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ABSTRACT

"The Multiple Intelligences Developmental Assessment Scales" (MIDAS) is a self- (or other-) completed instrument which is based upon the theory of multiple intelligences. The validity, reliability, and utility data regarding the MIDAS are reported here. The measure consists of 7 main scales and 24 subscales which summarize a person's intellectual disposition. It is appropriate for adolescents and adults and may be group administered via self-completion, or administered individually as a structured interview. The questions inquire about activities of everyday life that require cognitive ability, involvement, and judgment. This paper reviews the test's applications, its development, its reliability and validity, and its applicability in career exploration. Next, a study that involved 98 college students who were enrolled in career exploration classes is described. Results show that a strong majority of the students reported that the MIDAS Profile was beneficial and almost three-fourths of the students reported that they learned new information about their skills and abilities from the Profile. It is reported that the MIDAS provides information that is useful for increasing self-awareness especially regarding skills and abilities. The MIDAS possessed adequate reliability and validity as a self-report measure of a person's multiple intelligences disposition. Contains 16 references, a description of multiple intelligence scales, and 17 tables. (RJM)

Reliability, Validity and Utility of a Multiple Intelligences Assessment for Career Planning

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This paper describes validity, reliability and utility data regarding *The Multiple Intelligences Developmental Assessment Scales* (MIDAS). The MIDAS is a self (or other) completed instrument based upon the theory of multiple intelligences. It consists of seven main scales and 24 subscales to provide a descriptive summary of a person's intellectual disposition. The MIDAS has been included in the curriculum of a college career exploration class for 4 years and has been found to to increase students self awareness to assist in career decision making and major section.

Reliability, Validity and Utility of a Multiple Intelligences Assessment or Career Planning

The *Multiple Intelligence Developmental Assessment Scales (MIDAS)* are designed to provide an objective measure of the multiple intelligences as reported by the person or by a knowledgeable informant. The questionnaire is based upon the theory of multiple intelligences as described by Howard Gardner in *Frames of Mind* (1983, 1993). Intelligence as defined by Gardner and operationalized in the MIDAS is *"..the ability to solve a problem or create a product that is valued within one or more cultures"* (Preface). A MIDAS Profile provides information regarding a person's intellectual disposition in each of the seven areas identified by Gardner: Linguistic, Logical-mathematical, Spatial, Musical, Kinesthetic, Interpersonal and Intrapersonal. The MIDAS provides a reasonable estimate of the person's general ability in each of these seven main areas as well as descriptive information for 25 domains; for example, Instrumental and Vocal skill for Musical.

GENERAL DESCRIPTION

The MIDAS is a 106-item self (or other) report that describes a person's intellectual disposition in qualitative as well as quantitative terms. The questionnaire is appropriate for adolescents and adults and may be group administered via self-completion or individually as a structured interview. The questions inquire about activities of everyday life that require cognitive ability, involvement and judgment. The children's (K - 8th grade) version is also available.

The items emphasize observable activity in order to minimize vagueness, the influence of guess work, and mere opinion. A majority of items (57) inquire about the person's level of skill or performance of a specific activity. Fewer items (38) ask the respondent to assess the frequency or duration of time the person participates in a particular activity. The smallest group of items (11) inquire about the person's displayed enthusiasm. Each item uses a five-point Likert scale that permits a range of responses i.e. All the Time or Excellent (4) to Never or Very Little (0). Response anchors are individually tailored to match each questions' specific content. Respondents are not forced to provide generalized responses or answer beyond their level of actual knowledge because a zero category is included for every item for when the respondent "Does not know" or the item "Does not apply". Descriptions of the MIDAS scales and subscales are included in Appendix #1.

Interpretative Packet

The Interpretative Packet varies according to the needs of the user. Information is available for educational, career and counseling uses. A sample of an educational packet used at the college level includes: a: *Cover Letter* that introduces the student to MI theory, nature of the MIDAS Profile, and the four steps to creating the Brief Learning Summary; a *Brief Learning Summary* blank; *Descriptions* of the main and subscales; a listing of suggested *Study Strategies* for each intelligence as well as strategies for selecting a *College Major* and *Activities and Occupations Associated with the Multiple Intelligences.* Additional information is available regarding mean MIDAS scores for a representative sample of occupational groups.

APPLICATIONS

Education, Career Counseling, Clinical and Neuropsychology

The MIDAS is being used in a number of different educational, counseling and rehabilitative settings. It is designed to be user friendly and able to be adapted to meet the particular needs of many situations where a broad and descriptive assessment of a person's intellectual disposition would be beneficial. Two characteristics of a multiple intelligence assessment are 1) the results are easily understood by the person because the areas assessed have everyday, common-sense meanings, and 2) the results may readily be translated into predictions regarding potential success in various educational and vocational pursuits. For example, the Working with Objects and Working with People subscales provide information that is directly pertinent to vocational planning.

INSTRUMENT DEVELOPMENT

Three Phases of Development

Three phases of research have been devoted to developing the MIDAS as a practical method of assessment that possesses essential reliability and validity. This process has included item construction, scale composition and subscale creation. The approach used has been a combination of rational and empirical methods of test construction using the theory of multiple intelligences as a firm basis to guide the interpretation of empirical results. Phase 1 primarily involved a factor

analysis with 349 participants. Phase 2 was a field testing of the questionnaire involving in-depth interviews with a small sample of adult volunteers with a less than a high school education. The focus of Phase 3 examined inter-rater reliability by comparing the agreement rates between 3 different raters and subscale development was also undertaken during this study.

Reliability and Validity

The reliability for the MIDAS has been examined in terms of internal item consistency, temporal stability, inter-rater agreement and cultural bias.

Internal Consistency

Four studies have examined the internal consistency of the items within each scale (see Appendix #2). The challenge of scale development is create item sets that tap the necessary variety of behaviors to retain validity while focusing sufficiently close to a common theme. The mean Alpha coefficients for the seven scales range from .76 for Kinesthetic to .87 for three other scales with a grand mean of .85 for all seven scales. Kinesthetic is the only scale where the reliability is below the desired level of .80 and this is most likely due to the nature of the item set which is split between large and fine motor and expressive movements. The three research scales also have displayed acceptable levels of consistency with an average of .83.

Temporal Stability

Two studies were conducted to determine if respondents change their ratings during a second completion of the questionnaire. Twenty subjects were asked to complete the questionnaire a second time one week later. Test-retest results found that ratings agreed within one category for nearly 90% of the items. During the inter-rater study 32 participants completed the questionnaire 8 - 10 weeks later. Test - retest correlations ranged from .69 to .86 with an average of .81 indicating adequate stability in raters' responses during the second completion. A third and larger test-retest study involving 104 college students found correlations ranging from .76 to .92 after a one week interval (see Appendix #3).

Inter-rater Reliability

Two studies of agreement between raters were conducted in order to estimate the reliability of an informant's responses as well as to obtain indications of construct validity. It was reasoned that if two or more raters were able to agree within an acceptable margin of error then the MIDAS was more likely than not describing the designated construct. Thirty participants recruited a second informant to complete the questionnaire on the same target person. Only five items had less than 65% rate of agreement between informants and these questions were slated for removal or revision.

A second, more comprehensive study examined the rate of agreement between self-completion and two informants designated as Primary and Secondary (see Appendix 4). Each participant was asked to complete the questionnaire on him/herself and to select two people who knew him or her well to complete it also. A total of 212 people completed the questionnaire on 74 adult participants. The pairwise agreement rate for individual items was found to be in the 75% to 85% range. Correlations between scale totals ranged from .47 to .67. Scale total scores were categorized either Very High, High, Moderate, Low, Very Low. These categories were based on mean scores and standard deviations. The percent of categorical agreement rate plus or minus one category was 80% on average with a 40% rate of exact agreement. Raters were able to agree within 10 scale points about 65% of the time.

Cultural Bias

One hundred and nineteen college students taking classes in a university based Pan-African Studies Program voluntarily completed the MIDAS. Of this group, 49% were African-American and 42% were Caucasian. The mean MIDAS scores for nine of the ten main and research scales were not statistically different and varied by only a few percentage points in either direction (see Appendix #5). The only observed difference was for the Spatial scale where Caucasian students mean score was 51% while African-American students scored 45%. Item analysis revealed that only 9 of the 106 items were answered significantly different at the .05 level for the two groups. Of these 9 questions, five (many from the Spatial scale) were answered consistently higher by Caucasian students while the other four were rated higher by African-Americans. These data indicate that the MIDAS can be reliable for both African-American and Caucasian students. Further research is recommended for a non-college population and other cultural groups.

Validity

The validity of the MIDAS scales was examined during six studies. The results of these investigations are briefly summarized in terms of content validity, construct validity, concurrent validity, predictive validity and contrasted criterion groups.

Construct Validity

Construct validity is of central concern for an assessment of intelligence and is obtained through the accumulation of evidence from diverse sources. An initial research question was to determine if the MIDAS was able to distinguish seven distinct scales or constructs as described by the theory of multiple intelligences. The initial exploratory factor analysis involved 349 participants and indicated that the questionnaire was able to distinguish the seven hypothetical constructs plus an eighth (Appendix #6). Items that were designed to assess specific intellectual abilities loaded on the factor for which they were intended or co-loaded appropriately on several factors.

Discriminant and convergent validity were then investigated during the Inter-rater reliability study described above. The results indicate that the MIDAS scales possess adequate ability to discriminant for their designated areas (Appendix #7). While these results are not perfect they provide evidence that the questionnaire obtains a "reasonable estimate" of a person's multiple intelligence profile. Further scale refinement and development was undertaken following this investigation to improve item and scale discrimination.

Additional evidence for construct validity was obtained during content and cluster analyses as well as contrasted groups. During scale development, expert reviewers (including Howard Gardner) provided contributions to the content and wording of questions as well as scale composition. As described above, when the theoretically derived subscales were compared to the results of a statistical cluster analysis, the resulting concordance rate was high. In the contrasted groups study described below, the pattern of expected scores between selected and defined student groups was observed.

Concurrent Validity

The next research effort investigated external validity in terms of how well the MIDAS scales correlated with objective tests of similar or related constructs.

The goal of this study was to examine how well the MI scales correlated with selected, matched and standardized aptitude, cognitive and achievement tests. An interest inventory was also included in this battery for three reasons. 1) MI theory defines intelligence in everyday behavioral terms that often reflect a person's interests and involvements. 2) Standard tests are usually unable to account for the productive and creative aspects of intelligence. 3) Eleven MIDAS questions ask about expressed enthusiasm for a particular activity.

Fifty-six participations were recruited by way of fliers distributed in public places, a college campus, a rehabilitation hospital, a sheltered workshop and local adult education classes. Participants completed the MI questionnaire along with the interest inventory at home prior to testing. It was expected that correlations between the MI scales and test results would be quite modest (e.g. .40 to .50) given Gardner's real world and broad conceptualization of each intelligence and the practice of psychometric testing which strives for controlled precision. In other words, it was expected that the MIDAS scales would be moderately related to but not identical with the results of the testing.

The resulting correlational values and their pattern between MI main scales and cognitive, achievement and aptitude tests met or exceeded research expectations (see Appendix #8). The only exception was between the Interpersonal scale and the Social Translations test which is explainable in terms of the test's limitations and the complexity of Interpersonal intelligence. Most main scale scores correlate in the high .5 level with a range of .2 to .60. Of particular note is the .60 correlation with the Linguistic scale when the Vocabulary and Expressional Fluency scores are combined. Similarly, when the Abstraction and WRAT Math scores were combined they correlate at .58 with the Logical-mathematical main scale and at .65 with the Intrapersonal: Calculations subscale.

Correlational values and their pattern between selected MI *subscales* and appropriate cognitive tests also generally meet expectations ranging from .35 to .65 with most values above .48. For example, .60 between School Math and the WRAT Math test and .48 between Expressive Sensitivity and the Vocabulary test. The MI Written subscale also correlates at .59 with the

Vocabulary test.

MIDAS scales difficult to equate with standard cognitive or achievement tests were compared to vocational interest scales and were found to meet expectations. These comparisons are also useful for accounting for the divergent or creative aspects of each intelligence that standardized tests are not equipped to assess. For example, the Musical scale correlates at .52 with the Musical interest inventory and the Leadership scale correlates at .62 with the Social Occupational Theme. On the whole, correlations with the interest scales are less (most in the low .4 range) than with cognitive tests where most are in the high .5 range. These results indicate that while the MIDAS describes a person's areas of enthusiasm and involvement it more reliably assesses level of performance.

Intrapersonal Scale

The validity of the Intrapersonal main scale was examined by comparing two contrasted groups. It was found that the participants from a Sheltered Workshop (with various psychiatric diagnoses) obtained a mean Intrapersonal score of 41% while the graduate level counselors mean score was 56%. The difference between these two means is significant at the $p<.05$ level and conforms to expectations. This result was further tested when it was found that Counselors are better at self estimating their skills as compared to test results than were the Workshop participants. Thus, it was concluded that the difference between their mean Intrapersonal scores was both statistically and practically significant, indicating validity of the scale.

Predictive Validity

The next study investigated how well college students' self report would compare to the "expert ratings" provided by their instructors in order to determine the external validity of the assessment.

Two hundred and twenty four students in 13 classes attending two large universities voluntarily completed the MIDAS. Participants ranged from first year students through graduate school. Intact classes were chosen where it was thought that instructors would have sufficient knowledge of each student and his/her skill level in the specified intelligence. For example, ballet classes for Kinesthetic, writing classes for Linguistic, interior design for Spatial, math classes for Logical-mathematical, music theory for Musical, counselors for Interpersonal and freshmen

orientation leaders for Leadership. After mid-semester grades were assigned, course instructors completed a specially developed rating scale to assess students' skill for the appropriate ability scale.

The result was that professors' ratings and the students' self-report MIDAS scores agreed 86% of the time within one category (see Appendix #9). This rate of agreement is 6% better than the previous multiple rater study but the 33 percent rate of exact agreement is less than 40% previously attained .

Overall, the instructors rated the students' abilities higher 48% of the time versus 33% exactly and 19% of the time lower than students' MIDAS self ratings. It is possible that the MIDAS generally underestimates the students abilities. Several alternative explanations are also possible. First, instructors may not have sufficient familiarity with students' skills to make accurate appraisals and the prevalence of "grade inflation" by college instructors is presently a well-documented phenomena. Secondly, students' lower self appraisals may be due to an overly self-critical attitude. The fact that the instructors' rating scales were not exactly equivalent to the MIDAS may account for some of these differences. For example, the MIDAS Kinesthetic scale focuses more on Athletic activities rather than dance. In spite of these confounding influences, the overall results indicate that college students' self ratings on the MIDAS are in reasonably close agreement with measurements provided by expert raters. Further research is necessary to determine if the MIDAS is too stringent in its scores or if other factors account for the discrepancy between self and instructor ratings.

Contrasted Groups

MIDAS scores for the various student groups in the above described study were then contrasted and compared to determine if the pattern of scores for well-defined ability groups met reasonable expectations (see Appendix #10). For example, it was found that dance majors scored significantly higher ($p<.05$) at a mean score of 65% on the Kinesthetic scale than students in math (43%), music (46%), writing (48%) and Leadership (43%). This same pattern holds true for the Spatial scale where interior designers and sculptors mean score was 66%. Musicians averaged at 72% on the Musical scale. Advanced math students at 65% for the Logical-mathematical scale. Conversely, developmental math students scored 36% on the Log. Math scale. Elementary

education students scored at 42% on the Musical and 63% on the Interpersonal scale. The overall magnitude of the mean MIDAS scores as well as their patterns are logically consistent with what would be expected of college students thought to be either high or low in specified skills.

A second contrasted groups study involved over 400 adults in 18 different occupational groups. The sample sizes for the groups are small so these results are preliminary and suggestive. Occupational groups were selected to match with each of seven intelligences. The results are interesting for the pattern of high and low mean scores for each scale.

Music:	Musicians: 73	Firemen: 34
Kinesthetic:	Dancers: 67	Writers: 33
Math/Logic:	Engineers: 68	Ele. Teachers: 44
Spatial:	Artists: 68	Writers: 41
Linguistic:	Writers: 72	Skilled Trades: 43
Interpersonal:	Psychologists: 68	Engineers: 45
Intrapersonal:	Pilots: 68	Writers: 49
Leadership:	Supervisors:66	Skilled Trades: 43
General Logic:	Pilots: 66	Musicians: 52
Innovation:	Dancers: 57	Police: 44

Discussion

The results of these six studies indicate that the MIDAS has adequate reliability and sufficient construct and criterion validity to conclude that when validity indicators are taken into consideration the MIDAS provides a "reasonable estimate" of the person's intellectual disposition in the seven designated areas. A larger scale factor analysis is recommended as is increasing the range and sample size of the occupational groups study.

Career Exploration

The primary purpose of this study was to determine if the MIDAS self assessment could help undergraduate students participating in a Career Exploration class to select an academic major, clarify career plans and contribute to personal understanding. A second goal was to begin to describe the relationship of Intrapersonal intelligence to personal development and career planning.

According to Gardner's theory self understanding is a key to personal success and achievement. An important aspect of personal understanding and vocational success is having realistic knowledge of one's skills and abilities. It was reasoned that the addition of the MIDAS Profile coupled with instruction in MI theory would increase students' self awareness and thus facilitate career planning. It was also expected that students with low Intrapersonal awareness would show generally lower MI scores with little variability in scores, i.e., low and flat profiles due to a lack of development and experience. The Intrapersonal scale was expected to show the greatest amount of increase at the conclusion of the course while remaining scales would hold steady.

Method

Subjects

Ninety eight students participating in two sections of the Career Exploration class at a large, mid-western, state university were the subjects for this study. The Career Exploration class is provided for students who are undecided about their choice of a major and are confused about career direction and / or desire to improve job seeking skills. Enrollment in the class is competitive and students actively participate.

Class composition was 33% Freshman, 45% Sophomores, 15% Juniors and 3% Seniors. Students were evenly divided between males and females. Sixty percent of the class reported a grade point average of B minus or less while 34% reported an average between B and B plus.

Procedure

Students completed the MIDAS during the first week of classes in addition to a number of other self administered inventories including: the Self Directed Search, a skills inventory, a values clarification questionnaire, and the Career Exploration Student Opinion Survey. Students were then provided with a copy of their MI Profile scores, written interpretive materials and a 45 minute presentation by the researcher on MI theory and interpretation. This information was then incorporated with the other course materials and regular curriculum by the class instructor.

At the end of the semester the Student Opinion Survey was administered with five questions regarding the value and usefulness of the MIDAS Profile, interpretative materials and presentation.

Results

At the conclusion of the course there was a 56% increase in agreement with the statement "I'm well on my way to choosing a career" and a 39% increase agreeing that "I know what decisions I must make now so I can find a career for me". Fifty-eight percent of the students reported that they were less confused regarding the choice of an academic major while 56% reported that the course helped to improve their job seeking skills. Twenty-four percent reported increased self confidence.

In order to determine if students found their multiple intelligence assessment to be helpful they were asked to respond to five inquiries at the end of the semester and the results are summarized below.

Student Ratings on the Contributions of the MIDAS Assessment

	Agree	Unsure
1: The MIDAS Profile matched my expectations.	73%	21%
2: I learned new facts about my skills and abilities from the MIDAS	72%	24%
3: MIDAS Profile answered questions about my skills / abilities.	71%	24%
4: MIDAS Profile gave useful information to help career planning.	73%	20%
5: The MIDAS presentation & written information were helpful.	76%	19%

Intrapersonal Awareness:

A second goal of this study was to explore the relationship of Intrapersonal intelligence to personal development and career planning. Self awareness is thought to be a crucial element in effective learning, personal satisfaction and vocational success (Gardner, 1993). Self awareness is assessed by the MIDAS in a global way via the Intrapersonal scale but more specifically by the Intrapersonal subscale, Personal Knowledge.

Two questions regarding self awareness were explored. It was expected that students' scores on the Personal Knowledge subscale of the Intrapersonal scale would increase as a result of class participation. The overall Intrapersonal score, however, should not change significantly

since MIDAS main scales are thought to be relatively stable traits or behavioral patterns. Second, it was hypothesized that students with low Personal Knowledge scores would have distinctive MI Profiles as compared to students who judged themselves to be high in self knowledge.

The result was that the mean Intrapersonal scale score did not change significantly from beginning to end the semester (50% to 51%). However, the Personal Knowledge subscale did show a significant ($p<.05$) change from 53% to 56% with a greater variability $r=.51$ than any other subscale. This variability suggests that while many students' scores went up a number of others went down.

The next step was to compare students who rated themselves either low or high in Personal Knowledge. Exploratory statistical analysis revealed that students who scored themselves low on the Personal Knowledge subscale (<39%) as a group had generally lower and flatter MI Profiles. Conversely, students high in Personal Knowledge had generally higher MI mean scores and there is greater variability in their Profiles with specific areas of developed ability (see insert).

Summary

Students in the Career Exploration class have a relatively low grade point average (60% B minus and less) and several of their key MIDAS scales are low as compared to similar college students. Most notably, lower scores are evidenced for the two academic areas Logical-Mathematical (43% vs 49%) and Linguistic (49% vs 59%). Low scores are also reported for Musical (40% vs 48%) and Intrapersonal (50% vs 54%).

Students low in Personal Knowledge report a lack of overall skill development without a specific area of developed ability. This lack of overall personal development appears to be a significant contributing factor to vocational confusion and academic indecision.

At the conclusion of the class over half of students report being clearer on the choice of a college major and say they feel better prepared to actually search for a job. More than a third of the students indicate they are less confused about choosing a career while nearly a fourth state that they have more self confidence.

A strong majority of the students reported that the MIDAS Profile was beneficial. Nearly three-fourths of the students reported that they learned new information about their skills and abilities from MIDAS Profile Report. A comparable number of students also indicated that the multiple intelligence interpretative presentation and materials were helpful in career planning.

Conclusions

The MIDAS has been found to possess adequate reliability and validity as a self report measure of a person's multiple intelligences disposition. College students report that they find the Career Exploration class beneficial for clarifying career goals and selecting an academic major. They also report that the MIDAS Profile Report provides them with new information that is useful for increasing self awareness especially regarding skills and abilities. Consequently, students are better able to make educational choices and career plans with enhanced self awareness. A significant number of students, however, remain at the conclusion of the course perplexed regarding these important personal decisions. These students appear to be those who are not merely confused about a career direction but who also have undeveloped skills and may have a general lack of intellectual and personal maturity as is indicated by their low and flat MI Profiles and low Intrapersonal scores. Further research should help to describe discrete groups of students according to degree of personal confusion, Intrapersonal awareness and skill development. This information could then be used to create interpretative discussions, strategies and materials following the MIDAS assessment that focuses each student's thinking on the areas most in need of support and development.

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APPENDIX

Multiple Intelligence Scales

Musical:

...sensitivity to pitch, melody, rhythm, timbre and the emotional aspects of sounds...

>Vocal Ability: - a good voice for singing in tune and in harmony

>Instrumental Skill: -played an instrument as a teenager or adult

>Composer: -made up songs or poetry and had tunes on her mind

>Appreciation: -interest in music such as rock, classical, country, etc.

Bodily-Kinesthetic:

..the ability to use one's body in highly differentiated and skilled ways, for expressive as well as goal-directed purposes....to work skillfully with objects, both those that involve fine motor movements of one's fingers and hands and those that exploit gross motor movements...

>Athletics -involvement and skill in sports or other physical activities

>Dexterity: Working with Hands & Expressive Movement: -able to use hands skillfully working with objects

Logical-Mathematical:

..to appreciate the actions that one can perform upon objects, the relations that obtain among those actions, the statements (or propositions) that one can make about actual potential actions, and the relationships among those statements....

>School Math:-did well in studying math at school

>Everyday Math: -uses math effectively in everyday life

>Everyday Problem Solving (Logical Reasoning): able to use logical reasoning to solve everyday problems, curiosity

>Strategy Games: -good at games of skill & strategy

>Science: involved in science, collected things and may have studied nature and scientific-type inquiry

Spatial:

..to perceive the visual world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's visual experience, even in the absence of relevant physical stimuli....

>Space Awareness: solve problems of spatial orientation and moving objects through space such as driving a car & direction

>Working With Objects:building, arranging, decorating, or fixing things, involves eye-hand integration

>Artistic Design:-jobs or projects where aesthetic or design are important

Linguistic:

...sensitivity to the meaning of words, the order among words, sounds, rhythms, inflections, different functions of language, phonology, syntax, semantics and pragmatic...

>Expressive Sensitivity:-paid attention to and used language for communication and expression

>Rhetorical Skill:-to use language effectively for interpersonal negotiation,persuasion-at school, work, home or among friends

>Written-Academic Ability:-to use words well in writing to create reports, letters, stories, verbal memory, reading and writing

Interpersonal:

...the ability to know other people- to recognize their faces, their voices, and their persons; to react appropriately to them...to read the signals of other people and understand their motives, feelings, intentions.....

>Social Sensitivity:-aware of and concerned about others, socially astute

>Social Persuasion:-able to influence others

>Interpersonal Work:-interest and skill for people oriented work

Intrapersonal:

....our sensitivity to our own feelings, our own wants and fears, our won personal histories...awareness of our own strengths and weaknesses, plans and goals....

>Personal Knowledge / Efficacy:-awareness of one's self and to achieve personal goals, at school or vocational satisfaction

>Calculations:meta-cognition "thinking about thinking" involving numerical operations

>Spatial Problem Solving:self awareness to problem-solve while moving self or objects through space, use of mental imagery

Naturalist:

....awareness of the natural world, understanding and working with plants and animals, scientific studies and activities....

>Understanding Animals:-awareness of the characteristics and behavior of various animals and their needs

>Working with Plants: ability to understand, care for and grow plants

RESEARCH SCALES

Leadership: *...ability to use language effectively to organize, and solve interpersonal problems & achieve goals*

Innovation:... *originality, or novelty--the skill of fashioning an unfamiliar yet worthy product within a particular realm...*

General Logic: *...the ability to deal with problems in an intuitive, rapid, and perhaps unexpectedly accurate manner...*

ring together a wide amount of information and to make it part of a general and effective plan of action.

APPENDIX #2

Internal Item Reliabilities in Five Diverse Samples

	Samples				
Scale	#1	#2	#3	#4	mean
Musical	.80	.85	.85	.88	.85
Kinesthetic	.86	.75	.68	.76	.76
Logical Math	.88	.89	.86	.85	.87
Spatial	.83	.80	.87	.86	.84
Linguistic	.89	.86	.86	.86	.87
Interpersonal	.93	.88	.87	.81	.87
Intrapersonal	.93	.83	.87	.81	.86
				mean	.85
Research Scales					
Leadership.		.86	.85	.81	.84
General Logic.		.	.83	.79	.81
Innovation		.	.83	.81	.82

Note. All r Alpha Cronbach
Samples:
Study #1: (n=349), reported in Shearer, 1991.
Study #2: (n=194), reported in Shearer, 1991
Study #3: (n=56) unpublished
Study #4: (n=224) unpublished

APPENDIX #3

Test - Retest Correlations

Musical	.92
Kinesthetic	.86
Logical	.81
Spatial	.83
Linguistic	.87
Interpersonal	.88
Intrapersonal	.76

Note. N=104, one week interval

APPENDIX #4

Agreement Rate Between Two Raters

Scale	Exact	+1	Kappa	T-value
Musical:	49%	86%	.36	5.83***
Kinesth:	39	77	.24	3.94***
Log-Mat:	42	77	.28	4.60***
Spatial:	36	77	.21	3.35***
Linguis:	35	71	.18	2.95**
Interpe:	35	82	.19	3.03**
Intrape:	41	80	.26	4.25***
Leaders:	41	88	.26	4.24***
mean =	40%	80%		

Note. ** p< .01, two-tail test; *** p< .001, two-tail test

APPENDIX #5

Percent Mean Scale Score Comparisons Between Student Groups

Scale	ALL	PA	AA	C
Music	52%	48%	50%	47%
Kinesthetic	48	48	48	47
Logical Math	49	48	48	48
Spatial	52	48	45	51*
Linguistic	59	56	56	57
Interpersonal	61	60	60	61
Intrapersonal	55	54	54	52
Leadership	59	57	58	56
General Logic	55	54	56	53
Innovation	52	47	45	49

Note. *= p<.05, t test
ALL= Study 4 (n=224)
PA= Pan-African Studies students only (n=119)
AA= African-American students only (n=58)
C= Caucasian students only (n=50)

Table 5

Factor structure matrix for 8-factor solution using PROMAX rotation

	Interpersonal	Math	Kinesthetic	Intra-personal	Linguistic	Spatial	Music	Leadership
MAPIT67	0.65142							
MAPIT57	0.67565							0.37433
MAPIT64	0.69406							0.43781
MAPIT66	0.63466							0.30566
MAPIT94	0.63966			0.39087				
MAPIT70	0.63052							
MAPIT65	0.54675							0.47627
MAPIT61	0.57132							0.65255
MAPIT63	0.51257							0.31881
MAPIT103	0.56937			0.51336				
MAPIT66	0.59747			0.42166	0.31743			
MAPIT111	0.50271			0.32616	0.42345			
MAPIT56	0.55206			0.34405	0.30194			0.47660
MAPIT110	0.41206			0.29946				
MAPIT91	0.51390				0.30057			0.40328
MAPIT55	0.50571		0.36667		0.48767			
MAPIT105	0.43013			0.42555		0.31927		
MAPIT46	0.39222				0.31196		0.29676	0.36323
MAPIT69	0.40682			0.30932	0.35466			
MAPIT25		0.71536						
MAPIT24		0.69089						
MAPIT28		0.76557		0.33642				
MAPIT27		0.74622		0.35256				
MAPIT37		0.65416						
MAPIT32		0.69397		0.42665				
MAPIT36		0.70229		0.37811				
MAPIT33		0.56300				0.31801		
MAPIT34		0.55016						
MAPIT30		0.50626						
MAPIT51		0.46526						0.30020
MAPIT76		0.51236				0.47428		
MAPIT31		0.49344						
MAPIT14			0.83161					
MAPIT11			0.83949					
MAPIT15			0.79919					
MAPIT16			0.75449					
MAPIT12			0.65150					
MAPIT13			0.61196					
MAPIT58	0.33936		0.63664	0.38404				
MAPIT20			0.51236	0.36364				
MAPIT22	0.36364		0.51192					
MAPIT102	0.39431	0.30010		0.75124	0.30754			
MAPIT101				0.63505				
MAPIT100				0.65029		0.33958		
MAPIT104	0.37361			0.65637				
MAPIT95	0.39378			0.57079				
MAPIT67				0.52794		0.51366		
MAPIT99	0.47699	0.32431		0.63146				0.36720
MAPIT96	0.32912			0.57369	0.36359			
MAPIT88				0.47900		0.46676		
MAPIT29		0.37642		0.45428				
MAPIT47					0.67067			0.32302
MAPIT52					0.64699			
MAPIT7					0.57390		0.37757	
MAPIT71					0.53623			
MAPIT45	0.40842				0.62170			0.46446
MAPIT6					0.49361		0.34208	
MAPIT44					0.44925		0.30698	0.35869
MAPIT50				0.29746	0.44210			
MAPIT93				0.34521	0.41290			
MAPIT35						0.73032		
MAPIT78						0.61970		
MAPIT36		0.35674		0.31284		0.63360		
MAPIT89						0.52686		
MAPIT85		0.33378				0.54028		
MAPIT79				0.41629		0.54701		
MAPIT86						0.42277		0.35778
MAPIT82	0.33461					0.40611		0.38903
MAPIT98	0.34918			0.46494		0.39676		
MAPIT26		0.36294		0.33293				
MAPIT2							0.82318	
MAPIT4							0.76414	
MAPIT1							0.73405	
MAPIT3							0.74130	
MAPIT5					0.44800		0.52853	
MAPIT10	0.38624				0.36577		0.40168	
MAPIT59	0.33245		0.30037		0.30221			0.64692
MAPIT53					0.39724			0.62254
MAPIT62	0.38286							0.59013
MAPIT60	0.30767			0.34802	0.33961			0.59463
MAPIT48		0.35932			0.54248			0.59313
MAPIT92	0.39004			0.30725				0.46023
MAPIT90	0.41556			0.46241				0.46230
MAPIT108	0.42639			0.43519				0.43358

NOTE: VALUES LESS THAN 0.295 HAVE BEEN PRINTED AS .

APPENDIX #7

Multitrait / Multimethod Matrix (N=68)

Self Ratings Compared to Combined Scores of Primary and Secondary Informants

	M0	K0	L0	S0	Li0	Ie0	Ia0	D0
Self								
Mus0	(87)							
Kin0	44	(75)						
Log0	12	05	(80)					
Spa0	33	36	47	(66)				
Lin0	55	60	22	43	(88)			
Ite0	31	62	09	29	80	(86)		
Ita0	25	44	53	58	66	70	(73)	
LDr0	37	57	19	35	86	93	72	(86)

Combined

	M0	K0	L0	S0	Li0	Ie0	Ia0	D0	*M3*	*K3*	*L3*	*S3*	*Li3*	*Ie3*	*Ia3*	*D3*
Mus3	80	42	07	27	41	26	13	31	(85)							
Kin3	23	68	08	32	37	46	38	43	35	(75)						
Log3	13	00	65	43	17	01	37	07	24	00	(89)					
Spa3	27	12	32	70	24	09	33	17	37	39	64	(80)				
Lin3	48	31	09	28	54	45	37	49	51	56	55	59	(86)			
Ite3	29	37	07	23	47	64	58	59	38	49	23	61	33	(88)		
Ita3	19	17	41	40	33	35	64	34	28	52	71	60	67	73	(83)	
Ldr3	36	32	12	26	53	63	58	67	41	51	37	40	74	90	76	(81)

Coef. Alpha in ( )

Legend:

0= self evaluation
3= primary & secondary informants' scores combined
M & Mus = Musical
K & Kin = Kinesthetic
L & Log = Logical / mathematical
S & Spa = Spatial
Li & Lin = Linguistic
Ie & Ite = Interpersonal
Ia & Ita = Intrapersonal
D & Ldr = Leadership

APPENDIX #8

Correlations Between MIDAS Main Scales and Criterion Measures

Main Scale	Criterion Measures*
Linguistic	.56 Vocabulary & .48 Expressive Fluency & .60 combined.
Logical Math	.51 Abstraction & .55 Math & .58 combined
Spatial	.42 Spatial Relations
Interpersonal	.20 Social Translations*
Linguistic & Log / Math	.59 I.Q. estimate

Note. All correlations are significant at $p < .001$, except * $p < .13$. two tailed tests

Correlations Between MIDAS Subscales and Criterion Measures

Subscale	Criterion Measure*
School Math	.60 Math
Everyday Math	.53 Math
Spatial Awareness	.35 Spatial Relations
Ling.Expressive Sensitivity	.48 Vocabulary & .45 Expressional Fluency
Ling.Written	.59 Vocabulary
Ling. Rhetorical	.45 Expressional Fluency & .44 Vocabulary
Ldr. Communication	.48 Vocabulary
Intra Calculations	.62 Math & .65 Math / Abstraction combined.
Intra Spatial Prob. Solving	.48 Spatial Relations

Note. All correlations are significant at $p < .01$. two tailed tests
*Criterion measures are
Vocabulary & Abstraction tests from the Shipley Institute of Living Scales
Expression Fluency from J.P. Guilford
Math from Wide Range Achievement Test
Spatial Relations from Career Ability and Placement Survey
Social Translations from J.P. Guilford's tests of Social Intelligence

APPENDIX #9

Agreement Between MIDAS Scales and Instructors' Ratings

Total N	Main Scale	Exact n	±1 Cate. n	Exact & ±1 Category. %
35	Logical Math	11	18	83%
49	Linguistic	14	22	86%
26	Intrapersonal	9	15	92%
25	Interpersonal	13	10	92%
26	Kinesthetic	3	15	69%
43	Spatial	17	19	84%
27	Musical	8	17	93%
==		==	==	==
231	Totals	75	122	mean 86%

APPENDIX #10

Student Group Comparisons on MIDAS Main Scales

Group	Kinesthetic Mean
Dance Majors	65%*
Dance Beginners	58
Interior Designers	49
Creative Writing	48
Music Theory	46
Number Theory	43
Student Leaders	43

Note. p= <.05

Group	Spatial Mean
Int. Design & Sculpt	66%*
Music Theory	50
Creative Writing	48
Student Leaders	48
All Ballet	46
Dev. Math	43

Note. p= <.05

Group	Music Mean
Music Theory	72%*
All Ballet	59
All Math	43
Elementary Teachers	42
Student Leaders	41

Note. p= <.05

Group	Logical-Math Mean
Number Theory	65%*
Ballet I	55
Musicians	49
General Public	46
Elementary Teachers	44
Dev. Math	36

Note. p= <.05

Group	Linguistic Mean
Creative Writing	62%
Student Leaders	61
Inter. Des. & Scupt	58
All Ballet	56
Music Theory	56
All Math	54
General Public	48

No significant differences

Group	Interpersonal Mean
Student Leaders	65%
Creative Writers	62
Counselors	61
All Ballet	59
Number Theory	54

No significant difference

Group	Innovation Mean
Inter. Des. & Scupt	60%*
All Writers	52
All Ballet	52
Music Theory	48
Student Leaders	47
All Math	44

Note. *p<.05

Group	Leadership Mean
Student Leaders	65%*
All Writers	60
All Ballet	58
Music Theory	58
Int. Des. & Sculpt	57
All Math	55
General Public	45

No significant differences

Note: Class Groups:
Number Theory (Seniors & Graduate students)
Creative Writing (mixed undergraduate students)
Ballet I (first year students)
Ballet III (seniors)
Developmental Math (first & second year students)
Music Theory (selected mixed students)
Interior Design I (first & second year students)
Interior Design Advanced (advanced senior students)
Developmental Reading (first & second year students)
Health Counseling (graduate students)
New Student Orientation Group Leaders (highly selected Juniors & Seniors)
Multi-Media Design (mixed art majors)
Music for Elementary Student Teachers
General Public (mixed adults from Concurrent Validity study)

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