Unmasking Students' Sense of Academic Supportiveness and Climate: Results from Field Testing the AEL MASC

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INTRODUCTION

The AEL Measure of Academic Supportiveness and Climate (AEL MASC) was developed as part of the MAACK Pilot Schools project currently underway at AEL. MAACK stands for Maximizing Achievement for African American Children in Kanawha. The AEL MASC was designed to determine students' perceptions about themselves as students and about their school experiences. The survey also examines students' perceptions of their families' awareness of and involvement in their children's school lives. All of these factors are strongly related to student performance; if students do not feel they have a supportive school environment as well as family support, they are less likely to perform well in school. Finally, the survey is designed to facilitate comparisons among the perceptions of groups of students according to their gender or ethnicity.

AEL MASC survey items were developed after a review of the literature revealed a lack of validated student surveys addressing issues of school and family support and fairness in terms of instructional opportunities and extracurricular activities for all students. In particular, the following surveys were identified and deemed to be inappropriate for this particular project:

- ★ **Gottfredson Associates (2001).** This School Diversity Inventory measures perceptions of administrative leadership in promoting a climate of respect for diversity. Although several subscales were relevant, this inventory was rejected due to associated costs for utilizing materials and scoring.

- ★ **Wayman (2002).** This survey assessed student perceptions of teacher bias in terms of Mexican American and non-Latino White students. Reliability and validity information was not provided, and the instrument did not focus on perceptions of bias toward African American students.

- ★ **Pohan and Aguilar (2001).** This survey assessed educators' beliefs about diversity in personal and professional contexts. While this instrument possessed sufficient reliability and validity, it focused exclusively on teachers' perceptions.

- ★ **Rothfarb (1992).** This survey provided baseline data on secondary students' perceptions of intercultural relations. While possessing sufficient reliability and validity, the survey was less appropriate for elementary students.

- ★ **Walberg, Anderson, and Cayne (1969).** This survey includes subscales measuring students' perceptions of diversity, environment, favoritism, and democratic climate. However, reviews suggest less than sufficient reliability.

The AEL MASC began in 2002 as a 27-item student survey (the MAACK Student Survey) developed by AEL staff providing technical assistance to schools involved in the MAACK project. After minor revisions in 2003 to improve item clarity, the instrument was pilot tested with 2,818 students (49% boys, 51% girls) in eight schools from grades 3 through 11 (four MAACK pilot schools and four comparison schools). Approximately 21% of the sample students were African American, 66% were White, and the remaining 13% were members of other racial/ethnic groups. Sixty-eight percent of the respondents were enrolled in grades 9 through 12; the remaining respondents were enrolled fairly evenly in grades 3 through 8 (approximately 7% per grade). More than half of the participants (57%) attended schools actively participating in the MAACK pilot schools project.

Results of a preliminary factor analysis of the pilot-test data revealed five subscales, which together explained approximately 51% of the variance in respondents' scores. These subscales include:

- ★ **Staff Supportiveness.** This eight-item subscale assesses the degree to which school staff know and respect students, and treat them fairly. It explains 19.3% of the variance and has a Cronbach Alpha reliability coefficient of .89.

- ★ **Family Expectations.** This five-item subscale measures the extent to which students feel their families are aware of their progress in school and expect and support their academic success. It explains 11.1% of the variance and has a Cronbach Alpha reliability coefficient of .66.

- ★ **Welcoming Environment.** This six-item subscale assesses students' perceptions of the degree to which their school climates are both intellectually and socially safe and comfortable. It explains 10.1% of the variance and has a Cronbach Alpha reliability coefficient of .79.

- ★ **School Ties.** This three-item subscale measures family presence in the school and student participation in extracurricular activities. It explains 5.4% of the variance and has a Cronbach Alpha reliability coefficient of .50.

- ★ **Student Academic Efficacy.** This two-item subscale assesses students' sense of their academic capability. It explains 5.2% of the variance and has a Cronbach Alpha reliability coefficient of .37.

In an effort to increase the less than satisfactory reliability coefficients of some subscales and to balance more evenly the number of items comprising each subscale, the instrument was again revised in 2003. Fifteen new items were added, and the instrument was formally renamed the AEL Measure of Academic Supportiveness and Climate (AEL MASC). This version of the AEL MASC was used in the data collection for the field test.

This paper provides a summary of the field test of the AEL Measure of Academic Supportiveness and Climate (AEL MASC) student instrument. Findings from the field test can be utilized in revising and fine-tuning the instrument for future administrations.

METHODS

Participants

Eight schools participating in AEL's Maximizing Achievement for African American Children in Kanawha (MAACK) County Pilot Schools project (four pilot schools and four comparison schools) were required by the district superintendent to administer the AEL MASC to all students in grades 3 through 12 in late April and early May of 2003. Included in this group were four elementary schools, two middle schools, and two high schools. Half of the schools at each level (pilot schools) were working with AEL staff to implement new instructional policies and practices designed to help narrow the achievement gaps for minority and low-income students. Table 1 provides the numbers of students enrolled in grades 3 through 12 and surveys delivered to each school. Extra surveys were provided to each school to compensate for possible inaccuracies in the most recent enrollment data available.

Table 1: Enrollment and Number of Surveys Distributed to Participating Schools

School	Number of Students Enrolled	Number of Surveys Distributed
Comparison Elementary School A	179*	150
Comparison Elementary School B	366	420
Comparison Middle School	471	525
Comparison High School	1,100	1,260
Pilot Elementary School A	215*	210
Pilot Elementary School B	264*	240
Pilot Middle School	692	805
Pilot High School	1,454	1,680
Total	*4,741*	*5,290*

* Surveys were not administered to students below grade three, hence the number of students enrolled is larger than the number of surveys distributed.

As shown in Table 2, the overall number of surveys administered in 2003 was much lower than the number of students enrolled in grades 3 through 12 due to survey administration difficulties at each school (described elsewhere); further, a significant proportion of the returned surveys were incomplete. However, the overall return rate in 2003 (56.42%) was very similar to that obtained in the same schools in 2002 (54.61%), and all but one school returned more surveys in 2003 than in 2002.

For test-retest purposes, the survey was administered a second time in three of the eight schools. Although all of the comparison schools in the MAACK pilot schools project were contacted and offered a monetary bonus for participating in the test-retest portion of the field test, only one elementary and the middle school agreed to take part. Subsequently, the pilot high school was contacted with the same offer and agreed to take part.

Table 2: Number of Complete, Incomplete, and Total Surveys Administered

School	Number of Surveys Administered in 2003		Total Number of Surveys Administered	
	Complete	Incomplete	2003	2002
Comparison Elementary School A	83	0	83	77
Comparison Elementary School B	297	9	306	284
Comparison Middle School	317	17	334	237
Comparison High School	724	41	765	577
Pilot Elementary School A	74	2	76	69
Pilot Elementary School B	124	4	128	109
Pilot Middle School	397	24	421	369
Pilot High School	448	114	562*	867
Total	*2,464*	*211*	*2,675*	*2,589*

*Staff at Pilot High School made the decision not to survey students in the 12th grade.

Students were not asked to provide an identification number on the AEL MASC. Instead, AEL staff assigned an identification number to each survey after its completion and return. These identification numbers consisted of 14 numbers and were developed by using "39" to identify the county (the state-level code for Kanawha County); a four-digit number to identify the school based on the first letter of each word in the school name (i.e., Pilot High School = 0747—first a zero to indicate the school name contains only three words, followed by numbers matching the letters on a telephone number pad); a four-digit number for the month and year in which the survey was administered (i.e., April 2003 = 0403); and a four-digit number providing a consecutive count of returned surveys (i.e., 0001, 0002, etc.). Each of the completed and returned test-retest surveys packaged together was given the same identification number, regardless of whether or not the demographic information matched. (The "Procedures" section explains how each student's test and retest were matched without violating confidentiality.)

As shown in Table 3, the overall return rate (30.03%) in this portion of the field test was much lower than the overall survey return rates in 2002 and 2003. In addition, approximately 15% of the survey pairs returned were incomplete.

Table 3: Number of Complete and Incomplete Pairs of Surveys for Each School Participating in the Test-Retest Administration

School	Complete	Incomplete	Total
Comparison Elementary School B	40*	6	46
Comparison Middle School	278	16	294
Pilot High School	348	98	446
Total	*666*	*120*	*786*

*Due to error in administering the surveys at this school, only 46 paired surveys were returned.

During the inspection of the test-retest surveys for completion, staff noticed that the demographic data on some of the physically-paired surveys did not match. For instance, for one pair, demographics on the first administration indicate that the respondent was a 9th-grade White girl enrolled at the school for six months to one school year, but on the second survey, the demographics indicate that the respondent was an 11th-grade Hispanic boy enrolled at the school for more than one year. Staff subsequently examined the handwriting on the surveys. Physical pairs with discrepant demographic data were sorted into those with similar handwriting and those with either dissimilar handwriting or a blank demographic section. Surveys with similar handwriting were treated as genuine pairs, but only the demographics on the first administration were used to describe the respondent. A variable indicating these changes was added to the database for use in subsequent analyses. In cases in which survey handwriting could not be matched, the data were not included in the test-retest analyses, although data from the first survey in an unmatched pair were used to establish validity. Table 4 provides a breakdown of the number of surveys for which the demographic information either did not match or was blank.

Table 4: Number of Survey Pairs with Discrepant Demographic Information, Matched and Unmatched Handwriting

School	Similar Handwriting	Different Handwriting/ Can't Tell	Blank Demographic Section	Total
Comparison Elementary School A	9	10	4	23
Comparison Middle School	65	23	8	96
Pilot High School	46	27	65	138
Total	*120*	*60*	*77*	*257*

School Sample Descriptions

Comparison Elementary School A. Of the 83 respondents, 48% were female and 52% male. More than half (52%) indicated they were White, and 30% selected African American. Nearly half of the respondents (45%) were in the third grade, 23% were in the fourth grade, and 32% were in the fifth grade.

Comparison Elementary School B. Of the 306 respondents, 50% were male and 50% female. More than half (54%) were White, and 32% were African American. Respondents were grouped fairly evenly among the third grade (29%), fourth grade (38%), and fifth grade (33%).

Comparison Middle School. Of the 334 respondents, 52% were female and 48% male. More than half (61%) were White, and 26% were African American. More than a third (36%) were in the sixth grade, 40% were in the seventh grade, and 24% were in the eighth grade.

Comparison High School. Of the 765 respondents, 54% were female and 46% male. More than three fourths (76%) were White, and 15% were African American. More than a third (34%) were in the 9th grade, 31% were in the 10th grade, 20% were in the 11th grade, and 15% were in the 12th grade.

Pilot Elementary School A. Of the 76 respondents, 50% were female and 50% male. Nearly three fourths (71%) were African American, and 17% were White. Respondents were grouped fairly evenly among third grade (35%), fourth grade (39%), and fifth grade (26%).

Pilot Elementary School B. Of the 128 respondents, 44% were female and 56% male. Nearly half (49%) were African American, and 31% were White. Almost half (40%) were in third grade, 28% were in fourth grade, and 31% were in fifth grade.

Pilot Middle School. Of the 421 respondents, 57% were female and 43% male. More than half (59%) were White, and 24% were African American. Respondents were divided fairly evenly among sixth grade (36%), seventh grade (36%), and eighth grade (28%).

Pilot High School. Of the 562 respondents, 49% were female and 51% male. Nearly three fourths (71%) were White, and 18% were African American. Respondents were grouped fairly evenly among the 9th grade (32%), 10th grade (33%), and 11th grade (34%).

Measures

AEL MASC. The version of the AEL MASC used for the field test included 42 survey items plus 5 demographic items (student gender, ethnicity, grade level, length of time at school, and school name). It was hypothesized that the 42 survey items would be subsumed within the five subscales identified in the pilot test. The expected subscales and relevant items included the following: Staff Supportiveness - 8 items, Family Expectations - 10 items, Welcoming Environment - 8 items, School Ties - 8 items, and Student Academic Efficacy - 8 items.

The response options for the 42 items were based on a Likert-type 1 to 5 truth scale: 1 = Not at all, 2 = Rarely true, 3 = Sometimes true, 4 = Often true, 5 = Always true. A sixth option of "Don't know" was also provided.

Miami-Dade School Climate Survey. As a measure of concurrent validity, the Miami-Dade School Climate Survey was identified and secured to include on the field test of the AEL MASC. The survey was developed and is administered annually by Miami-Dade County (Florida) Public Schools. The student form of this instrument consists of 27 items structured as statements about the school. Respondents indicate the extent to which they agree or disagree with each of 26 items using a 5-point scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree and a midpoint of 3 = Undecided/Unknown. The 27th item asks students to give their school an overall grade of A, B, C, D, or F, and is used as an overall summary of an individual's item responses (Gomez & Shay, 2001). Staff and parent forms of the survey have also been developed; parent forms are available in English, Spanish, and Haitian Creole. The instrument has been shown to have good internal consistency (Cronbach Alpha > .90) and to have face validity with stakeholders including parents, school and district staff, and students. For use in the concurrent validity study, the 27th student item (overall school rating) was excluded.

Procedures

The two surveys (the AEL MASC and the Miami-Dade School Climate Survey) were merged into one four-page scannable survey for ease of administration. AEL staff sent an explanatory letter to the district superintendent and also provided a draft cover letter for his signature informing the eight principals that their schools were required to administer the AEL MASC as part of Kanawha County's ongoing collaboration with AEL in the MAACK Pilot Schools effort. The letter instructed elementary school principals to have teachers administer the MASC in grades three and higher. Middle and high school principals were instructed to have the survey administered in English/Language Arts classes to ensure that all students attending the school would have an opportunity and sufficient time to complete the MASC. (However, the surveys at Pilot High School were administered during homeroom instead.) Principals were asked to ensure that surveys were administered during the week of May 9, 2003, and to contact AEL following the administration to arrange for the completed surveys and any remaining unused materials to be collected.

Surveys were bundled into classroom-sized sets of 30 along with one instruction card for teachers in each bundle. The instructions for teachers administering the surveys were printed on heavy red card stock and surveys were printed on pink paper. Each bundle of surveys and instructions was placed in a 10 x 13 envelope. These envelopes were then placed in boxes labeled for each of the schools, along with extra copies of the survey bound with a rubber band.

Procedures for the three schools participating in the retest portion of the field test differed slightly because teachers were asked to administer the survey on two occasions approximately two weeks apart and because surveys had to be paired for each student without sacrificing confidentiality. Accordingly, teachers in these schools were asked to have students complete the pink AEL MASC survey, place the completed survey in a 9 x 12 envelope, seal the envelope, and write their name across the seal on the back. Teachers were asked to collect these envelopes and keep them in a safe place for approximately two weeks. At that time, teachers were to return each sealed envelope to the appropriate student and instruct students to open the envelope, remove the previously completed pink survey, and seal it in a new 9 x 12 envelope so that students' names were no longer associated with the data. Teachers were also asked to request that students avoid looking at their original survey responses during this process.

Next, teachers were asked to distribute the green copies of the AEL MASC and have students complete it. Afterward, each student was to seal this green copy and the 9 x 12 envelope containing the previously completed pink survey in a large (10 x 13) envelope. Teachers were asked to collect these large envelopes, seal them in the expandable white envelope provided, and return the packet of completed surveys to the school principal. Finally, teachers were asked to ensure that envelopes with names on them were empty and then destroy them.

For these three schools, sets of 30 pink and 30 green surveys were bundled along with 60 small 9 x 12 envelopes, 30 large 10 x 13 envelopes, one large expandable white envelope, and

one letter and instruction card for teachers. Again, these bundles were boxed and labeled for each of the schools, along with extra envelopes in both sizes and extra copies of the survey.

Staff from the four pilot schools received the survey materials for their schools at a MAACK Pilot Schools team meeting held at AEL's office on May 5 (given the larger number of students, AEL staff delivered the surveys to Pilot High School). On the next business day, an AEL staff member delivered the survey materials to each of the comparison schools.

The SEDCAR Standards Checklist was used to document the data collection methods used in this field test (Cooperative Education Data Collection and Reporting [CEDCAR] Standards Project Task Force, 1991).

Analyses

Surveys were scanned into school files using Remark software. School files were then exported to SPSS statistical software for cleaning, merging, and subsequent analyses. Descriptive statistics for the AEL MASC were generated by item for initial data exploration. All "don't know" responses were excluded from subsequent analyses. Only three items had this option selected by more than 10% of respondents (13%, 16%, 20%); two thirds of the items had the "don't know" option chosen by 5% or less. All analyses excluded missing responses.

Concurrent validity was established via a Pearson product moment correlation between the overall scores of the AEL MASC and the Miami-Dade School Climate Survey. Construct validity was measured via factor analysis of the 42 AEL MASC items. Internal consistency of the AEL MASC was measured via Cronbach Alpha reliability coefficients by subscales and for the total instrument; the internal consistency of the overall Miami-Dade School Climate Survey also was generated. Test-retest reliability for the AEL MASC was measured via Pearson correlations for each factor between test and retest scores for the full group and by subgroups.

FINDINGS

Validity

Construct*

According to Gable and Wolf (1993), factor analysis is used to examine "empirically the interrelationships among the items and to identify or verify clusters of items that share sufficient variation to justify their existence as a factor or construct to be measured by the instrument" (p. 108). The merged data file, with 1,008 cases (factor analysis excluded those 1,667 cases with missing responses to any of the 42 items on the AEL MASC), has a variable to case ratio of 24:1, well above the authors' minimal recommendation of 10:1.

A principal-component nonorthogonal oblique factor analysis was generated that retained factor eigenvalues greater than or equal to 1.0. The oblique method was chosen on the assumption that subsequent factors would be correlated with one another. As recommended by Gable and Wolf (1993), an orthogonal varimax factor analysis (independent factors) was also generated for comparison purposes. The oblique analysis resulted in four factors plus the beginnings of two additional factors; the varimax analysis resulted in five factors. For comparison purposes, both methods were again employed in generating a four-factor forced model. Inspection of all of these analyses revealed that the original oblique technique with eigenvalues greater than or equal to 1.0 resulted in the best-fitting model. The following results are based on this analysis.

The oblique factor analysis generated six factors; rotation converged in 11 iterations. The six rotated factor eigenvalues (in factor order) were 11.66, 7.22, 7.28, 7.23, 1.59, and 2.74. Inspection of the pattern matrix revealed that some items loaded on multiple factors, but most of these multiple loadings were below .300, indicating a much stronger loading on a single factor. Table 5 presents the pattern matrix from this factor analysis.

The fifth and sixth factors seemed to be mere beginnings of factors, even with eigenvalues above 1.0. The fifth factor was composed of two items, with loading values of .561 and .441. However, one of these items also loaded on the fourth factor at .338. The sixth factor was composed of only one item (loading value of .698), which did not load on any other factor at .300 or above. Therefore, these two factors were excluded from subsequent analyses.

The oblique factor analysis does not generate the percent of variance accounted for after rotation. However, Gable and Wolf (1993) suggest "the variance accounted for after rotation will be the same for each factor for the oblique and varimax solutions" (p. 127). Therefore, both of the varimax analyses were inspected. The unrestricted-factor model accounted for 52% of the variance; the four-factor model, 49%. Since the order of the third and fourth factors fluctuated between oblique and varimax rotations, individual factor percentages are not reported.

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*Although reliability is a prerequisite for validity, the results from the construct validity (factor analysis) are presented first so that the identified factors can be used in subsequent internal consistency and test-retest reliability analyses.

Table 5: Pattern Matrix for Oblique Factor Analysis of AEL MASC

Items	Factors					
	1	2	3	4	5	6
8	.825				.135	
13	.824					
40	.806					.128
22	.797	.137				
42	.758					-.124
17	.706			-.119		.111
35	.643			.216		
37	.639		.143	.124	-.248	-.110
12	.528		.144	.277	-.185	
24	.503	.179		.209		
27	.499					.291
33	.488		.171	.246	-.317	
7	.479		.223	.177	-.173	-.117
14	.468			.203	.178	.133
32	.437		.220			.110
18	.420		.107	.303	-.145	-.153
28	.355	.142	.149	.227	-.204	.115
3	.353	.188	.127	.228	-.276	
2	.345		.108			.334
26		.842				
38		.824				
11		.752				
41		.731			.104	
36		.720		.197		
31		.531	.198		.130	
19		-.185	.801			-.215
15		.161	.690		.130	
39	.119	.185	.591			
4			.570		.219	.295
34	.132	.156	.522	.123	-.127	
30		.415	.483			
10	.239	.146	.348			
5				.753	.215	
16				.658	-.198	.216
9				.625	.437	-.138
6		.229		.465	-.133	.172
21		.351		.398		.215
23	.394		.105	.397	-.117	.136
25	.149	.178	.174	.270	-.221	.200
20			.165		.561	.221
29	.150	.252		.338	.441	-.208
1				.133	.111	.698

To further substantiate the four-factor model, the component correlation matrix was inspected. The matrix in Table 6 shows that the first four components (factors) all correlate with each other above .30; the fifth and sixth factors have no correlations at this level.

Table 6: Component Correlation Matrix for Oblique Factor Analysis of AEL MASC

Component	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1	1.00					
2	.32	1.00				
3	.45	.32	1.00			
4	.45	.31	.33	1.00		
5	-.08	.04	.01	-.06	1.00	
6	.20	.28	.19	.10	.02	1.00

Finally, the four factors were named. Gable and Wolf (1993) suggest that items loading at .400 or above contribute most to naming the factors and should be studied most closely in interpreting the factor. After reviewing the analysis, the four factors were named: Factor 1 - Student Belonging, Factor 2 - Family Expectations, Factor 3 - Student Academic Efficacy, and Factor 4 - Family/School/Student Involvement.

After the factors were named, subscales were created in SPSS. Because the subscales had different numbers of items, item-level subscale means (total subscale score divided by number of items in the subscale) were used to enable cross-subscale comparisons. Table 7 depicts the descriptive statistics (number, mean, and standard deviation) for the four subscales for the full group and by subgroups. Figures 1 through 4 present bar charts of the four subscales by the full group and by subgroups (gender, ethnicity, and building level).

Table 7: Descriptive Statistics by Subscale for Full Group and Subgroups for AEL MASC

Sub-scales	Sta-tistics	Full Group	Gender		Ethnicity		Building Level		
			Male	Female	White	Af. Am.	Elem.	Mid.	High
Student Belonging	n	2,656	1,214	1,316	1,610	586	590	755	1,311
	mean	**3.54**	**3.50**	**3.60**	**3.52**	**3.67**	**4.06**	**3.51**	**3.33**
	SD	0.80	0.81	0.77	0.78	0.76	0.69	0.77	0.75
Family Expec-tations	n	2,636	1,207	1,313	1,604	585	590	752	1,294
	mean	**4.50**	**4.41**	**4.60**	**4.51**	**4.56**	**4.63**	**4.58**	**4.39**
	SD	0.69	0.74	0.59	0.66	0.62	0.60	0.58	0.77
Student Academic Efficacy	n	2,652	1,212	1,316	1,609	586	590	754	1,308
	mean	**3.74**	**3.72**	**3.79**	**3.74**	**3.84**	**3.97**	**3.77**	**3.62**
	SD	0.74	0.75	0.69	0.72	0.68	0.71	0.72	0.73
Family/ School/ Student Involve.	n	2,651	1,213	1,315	1,608	586	589	755	1,307
	mean	**3.81**	**3.77**	**3.88**	**3.79**	**3.96**	**4.36**	**3.95**	**3.49**
	SD	0.82	0.83	0.80	0.81	0.77	0.62	0.76	0.79

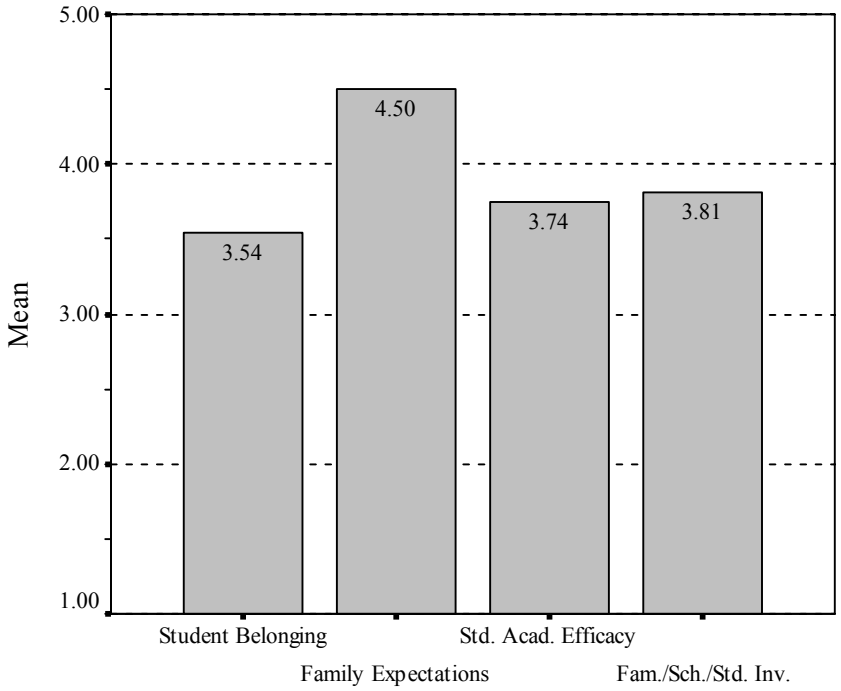

Figure 1: AEL MASC Subscale Means for Full Group

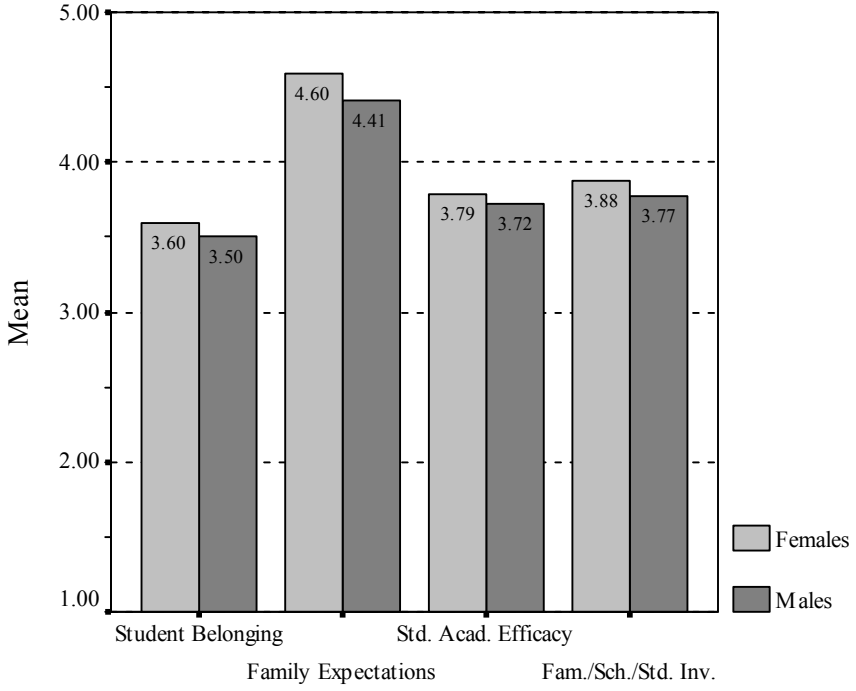

Figure 2: AEL MASC Subscale Means by Gender

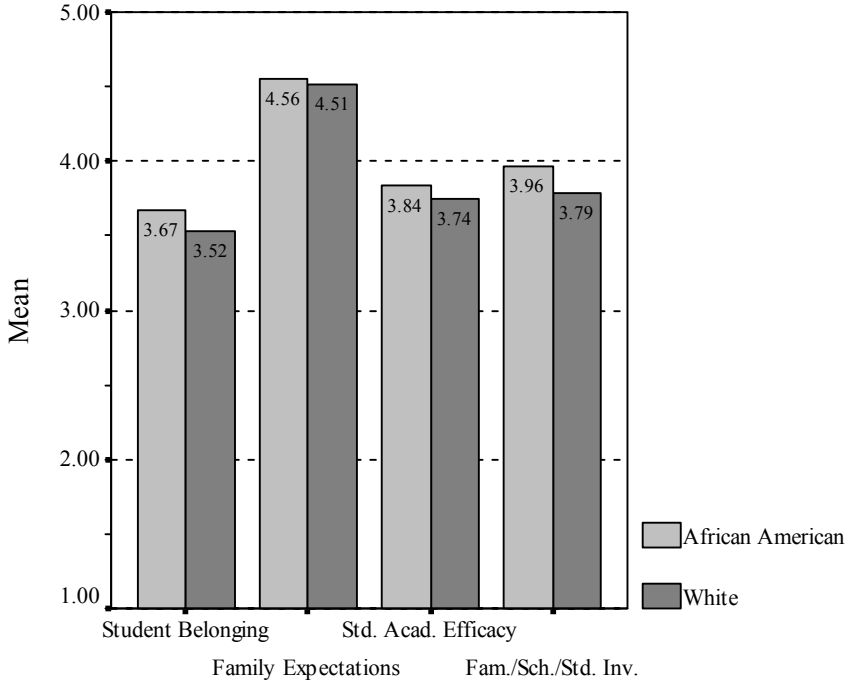

Figure 3: AEL MASC Subscale Means by Ethnicity

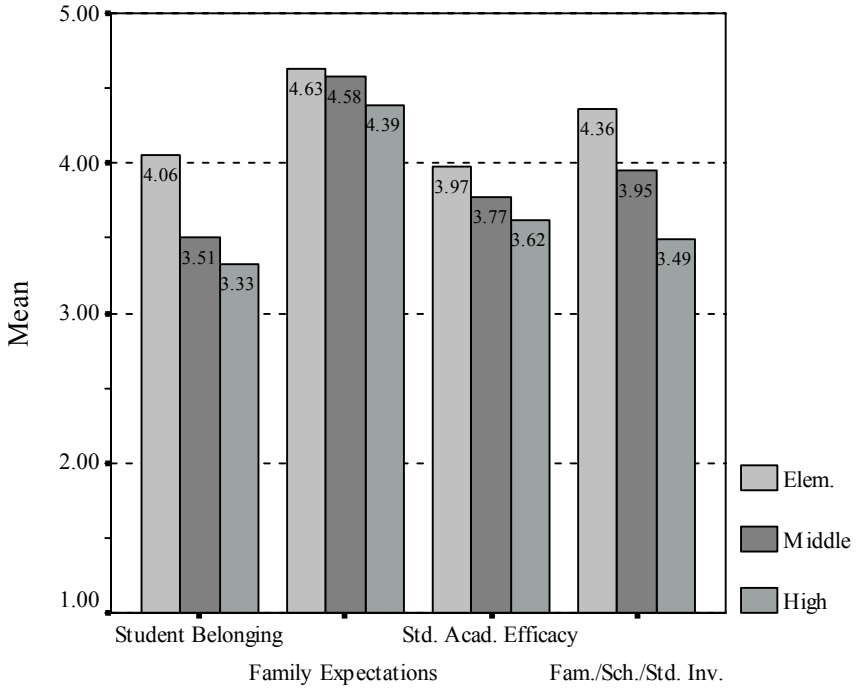

Figure 4: AEL MASC Subscale Means by Building Level

Concurrent

As a measure of concurrent validity, the AEL MASC scores were correlated with those of the Miami-Dade School Climate Survey, an instrument with previously established reliability and validity in assessing school climate from the students' perspective. Table 8 shows the results of Pearson product moment correlations for the totaled 42 items on the AEL MASC with the totaled 26 items on the Miami-Dade School Climate Survey for the full group and by subgroups. Except for the high school analysis, all correlations were in the .50 range, indicating a moderate relationship (Hinkle, Wiersma, & Jurs, 1998). All analyses were significant at the .01 level, which is not unexpected given the large sample size.

Table 8: Concurrent Pearson Product Moment Correlations by Full Group and Subgroups for Total Score on AEL MASC and Miami-Dade School Climate Survey

	Full Group	Gender		Ethnicity		Building Level		
		Males	Females	White	Af. Am.	Elem.	Mid.	High
Total score on both surveys	.56* n=2,599	.56* n=1,204	.57* n=1,312	.58* n=1,604	.54* n=583	.52* n=589	.58* n=743	.49* n=1,267

*Significant at .01

Reliability

Internal Consistency

As a measure of the internal consistency of the overall Miami-Dade School Climate Survey, Cronbach Alpha reliability coefficients for this administration were generated for the full group and by gender, ethnicity (White and African American), and building level (elementary, middle, and high school). Table 9 shows the overall reliability was high for this administration of the instrument, ranging from .84 to .91 for this set of scores.

Table 9: Cronbach Alpha Reliability Coefficients by Full Group and Subgroups for Miami-Dade School Climate Survey

	Full Group	Gender		Ethnicity		Building Level		
		Males	Females	White	Af. Am.	Elem.	Mid.	High
All items on Miami-Dade School Climate Survey	.90 n=2,165	.91 n=1,024	.89 n=1,113	.90 n=1,393	.88 n=462	.84 n=426	.89 n=628	.90 n=1,111

As a measure of the internal consistency of the overall AEL MASC and its four identified factors, Cronbach Alpha reliability coefficients were generated for the full group and by gender, ethnicity (White and African American), and building level (elementary, middle, and high school) for this administration. Table 10 shows that the overall internal consistency reliability was very high, ranging only marginally from .93 to .95 across the various breakdowns. Of the four factors, Student Belonging was most reliable, with coefficients ranging across breakdowns from .90 to .94. The remaining three factors were slightly less reliable, with coefficients ranging from .64 to .84. Of the 24 cells, 18 had coefficients in the .70's, 5 were in the .80's, and 1 was in the .60's (middle school breakdown for Family Expectations).

Table 10: Cronbach Alpha Reliability Coefficients by Full Group and Subgroups for AEL MASC

	Full Group	**Gender**		**Ethnicity**		**Building Level**		
		Males	**Females**	**White**	**Af. Am.**	**Elem.**	**Mid.**	**High**
All items on AEL MASC	.95 n=1,008	.95 n=434	.95 n=550	.95 n=678	.94 n=188	.93 n=198	.94 n=239	.94 n=571
Factor 1: Student Belonging	.93 n=1,337	.93 n=593	.94 n=707	.94 n=866	.92 n=268	.90 n=308	.93 n=336	.93 n=693
Factor 2: Family Expectations	.79 n=2,111	.80 n=954	.77 n=1,091	.80 n=1,337	.75 n=456	.75 n=447	.64 n=592	.84 n=1,072
Factor 3: Student Academic Efficacy	.78 n=2,007	.79 n=912	.78 n=1,042	.80 n=1,287	.70 n=427	.73 n=406	.78 n=573	.79 n=1,028
Factor 4: Family/School/ Student Involvement	.79 n=1,988	.79 n=898	.79 n=1,033	.80 n=1,258	.74 n=430	.71 n=444	.73 n=557	.76 n=987

Test-Retest

As a measure of reliability over time (stability), participants at three of the schools (a comparison elementary school, the comparison middle school, and the pilot high school) completed the AEL MASC twice, with a two-week interval between administrations. Table 11 shows the results of Pearson product moment correlations for each factor by participants' original test and subsequent retest scores for the full group and by subgroups. This table shows an overall pattern of stability for the entire AEL MASC and its four identified subscales.

However, the Family Expectations factor held up least well over time, with correlations ranging from .44 to .54. Overall, these correlations indicate a medium relationship (Hinkle, Wiersma, & Jurs, 1998). All analyses were significant at the .01 level, which is not unexpected given the large sample size.

Table 11: Test-Retest Pearson Product Moment Correlations
by Full Group and Subgroups for AEL MASC

	Full Group	Gender		Ethnicity		Building Level		
		Males	Females	White	Af. Am.	Elem.	Mid.	High
All items on AEL MASC	.68* n=763	.67* n=362	.73* n=383	.70* n=503	.74* n=157	.69* n=44	.74* n=293	.63* n=426
Factor 1: Student Belonging	.76* n=762	.74* n=362	.78* n=382	.76* n=503	.80* n=157	.78* n=44	.77* n=293	.74* n=425
Factor 2: Family Expectations	.52* n=754	.48* n=358	.53* n=380	.54* n=500	.46* n=157	.46* n=44	.44* n=292	.54* n=418
Factor 3: Student Academic Efficacy	.66* n=760	.65* n=361	.68* n=382	.65* n=503	.68* n=156	.68* n=44	.70* n=293	.62* n=423
Factor 4: Family/School/ Student Involvement	.71* n=760	.67* n=362	.75* n=382	.71* n=503	.76* n=157	.66* n=44	.78* n=293	.61* n=423

*Significant at .01

Caution

Readers should interpret these results with caution. Because these results are based on data from one county school district in one state, they are not generalizable to a wider population. Although the data reported herein certainly suggest that the AEL MASC is valid and reliable, it is not clear whether this might be the case if the instrument were administered in other locales or other types of schools.

CONCLUSIONS

The AEL MASC possesses face and concurrent validity, as well as evidence of construct validity. It is an instrument that assesses what it purports to measure, and it is correlated with another instrument assessing similar constructs.

The AEL MASC possesses test-retest reliability, in that it measures the relevant constructs consistently over time. Internal consistency of the AEL MASC and its four subscales has been verified. Thus, the items and subscales measure the constructs reliably.

The AEL MASC includes four fairly robust subscales or factors: Student Belonging, Family Expectations, Student Academic Efficacy, and Family/School/Student Involvement. Taken together, these subscales assess the degree to which students think that their schools and families provide them with academic nurturance and support, and the extent to which students view themselves as intellectually capable.

The field-test administration of the AEL MASC identified differences in students' perceptions that they belonged at school, their family had high expectations for them, they were academically efficacious, and their family was involved in their school life. Females had higher perceptions for each of these four areas than males. Further, elementary students had higher perceptions for each area than middle and high school students; middle school students also had higher perceptions than high school students in each area.

The AEL MASC has the potential for use in planning school improvement efforts, gauging school climate, and investigating factors contributing to achievement gaps based on gender or race, especially in the district where this field test was conducted.

African American students' perceptions were higher on all four subscales of the AEL MASC than those of their White counterparts. In other words, their sense of belonging, family expectations, and academic efficacy, as well as the level of family/school/student involvement, were all slightly more favorable. Their more positive sense of academic efficacy is somewhat surprising, given the achievement gap between White and minority students in this district—their perceptions of academic efficacy do not seem to be linked to equivalent or higher academic performance.

Griffard and Wandersee (1999) suggest that teachers may, consciously or otherwise, promote "confidence without competence" in their African American students by making them feel good about themselves yet failing to nurture them intellectually. Raspberry (2003), in a discussion of Ogbu's 2003 Shaker Heights study, notes the achievement gap may actually be an "effort" gap. Ogbu found that even though the African American children in this district outperformed other African American youth in the state and much of the nation, they still lagged behind their White schoolmates. His research found the African American students put forth less academic effort, yet realized the importance of academic achievement. The Shaker Heights students did not think they lacked the ability to make better grades; they recognized they could do better if they worked harder, but "chose not to" (p. 20). On a similar note, Quaglia and Perry

(1993) suggest that student aspirations are composed of both inspiration and ambition. They define ambition as the ability to look ahead and invest in the future and inspiration as the ability to invest the time, energy, and effort to reach their ambitions. It may be that the academic efficacy perceptions of the African American students participating in the field-test administration of the AEL MASC were indicating a presence of ambitions yet a lack of inspiration.

RECOMMENDATIONS

First, the validity and reliability of the AEL MASC should be verified more robustly with data from a larger and more diverse student population. Thus, it is recommended that the instrument be field tested again with a student sample from other states, schools, and locale types. Such an action would strengthen the instrument and allow for legitimate claims of generalizability.

Second, based on the results of any further field tests, staff should consider eliminating the two items that did not load on any of the four subscales or factors. If further analyses confirm that neither item contributes meaningfully or statistically to the overall instrument or the four subscales, and that the items are unrelated to each other, then this action would be a valid refinement of the AEL MASC.

Third, staff may want to consider other ways of administering surveys to students in the future, given the response problems identified through this field test. For example, assigning an identification code through the use of bar codes might facilitate any matching of students' surveys for longitudinal studies.

Fourth, staff may want to explore whether and to what extent the instrument is able to discriminate between schools known to encourage academically nurturing climates and those known to face challenges in this regard. Such analyses would strengthen claims that the instrument accurately and reliably assesses differences between schools.

Fifth, after the AEL MASC is further validated (perhaps via known groups or divergence), future analyses may investigate whether the instrument can statistically identify differences among students' scores in terms of gender, race, or other indicators such as achievement level or socioeconomic status.

Sixth, given the discrepancy between African American students' higher sense of academic efficacy for this administration of the AEL MASC yet their lower overall achievement, it may be worth including a sample of student interviews with the next administration of the instrument to collect data on relevant issues such as recognition of levels of effort for academic achievement and the reasons for putting forth academic effort or not.

REFERENCES

Cooperative Education Data Collection and Reporting (CEDCAR) Standards Project Task Force. (1991). *SEDCAR (Standards for Education Data Collection and Reporting).* Washington, DC: National Center for Education Statistics, Office of Educational Research and Improvement, U.S. Department of Education.

Gable, R. K., & Wolf, M. B. (1993). *Instrument development in the affective domain: Measuring attitudes and values in corporate and school settings* (2nd ed.). Boston: Kluwer Academic Publishers.

Gomez, J. J., & Shay, S. A. (2001*). Evaluation of the Edison Project School Final Report: 1999-2000 school year*. Miami, FL: Miami-Dade County Public Schools, Office of Evaluation and Research.

Gottfredson Associates. (2001). *School Diversity Inventory.* Ellicott City, MD: Author.

Griffard, P. B., & Wandersee, J. H. (1999). Challenges to meaningful learning in African-American females at an urban science high school. *International Journal of Science Education, 21*(6), 611-632.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1998). *Applied statistics for the behavioral sciences* (4th ed.). Boston, MA: Houghton Mifflin.

Pohan, C., A., & Aguilar, T. E. (2001). Measuring educators' beliefs about diversity in personal and professional contexts. *American Educational Research Journal, 38*(1), 159-182.

Quaglia, R. J., & Perry, C. M. (1993, April). *A study of underlying variables affecting aspirations of rural youth.* Paper presented at the annual meeting of the American Educational Research Association, Atlanta, GA.

Raspberry, W. (2003, October 7). The academic gap may be an effort gap. *The Seattle Times.* Retrieved October 14, 2003, from http://archives.seattletimes.nwsource.com/cgi-bin/texis.cgi/web/vortex/display?slug=raspberry07&date=20031007

Rothfarb, S. H. (1992). *Perceptions of intergroup relations in secondary schools of Dade County Public Schools: Results of the students multicultural relations survey.* Miami, FL: Dade County Public Schools, Division of Program Evaluation.

Walberg, H. J., Anderson, G. J., & Cayne, R. E. (1969). *Learning environment inventory.*

Wayman, J. C. (2002, April). *Student perceptions of teacher ethnic bias: Implications for teacher preparation and staff development.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.