.

Ethnic and Gender Differences in the Use of DISCOVER: A Multi-cultural Analysis

Giftedness can be found in all cultures and is expressed through a variety of behaviors (Baldwin, 2005). Yet, the identification of giftedness has been a complex matter, loaded with controversies and debated extensively. As Elbert Hubbard, the American philosopher and writer, aptly phrased it long before the formal assessment of giftedness had begun: “There is something that is much more scarce, something finer far, something rarer than ability. It is the ability to recognize ability” (Elbert Hubbard Quotes).

Traditionally, students identified as gifted were those who scored at or above the 97th percentile in either standardized achievement or intelligence tests. However, more often than not, students from culturally diverse groups fail to meet this criterion (Ford, Harris, Tyson, & Trotman, 2002) and, consequently are often under represented in programs for the gifted, an under representation estimated to range between 30% to 70% relative to their percentage in the population (Galbeko & Sosniak, 2002). This alarming situation has led some scholars to call for a paradigm shift in identification procedures (Maker, 1993; Sarouphim, 2005), mostly to replace standardized tests with the use of instruments that can detect the strengths, talents, and abilities of these students, culturally-bias free instruments based on solving real problems. Thus the name “authentic assessment” is given to these relatively new identification procedures.

The use of authentic assessment, also called performance-based and alternative assessments for identifying gifted students, has witnessed an increase in the last two decades (Baldwin, 2005). The increased use of these assessment procedures has

coincided with the rise of non-traditional theories of intelligence (e.g., Gardner, 1983; Sternberg, 1991) and unconventional conceptions of giftedness (e.g., Maker, 1993). Advocates cite many advantages for the use of these instruments, such as assessment of higher-order skills, reducing the gap between testing and instruction, coverage of broad areas of intelligence, and assessing students in life-like and complex situations (Maker, 1993; O'Neil, 1992). Ortiz (2002) suggested that the use of authentic assessment provides qualitative and valuable data on the ability of students through observing the strategies they use while completing items on the test, thus providing insights as to how they are reasoning about information. Another significant advantage often cited in favor of performance assessments is their effective use with culturally diverse groups (Whiting & Ford, 2006).

Several studies have shown that when performance-based assessments are used for identification purposes, the number of identified minority students increases dramatically. Also, when placed in programs for the gifted based on high ratings in authentic assessments, minority students fare well (e.g., Borland & Wright, 1994; Clasen, Middelton, & Connell, 1994; Hafenstein & Tucker, 1994; Maker, 1992; Reid, Udall, Romanoff, & Algozzine, 1999; Sarouphim, in press). However, performance-based assessments are not without drawbacks. Opponents of the use of these instruments point to their many limitations, such as domain under representation, lack of sound psychometric properties, and laborious administration (Frechtling, 1991; Plucker, Callahan, & Tucker, 1996).

The purpose of this study was to investigate the effectiveness of DISCOVER, a performance-based assessment, in identifying gifted students from six different

ethnicities: White Americans, African-Americans, Hispanics, Native-Americans, South Pacific/Pacific Islanders, and Arabs. Data were collected in the United States, Bahrain, and Lebanon. Another purpose was to investigate gender differences in identification among these ethnicities. A third purpose was to examine whether through the use of DISCOVER, a larger percentage of students than the traditional 3% yielded by standardized tests would be identified. DISCOVER is an acronym that stands for *D*iscovering *I*ntellectual *S*trength and *C*apabilities while *O*bserving *V*aried *E*thnic *R*esponses.

Research on DISCOVER

DISCOVER is grounded in Gardner's (1983) MI theory and based on Maker's (1993) definition of giftedness as "the ability to solve the most complex problems in the most efficient, effective, or economical ways" (p. 71). DISCOVER was developed to identify gifted students from culturally diverse groups (Maker, Nielson, & Rogers, 1994), and was administered to diverse communities in the United States as well as in other countries: Canada, Australia, England, France, Lebanon and Bahrain. The data collected have served as the basis for research on the reliability and validity of the instrument.

Inter-rater reliability. In a triangulated inquiry on the inter-rater reliability of DISCOVER, Sarouphim (1999) investigated the alignment of ratings given to students by three independent raters: DISCOVER observers, classroom teacher, and the researcher. The results showed that the DISCOVER observers, classroom teacher, and researcher gave similar ratings to students in the linguistic, spatial, and mathematical intelligences assessed in DISCOVER through structured activities, but their ratings were not as similar in the personal and bodily-kinesthetic intelligences assessed in DISCOVER through

unstructured tasks. The researcher concluded that the DISCOVER observers were more effective in appraising students' intelligences when the appraisal was made through specific activities than when it depended on observing unstructured behavior. The researcher recommended that specific activities be developed for accurate appraisal through DISCOVER of the whole spectrum of multiple intelligences.

Griffiths (1996) conducted two studies on the inter-observer reliability of DISCOVER. In the first study, two observers separately watched videotapes of five observation sessions of the Spatial Artistic activity. Participants were 25 Navajo children ranging in age from 9 to 13 years. As they viewed tapes, the researchers sketched the children's constructions and took notes in much the same way as the original observers in the tapes did. Then, each of the researchers independently classified the children's problem-solving ability according to the four rating categories of *Unknown*, *Maybe*, *Probably*, and *Definitely*. A correlation analysis yielded positive and significant indexes, with the highest being 0.91, indicating a high agreement among the three observers. Percentages of agreement using Cohen's Kappa ranged from 75 to 100%. In the second study, participants were observed in a live setting. The researcher as well as six observers with different levels of experience (novices, moderate experience, and experts) watched the students perform the Spatial Artistic, Spatial Analytical, and Oral Linguistic activities. The researcher and observers recorded each separate notes. Participants were 91 students ranging in age from 5 to 11 years. Cohen's Kappa indicated an agreement between the researcher and all six observers ranging from 80 to 100%, with the highest agreement being between the researcher and the expert observers and the lowest between the researcher and the novices. Griffiths concluded that the inter-observer reliability of

DISCOVER was high and that levels of observers' experience affected slightly, but not significantly their rating of students' problem-solving abilities.

Fit between DISCOVER and MI theory. Sarouphim (2000) investigated the alignment of DISCOVER with MI theory through a series of inter-observer correlations between activities designated to assess different abilities. The sample consisted of 254 elementary students, predominantly from economically disadvantaged Native American and Hispanic groups. The results showed low inter-observer correlations across grade levels between the activities that measure different intelligences (e.g., linguistic and spatial activities) and moderate to high correlations between activities that measure related intelligences (e.g., oral and written linguistic), indicating that students identified in one intelligence were not necessarily found gifted in the other intelligences. The results suggested that the different DISCOVER activities may measure different intelligences, a finding which supports the consistency between DISCOVER and Gardner's MI theory.

In another study, Sak and Maker (2005), examined the assessment of students' divergent and convergent abilities in the DISCOVER Math activity. A related purpose was to assess the construct validity of the Problem Continuum Matrix developed by Schiever and Maker (1997). Participants consisted of 857 students in grades 1 to 6. The students belonged to different ethnicities: Native Americans, Hispanic, African American and Caucasian. Convergent and divergent thinking were measured through examining students' answers to well-defined problems (convergent) and to ill-defined problems (divergent). Convergent thinking was measured through fluency (the number of problems solved correctly) and divergent thinking was measured through a combined variable of originality, flexibility, and elaboration (OFE). Correlations between students' fluency and

their OFE scores showed a positive and moderate strength, which indicates the existence of a relationship between convergent and divergent thinking. However, the relationship was not very strong, suggesting the effectiveness of DISCOVER in assessing and distinguishing between the two kinds of thinking. The results also provided evidence for the construct validity of the Problem Continuum Matrix.

Comparative and predictive validity. Griffiths (1997) examined the comparative validity of DISCOVER with the WISC-III. The sample consisted of 30 Mexican American low-income children whose ages ranged between 9-11 years. The focus was on investigating the relationship between students' ratings on each of the DISCOVER activities and their scores on the corresponding WISC-III subtests. Although overall students' ratings in the two measures were different (i.e., students identified as gifted through DISCOVER did not necessarily have IQ scores in the top 3%), analyses of separate activities corresponding to the different intelligences (e.g., math, linguistic, etc.) showed close resemblance, indicating evidence for the concurrent validity of DISCOVER with WISC-III.

In two revealing studies, Sak and Maker (2003), investigated the predictive validity of DISCOVER. In the first study, children were administered DISCOVER when they were in kindergarten, then six years later when they were in six grade, comparisons were made between their kindergarten DISCOVER ratings and their scores on three traditional instruments: Stanford 9 Achievement Test, the Arizona Instrument to Measure Standards (AIMS), and end-of-year English, Math, and Science school grades. The students belonged to different ethnicities, namely Whites, Hispanics, and Native Americans. The results showed that students who were identified as gifted through DISCOVER had

significantly higher scores than their counterparts on the three other measures. In the second study, the academic performance of 84 culturally diverse kindergarten students identified as gifted through DISCOVER was assessed three years later, when the students were in 3rd grade. The generated regression model accounted for 22% of the variance in Stanford Reading scores (p=0.03) and 25% of the variance in AIMS Reading score (p= 0.03). These results give evidence for the predictive validity of DISCOVER.

In another study, Sarouphim (in press) examined the effectiveness of DISCOVER in identifying gifted Lebanese students. The sample consisted of 248 boys and girls from grades 3-5 at two private schools in Beirut, Lebanon. Students' DISCOVER ratings were compared to their school grades and their scores on the Raven Standard Progressive Matrices (RSPM). The results showed evidence for DISCOVER's concurrent validity with RSPM, as correlations between students' DISCOVER ratings in spatial intelligence and their Raven scores were high, whereas correlations between students' DISCOVER ratings in linguistic intelligences and their Raven scores were low. Also, the students' school grades matched their DISCOVER ratings. Interviews with teachers and parents corroborated the results, with a few exceptions. Of the total sample, 14.5% were identified, with no gender differences.

Identification of ethnic minorities. In a study that extended from 1998 to 2001 about increasing the percentage of culturally and linguistically diverse (CLD) students in programs for the gifted, the results showed that through the use of DISCOVER, the percentage of LEP students placed in programs for the gifted increased from 0.16% in year one to 5.3% in year four. The study, which took place in one school in a Southwestern State, showed that out of 1250 students, only one English Language

Learner (ELL) out of 635 LEP student was placed in the school's program for the gifted in 1998, prior to the use of DISCOVER for identification purposes. However, in 2001, the school's program for the gifted included 50 ELL students out of 936 students, a 33-fold increase due to the use of DISCOVER for identifying gifted learners (Powers, 2003). Other studies also have shown that through the use of DISCOVER, high percentages of identified students are identified (Sarouphim, 2002, 2005, in press).

Gender and ethnic differences. Finally, Sarouphim (2005) examined the use of DISCOVER with a sample of 955 students taken from grades K-12 in10 schools in Arizona. The results revealed a good fit between DISCOVER and MI theory; also, no significant ethnic or gender differences in identification were found. A total of 20.9% participants were identified, suggesting that DISCOVER might contribute to diminishing the problem of minority under representation in programs for the gifted.

In sum, research on DISCOVER has yielded mostly positive results on its effectiveness in identifying students from culturally diverse groups. In the current study, the purpose was to examine ethnic and gender differences in the use of DISCOVER for identifying K-5 students from various ethnic groups, residing in four different countries.

Method

Sample

The sample of this study consisted of 941 students, 49% males and 51% females, from grades K-5. The participants belonged to six different ethnicities: White Americans (14.7%), African-Americans (13.9%), Hispanics (9.9%), Native-Americans (12.9%), South Pacific/Pacific Islanders (12.8%), and Arabs (35.9%). Participants were from low to middle socio-economic classes and were taken from schools located in the United

States, Lebanon, and Bahrain. (See Table 1 for the participants' gender and ethnic distribution).

Procedures

All participants were given the DISCOVER assessment. Trained observers conducted all administrations in the participants' classrooms, according to standard procedures (see details below in section on Instrument).Whenever needed, instructions were given in both English and the native language of the children. At all times, children were encouraged to use the language with which they felt most comfortable. Data were collected over a period of 10 years (1997-2007).

Instrument

The DISCOVER assessment is performance-based and includes tasks which increase progressively in complexity and openness. Basically, three activities are performed in class during the administration to assess spatial artistic, spatial analytical, and oral linguistic abilities. Logical-mathematical and written linguistic intelligences are measured a day or so following the classroom assessment through paper-and-pencil tasks. Bodily-kinesthetic and the personal intelligences are assessed by observing the behaviors of students throughout the group administration, which lasts about two and a half hours.

The DISCOVER assessment measures the different intelligences by using separate activities across intelligences and age levels. Different tasks are designed for grade levels from kindergarten through grade 12. Four versions of the assessment exist depending on grade level: K-2, 3-5, 6-8, and 9-12. The focus in this study is on the DISCOVER versions for grades K-2 and 3-5. The following is a brief description of the activities and processes of administration and scoring.

Spatial artistic. Students are provided with colored cardboard pieces of different shapes, designs, and sizes and asked to make different constructions with these pieces. Observers note the complexity of the constructions, their resemblance to the designs the children are attempting to make, their symmetry or asymmetry, their originality, and whether they are two or three-dimensional.

Spatial analytical. Each student is given a set of Chinese Tangrams of different geometrical shapes and asked to solve puzzles in a booklet arranged in ascending order of difficulty. Observers note the speed and accuracy of the students' work. They also note behaviors such as taking apart a puzzle to try a different set of pieces, persisting in difficult tasks, and showing enjoyment of the task.

Oral linguistic. To assess oral linguistic intelligence, students are given an array of toys and are asked to engage in categorization and description tasks before they tell a story of their choice. Observers either write the stories verbatim or tape-record them according to the students' preference. They note whether stories have an appropriate sequence of events and the linguistic quality of the story.

Written linguistic. A day or so prior or subsequent to the classroom administration, students write a story on a subject of their choice. In kindergarten, children make a drawing then tell about it as the teacher writes what the child says. Two members of the DISCOVER team separately evaluate the written stories. If the two evaluators disagree on their assigned classification, they meet and discuss the product characteristics until they reach a consensus. A third evaluator might be consulted if consensus cannot be reached. Evaluators look for the complexity and originality of products.

Logical-mathematical. In grades 1-5, worksheets consisting mostly of open-ended numerical problems are used to assess this intelligence. The problems increase in openness and difficulty, with the last problem consisting of "problem-finding", that is creating as many problems as possible. Observers note the number of correct problems as well as the use of strategy and evidence of flexible, elaborate, or original thinking.

Interpersonal, intrapersonal, and bodily-kinesthetic. Although these intelligences are not measured through specific activities, behaviors corresponding to students' strengths in these intelligences are noted by the observers. For example, statements such as "I can't give up now, I know I can solve this puzzle" is considered to be evidence of strength in intrapersonal intelligence; cooperative behavior in the form of helping a classmate to finish a task is considered to be evidence of strength in the interpersonal intelligence, and finally incorporating one's own body into a construction or forms of graceful movements are noted as evidence of strength in bodily-kinesthetic intelligence.

The DISCOVER administration takes place in the classroom. Children sit in groups with one trained observer for 1 to 5 children. Each observer takes notes and records observed behaviors on standard sheets while the classroom teacher gives instructions in the children's dominant language. Observers pay attention to the children's problem-solving process as well as to their products. To avoid observer bias, observers rotate at the completion of each activity; thus each child is observed by at least two persons during the administration (Maker, 1992).

Following the administration, all observers meet to discuss the students' strengths and complete a behavior checklist on each child. Observers classify children's strengths in each activity into four possible categories ranging from "no strength observed" to a

"definite strength observed" using rating categories. The category *Definitely* corresponds to high ability or giftedness in that particular intelligence assessed by its corresponding activity. A child given a *Definitely* rating in at least two of the activities is usually identified as gifted. In some school situations, a criterion of three *Definitely* ratings is used to limit the number and percentages of students identified.

Results

Data analysis involved two stages: at first, all data were coded by ethnicity and gender, then statistical analyses (descriptive and tests of significance) were performed on all pooled data.

Ethnic differences in activity. To determine whether ethnic differences existed in the ratings given to students in each of the DISCOVER activities (i.e., Spatial Artistic, Logical-Mathematical, Spatial Analytical, Oral and Written Linguistic activities), a 5 x 6 MANOVA (activity x ethnicity) was performed. Data were coded as follows: 1=*Unknown,* 2=*Maybe*, 3=*Probably*, and 4=*Definitely*. The analysis yielded a significant interaction effect for ethnicity by activity (F[5,793], = 6.98, p = .03), with a moderate effect size of 0.24. Plots of the interaction revealed that Native Americans scored significantly higher (see Table 2) than the other groups on the Spatial Artistic activity ((2.98); whereas South Pacific/Pacific Islanders scored significantly higher on the Oral Linguistic activity (3.00), and White Americans scored significantly higher in Math (2.87). No main effect for activity (F[5,793) = 1.21, p = .215) or ethnicity (F[25,3965] = 4.98, p = .03) was found.

Gender and Ethnic differences in identification. Using the criterion commonly adopted for identification in DISCOVER, students given the *Definitely* rating in at least

two of the activities were considered gifted in this study. As shown in Table 3, participants from the six different ethnicities who fulfilled this criterion were a total of 217 (101 boys and 116 girls), constituting 23% of the total sample. A Chi-square test of significance was performed to determine whether the differences in the numbers of identified students across the six different ethnic groups were statistically significant. The results showed significant differences for ethnicity, $\chi 2(5,217) = 81.2$, $p = 0.001$, with a moderate effect size of 0. 39. As shown in Table 3, the ethnic group with the highest percentage of identified participants was the South Pacific/Pacific Islanders (37.5). The percentages of identified students from the other groups were as follows: Native Americans (25.6), White Americans (24.6), Hispanics (21.5), Arabs (20.1), and African Americans (14.5). No gender differences in identification were found, $\chi 2(1,217) = 3.01$, ns.

Discussion

The purpose of this study was to investigate the effectiveness of DISCOVER, a performance-based assessment, in identifying gifted students from six different ethnicities: White Americans, African-Americans, Hispanics, Native-Americans, South Pacific/Pacific Islanders, and Arabs. The participants resided in the United States, Bahrain, and Lebanon. Another purpose was to investigate gender differences in identification among these ethnicities. A third purpose was to examine whether through the use of DISCOVER, a larger percentage of students than the traditional 3% yielded by standardized tests would be identified.

Some of the results were expected, but others were not. One of the expected results was the high percentage of identified students, a finding which corroborates the

results of previous research on DISCOVER (e.g., Sarouphim 2002, 2005, in press). However, the surprising result was the extremely high percentage of South Pacific/Pacific Islanders identified (37.5%). Obviously, this high percentage indicates a high number of possibly falsely identified students, as giftedness is not usually as prevalent in any given population. However, one has to keep in mind that through DISCOVER, three different intelligences are identified. If one assumes that 3 to 5% of students are gifted in each of the three areas, the expectation is that at least 15% in any given population will be gifted. In addition, different patterns of ability exist within these three areas. For example, oral and written linguistic activities are obviously related, as both are designed to identify giftedness in linguistic intelligence. Hence, these different patterns of ability might explain the identification of higher percentages of students. Nevertheless, the extremely high percentage of identified South Pacific/Pacific Islanders is a problematic finding that needs to be addressed and thoroughly investigated in future research.

Another unexpected result is the significant interaction effect between ethnicity and activities. In previous research on DISCOVER, no such differences were found (Sarouphim 2002, 2005). One possible explanation for these differences might be embedded in what is considered important in a particular culture. For example, for Native Americans, art is greatly valued and for the South Pacific/Pacific Islanders, story telling is considered important for the transmission of values from one generation to the next. One important feature of DISCOVER is that giftedness is not assessed through a pre-set criterion; rather, giftedness is measured as it is defined in a particular culture and respective school setting. The instrument taps into students' abilities as they are manifested in a particular culture, a characteristic common to authentic assessment,

which makes DISCOVER functional in a variety of cultures and with students from different ethnic groups.

An important finding is the lack of significant gender differences in identification, suggesting that DISCOVER does not yield any gender bias. This result is congruent with other studies on DISCOVER in which no gender differences were found (e.g., Sarouphim, 2005, in press).

Another important finding is the high percentage of identified students (23%). This finding is compatible with the results found in other studies in which performance-based assessments were used for identification purposes (e.g., Borland & Wright, 1994; Clasen et al., 1994; Hafenstein & Tucker, 1994; Reid et al., 1999). Even though the results showed significant ethnic differences in identification favoring the South Pacific/Pacific Islanders, all ethnic groups were well represented in the sample of identified students, yielding a much higher percentage than the regular 3% (or less for minority groups) commonly found through the use of standardized IQ and achievement tests. This is a noteworthy finding, which suggests that DISCOVER might be used to help reduce the problem of minority under representation in programs for the gifted. In addition, this finding might also indicate that the assessment is able to tap into the strengths of students from a wide variety of cultures, thus making DISCOVER a promising instrument to be used with different populations and not just in the United States, the country where it originated.

Ultimately, the effectiveness of any instrument is related to its validity and reliability. That is, how consistent student's ratings are across observers, and how well identified students fare in the ensuing placement programs. Although data on the

reliability and validity of DISCOVER do not exist for all data presented in this study, available data provide support for both the reliability and validity of the instrument (e.g., Griffiths, 1996, 1997; Sak & Maker, 2003; Sarouphim, 2002, 2005, in press). In previous studies, the results showed high inter-rater reliability, and high concurrent and predictive validity when used to predict standardized test scores, students' grade-point average, and teachers' and parents' nominations, providing evidence for the high reliability and validity of the instrument (see section above on Research on DISCOVER).

In conclusion, DISCOVER seems to be a promising assessment for identifying students from diverse populations, as indicated by available findings. However, more research is still needed before solid conclusions on the effectiveness of this instrument could be drawn.

Implications for future research

Further research must focus on the reliability of DISCOVER over time (test-retest reliability) as well as on the construct validity of the instrument. One recommendation that stems from this study is to investigate further the performance of the South Pacific/Pacific Islanders to shed light on their outstanding performance on DISCOVER. Perhaps the difficulty levels of the tasks need to be adjusted for a more valid assessment of the strengths of this particular population of students.

Moreover, future research must focus on the adaptability of the instrument to the different cultures. DISCOVER was developed in the United States, originally to identify gifted minority students. At this time, the instrument's use has expanded to the majority culture and also to countries other than the United States. Studies on how well the

instrument is faring in each of these countries in terms of students' identification and placement in programs for the gifted, are needed.

Qualitative studies based on observation and interviews could be valuable as well. For example, studies in which students, teachers, parents, and administrators are interviewed about their views of the instrument might provide insight into the adequacy of the tasks and the materials used in DISCOVER. Also, observing students perform the DSICOVER tasks with a focus on the processes and strategies that they use (rather than just for identification purposes) might also provide data on the construct validity of the instrument.

Implications for Practice

If giftedness is found in every culture (Baldwin, 2005), educators everywhere must strive to identify students with high abilities so they can provide them with the nurturing and support they need for growth and advancement. Gifted students are the promise for a better future; this is particularly significant in developing countries, such as Lebanon where the population has been ravaged by multiple wars, strife and hardships. Before developing adequate programs for gifted students, valid instruments to be used for identification purposes must be devised. Therefore, efforts must be expanded to develop valid instruments for the identification of gifted students. DISCOVER could be such an instrument, if educators and researchers work together on fine-tuning its problem-solving tasks and adapting them to the particular culture where it is to be used.

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Table 1

Participants' Gender and Ethnic Distribution

	White American	African American	Hispanic	Native American	South/ Pacific Islander	Arab	Total
Males	75	74	55	46	57	154	461
Female	63	57	38	75	63	184	480
Total	138	131	93	121	120	338	941

Table 2

Participants' Mean Ratings and Standard Deviations in each DISCOVER Activity across Ethnicities

	Spatial	Analytical	Math	Oral	Written
White Americans					
Mean	2.80	2.74	2.87*	2.81	2.80
SD	.81	.89	.96	.99	1.00
African Americans					
Mean	2.66	2.33	2.74	2.69	2.72
SD	.81	.88	1.01	.79	.82
Hispanics					
Mean	2.74	2.77	2.81	2.59	2.60
SD	.85	.90	.88	.92	.94
Native Americans					
Mean	2.98**	2.71	2.68	2.84	2.76
SD	1.00	.90	1.03	.98	.96
South Pacific/ Pacific Islanders					
Mean	2.72	2.75	2.70	3.00**	2.85
SD	1.00	1.00	.89	.88	.87
Arabs					
Mean	2.69	2.54	2.69	2.78	2.72
SD	1.01	1.03	.94	1.02	.91

Note.*$p < 0.05$ **$p < 0.01$

Table 3

Gifted Participants by Ethnicity and Gender

	N	Gifted	Gifted		
		%	*n*	Boys	Girls
White Americans	138	24.6	34	15	19
African Americans	131	14.5	19	9	10
Hispanics	93	21.5	20	11	9
Native Americans	121	25.6	31	19	12
South/Pacific Islanders	120	37.5	45	19	26
Arabs	338	20.1	68	28	40
Total	941	23.0	217	101	116