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# Dimensions of Student Engagement in American Community Colleges:

# Using the Community College Student Report in Research and Practice

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*The Community College Student Report (CCSR) is a widely used survey instrument. This article examines the reliability and validity of the instrument to assess its usefulness in institutional research and practice. Confirmatory factor analyses demonstrate that factor analytic models adequately represent underlying constructs. Confirmatory factor analysis is also used to demonstrate measurement invariance across sex, part- and full-time status, and year of administration. The constructs have reasonable internal reliability and test-retest reliability. Grade point average was regressed on latent factors and consistently demonstrated a positive association with latent engagement constructs. These analyses establish the CCSR as a reliable instrument that can be used to inform institutional decision-making with regard to teaching practices, campus design, and institutional culture. Additionally, these analyses establish constructs that can be used for research with community college students.*

Student engagement is a broadly defined term used to refer to the extent to which students are actively involved in meaningful educational experiences and activities. Extensive research on student engagement consistently suggests that student engagement is tied to desired educational outcomes such as increased learning, persistence in college, and graduation (Pascarella & Terenzini, 2005). While the relationship between student engagement and desired outcomes is clear, the preponderance of research supporting this connection has been conducted with students at four-year institutions. Pascarella (1997) acknowledges that of the approximately 2600 studies reviewed for the seminal text that he co-authored with Terenzini in 1991, *How College Affects Students*, at most 5% of the studies focused on community college students. An examination of approximately 2300 articles published between 1990 and 2003 in five major higher education journals found that only 8% mentioned community colleges (Townsend, Donaldson, & Wilson, 2004). There are substantial differences in the institutional missions, environmental characteristics, and populations served by the two-year sector and four-year sector that warrant a need for additional research to understand the extent to which the research conducted at 4-year institutions can be generalized to community colleges.

The study of student engagement and its relationship to desirable educational outcomes in the two-year sector is aided by the introduction of a national survey instrument, the *Community College Survey of Student Engagement* (CCSSE), developed to capture the experiences and activities of students in the two-year sector. Data obtained from the CCSSE instrument, the *Community College Student Report* (CCSR), are intended to be used as a tool for improving teaching and learning by assessing the extent to which students are engaging in good educational practices at community and technical colleges. The CCSR was adapted from the National Survey of Student Engagement's (NSSE) instrument, the College Student Report (CSR), with permission from Indiana University. The CSR was developed in 1999 for use in four-year colleges and universities. There is a high degree of intentional overlap between the NSSE and CCSSE instruments. Of the 82 items measuring student engagement on the NSSE instrument, 55 appear on the 2005 version of the CCSR, representing a 67% overlap between the two instruments. Psychometric properties of the NSSE instrument have been explored extensively and have demonstrated that the instrument is reliable and valid (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003; Kuh, Hayek, Carini, Ouimet, Gonyea, & Kennedy, 2001; Kuh, 2002). Understanding the psychometric properties of the CCSR is a critical prerequisite for its use for research and evaluation purposes.

## Theoretical Basis of the Community College Student Report

The CSR and consequently the CCSR were based on a broad body of research and theoretical perspectives indicating that positive educational outcomes are associated with student engagement (Astin, 1985; Pace, 1984; Pascarella & Terenzini, 2005; Tinto, 1993). While there are important differences in the theoretical perspectives explaining how students change across time as a result of their college experiences, student engagement underlies the major theoretical frameworks explaining change during the college years. Astin's (1985) theory of involvement proposes that student learning is a function of a student's level of academic and social involvement with the institutional environment. In Pace's (1984) theory, quality of effort is a function of the opportunities that an institution offers and the extent to which students make use of those opportunities in their academic and intellectual experiences, as well as their personal and interpersonal experiences. Tinto's (1993) model of student departure emphasizes the role of integration, described as the extent to which students share values and norms of other individuals in the institution, in persistence in college. Despite important differences in these theoretical perspectives, student engagement plays an important role in each of the theoretical frameworks, so the frameworks provide impetus for measuring engagement.

The literature supporting the aforementioned theoretical perspectives is too voluminous to comprehensively review herein; however, illustrative examples demonstrate the empirical underpinnings motivating the examination of engagement in research and practice. Active learning activities, such as class discussions, have a positive relationship with student persistence (Braxton, Milem, & Sullivan, 2000). Use of student support services, such as peer counseling, positively impacts student retention (Chaney, Muraskin, Cahalan, & Goodwin, 1998). Academic and out-of-class experiences have been shown to contribute to gains in intellectual orientation and curiosity after controlling for pre-college characteristics (Terenzini, Springer, Pascarella, & Nora, 1995). Thomas (2000) demonstrated that academic integration, defined as satisfaction with intellectual development, academic experience and its impact on personal growth and interest in ideas, is a positive predictor of persistence. Faculty-designed instructional practices promoting active learning, such as class discussions, have been demonstrated to have a positive influence on subsequent institutional commitment and intent to return (Braxton et al., 2000). There is a positive association between student-faculty interactions and students' satisfaction, and there is a positive association between student-faculty interactions and the amount of time that students devote to educationally purposeful activities (Kuh, & Hu, 2001). These empirical examples represent only a fraction of the literature supporting the importance of involvement and emphasis on the role of the environment posited in Astin's (1985) theory; the quality of experience as a function of quality of effort offered by an institution in Pace's (1984) theory;

and students' perceptions of the institutional environment and relationships with others in that environment described by Tinto (1993).

While there is voluminous evidence supporting a positive relationship between student engagement and successful outcomes, higher education research is disproportionately conducted on students at four-year institutions (Pascarella, 1997; Townsend et al., 2004), which may not always generalize to students at two-year institutions. A recent review of the empirical evidence for Tinto's theory of student departure found that there are notable differences in the theory's applicability to the two- and four-year sectors (Braxton, Hirschy, & McClendon 2004). Examining thirteen testable propositions in Tinto's theory, the authors report that there is robust empirical affirmation for only one of the propositions in the two-year sector, student entry characteristics, in contrast to support for two propositions in commuter institutions and support for five propositions in residential institutions. While the review by Braxton, Hirschy, and McClendon (2004) focuses on Tinto's theory, the lack of evidence supporting constructs such as academic and social integration has implications for other theoretical perspectives, such as Astin's and Pace's, which postulate the importance of student involvement, student effort, and institutional environment. This review generally indicates that theories largely developed and largely supported by research conducted with students at baccalaureate institutions are likely to fit students at those institutions better than students at two-year institutions. This assessment, in conjunction with the paucity of research conducted on students in the two-year sector (Pascarella, 1997; Townsend et al., 2004), indicates that there is a need for additional research investigating academic and social engagement in the two-year college environment and its relationship to student success. Thus, the establishment of the CSSR as an instrument useful for examining student engagement will be valuable in examining the relevance of established theoretical perspectives in the community college sector.

## Development of Latent Construct Models

There were two overlapping goals in the model development phase of this study. The first goal was to define the model of best fit, which is a theoretically meaningful model of the underlying dimensions of student engagement that provide the best statistical fit to the data as measured by fit indexes. This model, hereafter referred to as the model of best fit (MBF), is intended to provide a factor structure for the CCSR engagement items that separates these items into their various components as granularly as necessary to separate the underlying latent constructs. The second goal was to construct benchmarks of effective educational practices, which was accomplished by reducing the number of constructs in the MBF to a practically useful number of constructs that could be used as performance measures of institutional effectiveness. This model is hereafter referred to as the model of effective educational practices (MEEP). The primary use of these factors in the MEEP will be a general guide that practitioners can use to identify areas of strength and weakness in student engagement at the institutional level. Constructing a latent variable model with the best fit to the data and creating latent constructs useful for evaluating the engagement of a student body are clearly complementary efforts. Nevertheless, the two goals diverge, as optimal model fit requires a granular model of latent constructs whereas establishing benchmark measures is a molar endeavor that seeks to broadly classify items with less concern for the precision of model fit. Both models were constructed using confirmatory factor analysis (CFA) and were evaluated according to conventional measures of model fit (Hu & Bentler, 1999). CFA models define the relationship between items and the factors with which they are associated a priori.

Following the establishment of CFA models, reliability and validity were assessed in subsequent analyses. Measurement invariance was examined through a multiple-group CFA that analyzed consistency across administration years, males and females, and part- and full-time students. Consistency within constructs was assessed using Cronbach's Alpha. Test-retest reliability was assessed by comparing results from individuals' repeat survey administrations. Validity was assessed by regressing student's reported GPA on each of the latent constructs in the models.

## Methods

### *Participants*

Participants were respondents sampled in 2003, 2004, and 2005 administrations of the CCSR. The 2003 sample consisted of 103 colleges; the 2004 sample consisted of 152 colleges; and the 2005 sample consisted of 257 colleges. In 2003, there were 60,681 surveys returned; in 2004, there were 98,794 surveys returned; and in 2005, there were 140,287. Returned surveys were excluded from analysis if they met one or more of the following exclusion criteria: respondents did not indicate whether they were part-time or full-time students; respondents did not indicate that it was the first time they had taken the survey; the survey form was not returned in the class packet to which it was assigned; or respondents were less than eighteen years of age. After exclusions, there were 53,358 respondents from the 2003 administration; 92,301 respondents from the 2004 administration; and 129,035 respondents from the 2005 administration used in the analysis. Demographic characteristics of the analysis samples and population data are compared in Table 1. Population data were obtained from the most recent available

Integrated Postsecondary Education Data System (IPEDS), which were 2003 data for each of the three administration years. There is generally a close match between sample and population demographics with the exception of part- and full-time status where full-time students are disproportionately represented as a result of the classroom sampling method that increases the possibility that they are sampled. Point estimates presented by CCSSE typically weight data by part- and full-time status to proportionally adjust results.

<Insert Table 1 here>

### *Measure*

The CCSR is designed to measure student engagement, and the items examined in the current analysis pertain to time spent on activities that previous research has shown to be related to desirable educational outcomes. For all analyses, items were rescaled so that the low and high bounds of each item were equal across all scales. This was done by converting all scores to proportions of their totals so that the low end of the scale was always zero and the high end was always one. For example, a four on a seven-point scale and a three on a five-point scale both equal .5. Don't Know/Not Applicable responses on items measuring frequency of use were treated as missing. See Appendix A for a summary of the items used in the present analysis.

### *Sampling*

Sampling was designed to provide a representative sample within each participating institution. A stratified random cluster sample scheme is used in which each class is a cluster. While cluster sampling's major disadvantage is increased standard errors, the concern is offset by the feasibility of collecting larger amounts of data, which decreases standard errors as a function of increased sample sizes (Levy & Lemeshow, 1999). The in-class administration process used for the CCSR substantially increases sample sizes and thus justifies the implementation of cluster sampling. Sampled classes are pulled from a list of all credit courses at an institution. The stratification is conducted at three levels based upon the time of day at which the class begins: (1) 11:59 a.m. and earlier, (2) 12:00 p.m. to 4:59 p.m., and (3) 5:00 p.m. to 12:00 a.m. Stratification ensured that the number of courses in each time period in the sample of classes was proportional to the number for that time period in the population of classes.

### *Administration*

Survey administration took place in the classrooms during regularly scheduled class meeting times and was not announced to the students in advance. Survey administrators were given a script that they read to students in each classroom. The script instructed students to complete all items on the survey and reminded them that the survey is about their experiences at the college where the survey is being administered. They were asked to fill out the survey again even if they had taken the survey in another class.

## Results

### *Missing data*

Missing data present problems for many inferential statistical analyses because all data for a case are dropped when a data point from a single variable is missing. While using only complete cases is more than sufficient in terms of statistical power, the possibility that respondents who did not complete all responses may be systematically different than those who did introduces the possibility that dropping cases with missing data could bias the models. To compensate for this, multiple imputation (MI) was used to generate plausible values for missing responses. A Markov Chain Monte Carlo (MCMC) method (Schafer, 1997) was used to impute all missing values. Three to five imputations have been shown to be adequate (Rubin, 1987); thus, the number of imputations was set at five. Analyses using missing data were conducted in three phases: (1) missing data are imputed 5 times, generating 5 complete data sets; (2) the complete data sets imputed in the first phase are each analyzed identically; and (3) inferential results are combined from the five complete data sets. The missing data were imputed using the SAS MI procedure. Each of the five imputed data sets was analyzed and results were combined by averaging parameter estimates across all analyses and standard errors were computed using the average of the squared standard errors over each of the five analyses. The benefit derived from imputation is that the non-missing data from respondents with one or more missing values is used in model construction.

### *Factor Structure*

Following exploratory analyses, CFA was used to specify the MBF with nine latent constructs. Models were evaluated using the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Residual (SRMR) following the two-index presentation strategy recommended by Hu and Bentler (1999). The two-index presentation strategy implements two indexes that are not highly correlated to avoid the use of redundant fit index information. RMSEA and SRMR were chosen because simulation studies have demonstrated that these indexes are dissimilar under various sample sizes, distributional violations, and model misspecifications. Using the combinatorial cutoff of RMSEA < .06 and SRMR < .09 minimizes Type I and Type II error rates and was thus used for evaluating all models. All CFA models were constructed using the Mplus application (Muthén & Muthén, 2004). Maximum likelihood estimation with robust standard errors was used for all analyses as the assumption of joint multivariate normality was not tenable. The factor structure was confirmed as having good model fit; the model RMSEA averaged across the five imputed data sets was .050 and the SRMR averaged across the five imputed data sets was .054. Standardized coefficients, representing the change in latent construct per standard deviation unit of a predictor variable, are reported in Appendix A. Standardized coefficients were derived from a single imputed data set due to a software limitation that currently does not provide standardized coefficients averaged across multiply imputed data sets. RMSEA and SRMR values for that model were identical to the multiple imputation results.

To establish the factor structure for the benchmarks of effective educational practice, a group of survey research experts (CCSSE's Technical Advisory Panel) reviewed the CFA results and then assigned items to benchmarks, taking into account the results of factor analysis, reliability tests, and also applying expert judgment based on both the conceptual framework and empirical evidence related to student engagement in undergraduate learning. The objective was to create benchmarks that are reliable, useful, and intuitively compelling to community college educators. The benchmarks of effective educational practice model were specified as having a five-factor structure. The five-construct solution exhibited reasonable model fit (RMSEA = .060, SRMR = .062). The RMSEA falls into a range considered adequate fit and the SRMR was in the range of good fit. Standardized coefficients, representing the change in latent construct per standard deviation unit of a predictor variable, are reported in Appendix A. Standardized coefficients were derived from a single imputed data set with RMSEA and SRMR values identical to those in the multiple imputation results.

### *Measurement Invariance*

Three multiple-group analyses were undertaken to examine measurement invariance across subgroups within the sample: (1) 2003, 2004, and 2005 participants; (2) males and females; and (3) part-time and full-time students. A broad classification scheme for types of measurement invariance proposed by Little (1997) distinguishes between measurement invariance as the psychometric properties of scales and measurement invariance as between-group differences in latent means, variances, and covariances. The goal of the current analyses is to demonstrate psychometric measurement invariance. In all measurement invariance models presented herein, factor loadings were constrained to be equal across all groups in the models and structural parameters were freely estimated across groups. To avoid a well-known problem with difference tests in large samples based on $\chi^2$ values, recommendations were examined from Cheung and Rensvold's (2002) simulation study of difference tests from 20 goodness-of-fit (GFI) indexes. Difference tests examine measurement invariance as $\Delta$GFI = $GFI_c - GFI_{uc}$, where $GFI_c$ is the GFI value in the constrained model and $GFI_{uc}$ is the GFI value in the unconstrained model. RMSEA estimation performed well under various samples sizes and was the one index not impacted by the number of items and factors, though standard errors were influenced by number of items and factors, which precludes the use of confidence intervals. Models were compared using Cheung and Rensvold's (2002) recommended metric invariance cutoff of .0126 for ΔRMSEA.

Tests of measurement invariance in multiple-group CFA demonstrated that there were not differences in the measurement model across the groups examined. The MBF exhibited equivalent fit in the unconstrained model and the constrained model across the three administration years (ΔRMSEA = .000); equivalent fit in the unconstrained model and the constrained model across males and females (ΔRMSEA = -.001); and equivalent fit in the unconstrained model and the constrained model across part- and full-time students (ΔRMSEA = -.008). The MEEP multiple-group CFA also exhibited equivalent fit in the unconstrained model and the constrained model across the three administration years (ΔRMSEA = .000); equivalent fit in the unconstrained model and the constrained model across males and females (ΔRMSEA = .000); and equivalent fit in the unconstrained model and the constrained model across part- and full-time students (ΔRMSEA = -.001).

### *Construct Reliability*

Evaluation of Cronbach's alpha values showed that there was generally strong consistency in the underlying construct being measured within a factor, though some alpha values did not exceed the gold standard of .70. See Table 2 for Cronbach's alpha values for all constructs.

### *Test-Retest Reliability*

Test-retest reliability was assessed on respondents that took the survey more than once during the same administration year. Because sampling units are classrooms and not individuals, some students were in more than one sampled course. While only the first completed surveys were included in analyses, the second completed surveys provide an opportunity to examine test-retest reliability. Test-retest analyses were limited to surveys where respondents provided an ID. To avoid common invalid ID values (e.g., 00000000000), only identifiers that appeared exactly twice were used in analyses. Across the three administration years, there were 582 respondents with data appropriate for test-retest analyses. Test-retest correlations are listed in Table 2, showing that there is a high degree of consistency between first and second survey administrations.

<Insert Table 2 here>

***Model Validation***

To examine the relationship between self-reported GPA and the latent constructs, GPA was regressed on each of the factors in MBF and MEEP. Hierarchical linear models (HLM) were used so that the nested structure of the data was appropriately modeled. Participants were nested within colleges and colleges were nested within administration years, making the data a typical multilevel structure in which respondents within an institution are expected to have correlated responses as a result of attending the same institution that are accounted for through random effects (Raudenbush & Bryk, 2002). The HLM software package was used for all analyses. The same five imputed data sets used in the CFA models were used in the HLM models. In each model, the level-1 intercept was treated as random, allowing variation between colleges, and the level-2 intercept for the equation predicting GPA was treated as random, allowing variation across administration years. In addition, the college average was entered as a level-2 variable predicting individual's GPA. By including the institution's mean value for a putative construct, the possibility that institutional levels of engagement explained differences in individuals' GPAs was accounted for in the models. The three-level model can be simplified to a mixed model format with the following form:

$$\mathrm{GPA} = \gamma_{000} + \gamma_{010}(\mathit{factor}) + \gamma_{100}(\mathit{factor}) + r_0 + u_{00} + e$$

In the above model, GPA is regressed on a putative factor from the MEEP or MBF CFA to examine the relationship between GPA and person-level engagement as measured by the slope parameter $\gamma_{100}$, henceforth referred to as the person-level effect, and to examine the relationship between GPA and institution's mean engagement as measured by the slope parameter $\gamma_{010.}$, henceforth referred to as the institution-level effect. Error terms represent individual students' error with the level-1 error term $e$, institutional error with the level-2 error term $r_0$, and administration year error term with the level-3 error term $u_{00}$. See Table 3 for a summary of the MBF models. See Table 4 for a summary of the MEEP models. Random parameters for level-2 and level-3 of the model were significant in each instance with one exception; the level-3 error term information technology factor in the MBF was not significant.

<Insert Table 3 here>

<Insert Table 4 here>

**Discussion**

***Reliability and Validity of the CCSR***

The three phases of model development, establishing CFA models, demonstrating reliability, and demonstrating validity with GPA, indicate that the instrument and the constructs derived from it are reliable and valid measures of student engagement in the two-year sector. In the first phase, model fit measures demonstrated that the MBF met the criteria of good model fit and the MEEP was in the good to adequate range of model fit. In the second phase of model development, reliability was primarily assessed through multiple-group CFA models that tested measurement invariance across groups. Validity was assessed in the third phase by regressing GPA on a putative construct postulated in the MBF and MEEP, generally showing the anticipated relationship between GPA and the latent constructs. These results indicate that the CCSR is appropriate for use in a wide variety of populations, as respondents are answering questions in a reliable manner and the results can be demonstrated to be effectively related to other relevant measures.

Multiple-group analyses demonstrated measurement invariance across administration years, males and females, and part- and full-time students by constraining factor loadings to be equal across groups. The year to year comparison demonstrates that the instrument is measuring the same constructs in different years and can thus be used to track changes across time. Measurement invariance across subgroups in the CCSSE sample indicates that any differences observed across groups in levels of engagement are due to the differences in means, variances, and covariances, and not to differences in the measurement model that defines the relationships between the items forming the latent constructs. Demonstrating the assumption of measurement invariance across years and subpopulations within community colleges is critical for research efforts using factors derived from the instrument, given that many of the most interesting analyses are comparisons between various subgroups within the larger population.

Construct reliability assessed with Cronbach's alpha was adequate and informative but not essential to establishing the reliability of the instrument. Cronbach's alpha measures the extent to which items are measuring a one-dimensional latent construct. While this measure is informative following confirmatory factor analyses; construct reliability is not a critical test of the reliability of the instrument for at least two reasons: (1) the instrument was not designed with the intent that items map onto a set of underlying constructs that were hypothesized a priori, and (2) the items measure behavior, unlike typical psychometric applications that measure psychological phenomena. One consequence of the first limitation is that there are unequal numbers of items across the latent dimensions of the scale. Some constructs, such as the information technology factor in the MBF, have only a small number of items measuring that construct. A paucity of items on a latent construct penalizes the alpha value; in contrast, alpha values increase as a function of the number of items and can in fact inflate alpha values for constructs with larger numbers of items. Thus, alpha values represent dimensions other than the strength of the relationship between items. The second limitation to using Cronbach's alpha for measuring CCSR constructs is the nature of the outcomes for frequency data. Scale construction intended to maximize Cronbach's alpha pose questions across all items within a construct with the goal of making them as similar as possible, in contrast to frequency of engagement behaviors that are inherently variable in the frequency with which they occur. Frequencies of distinct behaviors measured on the CCSR are inherently variable in the frequency that students can be expected to engage in these activities. For example, talking to professors after class and studying are both regarded as educationally meaningful activities; however, there is a physical limitation to the opportunities that students have to talk with professors after class in contrast to the number of students who can study on a daily basis. Thus, the measurement of behavior diverges from traditional uses of Cronbach's alpha which assume that each item comprising a construct should be similar in value and thus makes an equivalent contribution to an underlying dimension. Despite the limitations of Cronbach's alpha with the CCSR, the latent constructs showed reasonable construct reliability and certainly did not identify items that were inappropriate for the construct with which they were associated.

Validation analyses focused on GPA as an outcome and consistently demonstrated a strong positive relationship between latent constructs and GPA. The validation models reflect the relationship between engagement and GPA, controlling only for institutional and year-to-year differences in survey administrations. One notable exception to the positive relationship between GPA and engagement constructs was in the factors comprised largely of student services, a factor that has been associated with retention in previous research (Chaney et al., 1998). An explanation for the lack of effect attributable to this construct is the possibility that student services are not always directly related to learning. Another possibility is that student services are used more heavily among students with special needs who, as a group, have lower GPAs. As with all the validation analyses, the possibility that this effect is moderated by characteristics of subpopulations deserves additional research. While the CCSR has several items independent of the latent constructs, there is a possibility of a positive response bias whereby students who feel that they are gaining academically have inflated perceptions of their engagement behaviors. GPA is the single measure of students' academic achievement on the CCSR survey that does not rely on students' self-perceptions and thus avoids the possibility that results are explainable due to a positive response bias. As a widely used measure in nearly all institutions of higher education, it can reasonably be assumed to be a gross measure of how much students are learning in their academic endeavors. Thus, GPA was used as the outcome in validation analyses. There are undoubtedly other factors that predict GPA and factors that both mediate and moderate the relationship between GPA and engagement constructs. While subsequent research should pursue those mediating and moderating factors and examine the relationship between engagement areas, the goal of the current models is not to estimate the amount of unique variance in GPA explained by engagement, but to merely establish that this relationship exists. To adequately understand the relationship between engagement and outcomes, incorporating factors beyond those measured on the CCSR will be required.

Reliability and validity analyses provide supporting evidence that the CCSR is effectively measuring student engagement. The CFA models consistently demonstrated measurement invariance across major subgroups and administration years, supporting the use of the instrument across a variety of populations and across time. Validity analyses based on students' reported GPAs show that the behaviors and attitudes measured on the CCSR are predictably associated with academic achievement.

### *Implications for Future Research*

The latent constructs presented here provide a framework for examining the engagement behaviors believed to be critically influential in student success in the two-year sector. The latent constructs also provides an opportunity to empirically assess models of student change that have been developed in the four-year sector in terms of their relevance and applicability to two-year institutions. An immediate need for future research is the extension of the validation analyses; there are numerous outcomes other than GPA that are likely to be linked to the constructs developed herein. Those include successful course completion (grade of C or better), within-semester retention, semester-to-semester retention, and graduation. Each of these outcome measures should also be examined with regard to the moderating effects of student characteristics, such as socioeconomic status, race/ethnicity, developmental needs, and educational goals.

The need for research on students in the community college sector that replicates findings from the four-year sector is highlighted by at least three salient differences between two- and four-year sectors: community colleges serve extensive developmental educational needs, there is a often wider range of educational programs than are offered at four-year institutions, and measures of student success in two-year institutions are less straightforward. The extensive developmental needs of students in the two-year sector suggests that there is a substantial portion of students functioning below college level in core academic areas that are unlikely to be well represented in research conducted with students in four-year colleges. The wider range of educational programs offered at two-year colleges includes not only remedial education and courses comprising the first two years of a baccalaureate, but also technical, vocational, and certification programs that traditionally are not offered at four-year institutions. In addition, a growing number of baccalaureate degree holders are returning to community colleges to obtain job-related skills. Thus, community colleges attract students with a wide range of academic and career goals. A related point is that measuring successful educational attainment is complicated in the two-year sector by the variety of reasons students have for attending community and technical colleges, a form of diversity that creates difficulties in defining what a desired educational outcome is. A baccalaureate degree is overwhelmingly the goal of college students in four-year institutions in contrast to the two-year sector, where students' goals may be a certificate rather than an Associate degree, or their end goal may be a four-year degree that is only attainable elsewhere. In summary, developmental education needs, program diversity, and diverse academic goals are three salient factors that differ between two- and four-year institutions, but by no means are these factors a comprehensive list of the differences. In addition to demographic factors such as racial compositions, age, socio-economic status, and parental education, there are likely many psycho-social differences that are not as easily observable as the factors noted above.

There are also numerous differences in the four-year and two-year college environments that suggest that a critical examination of applicability of research conducted in the four-year sector is needed in order to apply those findings to the two-year sector. Many of the social opportunities provided by four-year institutions may not be available to students in many two-year environments, where there is typically less institutional infrastructure for such activities. Indeed, theoretical perspectives that emphasize the importance of these factors and have relatively good fit for four-year institutions may not be relevant to retention in two-year colleges (Braxton et al., 2004). Two-year institutions typically support only a fraction of the clubs, athletic programs, fraternities, and sororities that are common at four-year institutions. On-campus living is also far less common. While the institutional infrastructure that supports student engagement in the four-year sector is often lacking in the two-year sector, this does not lead to the conclusion that there is less opportunity for student engagement in the two-year sector. Rather than assuming the same mechanisms that establish opportunities for engagement in four-year institutions are relevant on two-year campuses, researchers should look for alternative social structure, interpersonal support, and informal communities that may foster student engagement and academic success.

### *Conclusions*

Without significant contributions of research that has been conducted with students at two-year institutions, the study of student engagement in higher education is systematically biased towards an understanding of student engagement at four-year institutions. The analyses presented herein demonstrate that the psychometric properties of the CCSR and constructs derived from the instrument are both reliable and valid. Thus having established the CCSR as a reliable and valid tool for the study of student engagement in the two-year sector, the instrument provides a tool for remedying the de facto bias towards an understanding of four-year students that currently exists in the literature on student engagement. The numerous differences between the two- and four-year sectors suggest a need to investigate the extent to which models of student involvement and student effort developed in the four-year sector are applicable to the two-year sector.

CCSSE survey results are currently used by community college practitioners in various levels of administration and by faculty members. Its uses include institutional planning, accreditation assessments, and faculty and staff development. Establishing the reliability and validity of the constructs situates the meaning of the latent constructs, thus defining the relevance of survey results with regard to decision making. Beyond campus-wide assessments, the instrument can be used to identify the needs and special circumstances of targeted groups of students. Furthermore, continued research conducted with the CCSR will inform institutional decision-making with regard to teaching practices, campus design, institutional culture, and decisions in other areas.

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Table 1

Comparison of the CCSSE Samples to Their Underlying Population

| Demographic | CCSSE 2003 Sample | CCSSE 2003 Population | CCSSE 2004 Sample | CCSSE 2004 Population | CCSSE 2005 Sample | CCSSE 2005 Population |
|---|---|---|---|---|---|---|
| Sex | | | | | | |
| Male | 40% | 42% | 40% | 41% | 39% | 41% |
| Female | 60% | 58% | 60% | 59% | 61% | 59% |
| Race | | | | | | |
| American Indian or other Native American | 2%[a] | 1% | 2% | 1% | 2% | 1% |
| Asian, Asian American or Pacific Islander | 3%[a] | 4% | 4% | 5% | 2% | 4% |
| Black or African American, Non-Hispanic | 9%[a] | 12% | 10% | 14% | 12% | 14% |
| White, Non-Hispanic | 66%[a] | 63% | 61% | 59% | 68% | 65% |
| Hispanic, Latino, Spanish | 8%[a] | 13% | 13% | 15% | 8% | 11% |
| Other | 5%[a] | 5% | 3% | 4% | 3% | 4% |
| International Student or Foreign National | 7%[a] | 2% | 7% | 2% | 5% | 2% |
| Age | | | | | | |
| 18 to 19 | –[b] | 20% | 27% | 21% | 26% | 22% |
| 20 to 21 | –[b] | 18% | 23% | 18% | 23% | 18% |
| 22 to 24 | –[b] | 15% | 14% | 15% | 14% | 15% |
| 25 to 29 | –[b] | 14% | 12% | 14% | 13% | 14% |
| 30 to 39 | –[b] | 16% | 13% | 16% | 13% | 17% |
| 40 to 49 | –[b] | 10% | 8% | 10% | 8% | 10% |
| 50 to 64 | –[b] | 5% | 3% | 4% | 3% | 4% |
| 65 and over | –[b] | 1% | <1% | 1% | <1% | 1% |
| Enrollment Status | | | | | | |
| Full - Time | 66% | 38% | 66% | 37% | 69% | 40% |
| Part - Time | 34% | 62% | 34% | 63% | 31% | 60% |

[a]The 2003 version of the survey allowed respondents to select more than one race. Responses were recoded so that respondents selecting more than one race were treated as 'Other.' [b]The 2003 version of the survey used age categories inconsistent with the 2004 and 2005 survey. The distribution of ages in 2003 survey respondents is as follows: 7% 18 years old; 45% 19 to 22 years old; 12% 23 to 25 years old; 9% 26 to 29 years old; 14% 30 to 39 years old; 9% 40 to 49 years old; 3% 50 to 59 years old; and 1% 60 years old or older.

Table 2

Reliability Measures

| Latent Construct | Alpha | Test-Retest *r* |
|---|---|---|
| MEEP | | |
| Active and Collaborative Learning | .66 | .73 |
| Student Effort | .56 | .74 |
| Academic Challenge | .80 | .77 |
| Student-Faculty Interaction | .67 | .73 |
| Support for Learners | .76 | .73 |
| MBF | | |
| Faculty Interactions | .73 | .72 |
| Class Assignments | .65 | .68 |
| Exposure to Diversity | .73 | .70 |
| Collaborative Learning | .60 | .67 |
| Information Technology | .59 | .69 |
| Mental Activities | .83 | .73 |
| School Opinions | .78 | .73 |
| Student Services | .65 | .61 |
| Academic Preparation | .56 | .76 |

Table 3

Summary of MBF HLM Models

| Factor | Institution-level Coefficient | Institution-level S.E. | Person-level Coefficient | Person-level S.E. |
|---|---|---|---|---|
| Faculty Interactions | 0.88* | 0.43 | 0.96*** | 0.03 |
| Class Assignments | -0.43 | 0.28 | 0.26*** | 0.01 |
| Exposure to Diversity | -1.09*** | 0.27 | 0.30*** | 0.02 |
| Collaborative Learning | -0.15 | 0.46 | 0.46*** | 0.03 |
| Information Technology | -0.59*** | 0.05 | 0.22*** | 0.00 |
| Mental Activities | 0.06 | 0.39 | 0.80*** | 0.02 |
| School Opinions | 0.06 | 0.09 | 0.09*** | 0.02 |
| Student Services | -0.12 | 0.06 | -0.21*** | 0.01 |
| Academic Preparation | -1.38** | 0.47 | 0.43*** | 0.02 |

Table 4

Summary of MEEP HLM Models

| Factor | Institution-level Coefficient | Institution-level S.E. | Person-level Coefficient | Person-level S.E. |
|---|---|---|---|---|
| Active and Collaborative Learning | 0.24 | 0.64 | 1.05*** | 0.04 |
| Student Effort | -0.96 | 0.64 | 0.59*** | 0.01 |
| Academic Challenge | -1.22** | 0.42 | 0.81*** | 0.03 |
| Student-Faculty Interaction | 0.49 | 0.30 | 0.60*** | 0.03 |
| Support for Learners | 0.36*** | 0.09 | 0.03 | 0.03 |

**Appendix A**

***Questions, Response Values, and Standardized Coefficients for Items in MBF and MEEP CFA Model***

| Item and Scale | MBF | MEEP |
|---|---|---|
| College Activities (*Never, Sometimes, Often, Very Often*) | | |
| Asked questions in class or contributed to class discussions | Faculty Interactions (.44) | Active and Collaborative Learning (.46) |
| Made a class presentation | Class Assignments (.51) | Active and Collaborative Learning (.47) |
| Prepared two or more drafts of a paper or assignment before turning it in | Class Assignments (.62) | Student Effort (.58) |
| Worked on a paper or project that required integrating ideas or information from various sources | Class Assignments (.76) | Student Effort (.62) |
| Come to class without completing readings or assignments | | Student Effort (.07) |
| Worked with other students on projects during class | Collaborative Learning (.53) | Active and Collaborative Learning (.49) |
| Worked with classmates outside of class to prepare class assignments | Collaborative Learning (.66) | Active and Collaborative Learning (.57) |
| Tutored or taught other students (paid or voluntary) | Collaborative Learning (.48) | Active and Collaborative Learning (.43) |
| Participated in a community-based project as a part of a regular course | Collaborative Learning (.44) | Active and Collaborative Learning (.41) |
| Used the Internet or instant messaging to work on an assignment* | Information Technology (.64) | |
| Used email to communicate with an instructor | Information Technology (.65) | Student-Faculty Interaction (.42) |
| Discussed grades or assignments with an instructor | Faculty Interactions (.63) | Student-Faculty Interaction (.63) |
| Talked about career plans with an instructor or advisor | Faculty Interactions (.66) | Student-Faculty Interaction (.65) |
| Discussed ideas from your readings or classes with instructors outside of class | Faculty Interactions (.66) | Student-Faculty Interaction (.66) |
| Received prompt feedback (written or oral) from instructors on your performance | Faculty Interactions (.47) | Student-Faculty Interaction (.47) |
| Worked harder than you thought you could to meet an instructor's standards or expectations | Mental Activities (.42) | Academic Challenge (.45) |
| Worked with instructors on activities other than coursework | Faculty Interactions (.48) | Student-Faculty Interaction (.49) |

| | | |
|---|---|---|
| Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.) | Exposure to Diversity (.44) | Active and Collaborative Learning (.48) |
| Had serious conversations with students of a different race or ethnicity other than your own | Exposure to Diversity (.84) | |
| Had serious conversations with students who differ from you in terms of their religious beliefs, political opinions, or personal values | Exposure to Diversity (.85) | |
| Mental Activities (*Very little, Some, Quite a Bit, Very Much*) | | |
| Analyzing the basic elements of an idea, experience, or theory | Mental Activities (.71) | Academic Challenge (.70) |
| Synthesizing and organizing ideas, information, or experiences in new ways | Mental Activities (.78) | Academic Challenge (.77) |
| Making judgments about the value or soundness of information, arguments, or methods | Mental Activities (.73) | Academic Challenge (.71) |
| Applying theories or concepts to practical problems or in new situations | Mental Activities (.77) | Academic Challenge (.75) |
| Using information you have read or heard to perform a new skill | Mental Activities (.66) | Academic Challenge (.65) |
| Academic Preparation (*None, Between 1 and 4, Between 5 and 10, Between 11 and 20, More than 20*) | | |
| Number of assigned textbooks, manuals, books, or book-length packs of course readings | Academic Preparation (.55) | Academic Challenge (.27) |
| Number of books read on your own (not assigned) for personal enjoyment or academic enrichment | | Student Effort (.21) |
| Number of written papers or reports of any length | Academic Preparation (.59) | Academic Challenge (.26) |
| Exams (*Responses range from 1 to 7, with scale anchors described: (1) Extremely easy (7) Extremely challenging*) | | |
| Mark the box that best represents the extent to which your examinations during the current school year have challenged you to do your best work <u>at this college</u> | Academic Preparation (.35) | Academic Challenge (.34) |
| Opinions about Your College (*Very little, Some, Quite a bit, Very much*) | | |
| Encouraging you to spend significant amounts of time studying | School Opinions (.45) | Academic Challenge (.42) |
| Providing the support you need to help you succeed at this college | School Opinions (.62) | Support for Learners (.60) |
| Encouraging contact among students from different economic, social, and racial or ethnic backgrounds | School Opinions (.67) | Support for Learners (.65) |
| Helping you cope with your non-academic responsibilities (work, family, etc.) | School Opinions (.75) | Support for Learners (.76) |
| Providing the support you need to thrive socially | School Opinions (.79) | Support for Learners (.81) |
| Providing the financial support you need to afford your education | School Opinions (.45) | Support for Learners (.45) |

| | | |
|---|---|---|
| Time Allotment (*None, 1-5 hours, 6-10 hours, 11-20 hours, 21-30 hours, More than 30 hours*) | | |
| Preparing for class (studying, reading, writing, rehearsing, doing homework, or other activities related to your program) | Academic Preparation (.49 ) | Student Effort (.39) |
| Student Services (*Don't Know/N.A., Rarely/never, Sometimes, Often*) | | |
| Frequency: Academic advising/planning | Student Services (.63) | Support for Learners (.35) |
| Frequency: Career counseling | Student Services (.62) | Support for Learners (.34) |
| Frequency: Peer or other tutoring | Student Services (.51) | Student Effort (.33) |
| Frequency: Skill labs (writing, math, etc.) | Student Services (.52) | Student Effort (.34) |
| Frequency: Computer lab | Student Services (.37) | Student Effort (.32) |