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Student engagement scale: Development and the underlying factor structure

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STUDENT ENGAGEMENT SCALE: DEVELOPMENT AND THE UNDERLYING FACTOR STRUCTURE

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ABSTRACT

Student engagement is a multidimensional construct with behavioral, affect, and cognitive domains. For this study, a student engagement scale was developed that encompassed behavioral, affect, and cognitive domains as well as five-target factors, including class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities. The underlying factor structure of the Student Engagement Scale was also assessed. A three-factor model (behavioral, affect, and cognitive), five-factor model (class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities), and eight-factor nested model (both three-domains and five-target factors) were tested using both exploratory and confirmatory analyses. Confirmatory factor analyses demonstrated that an eight-factor model of the Student Engagement Scale best fit the data, indicating that Student Engagement Scale contains items that reflect behavioral, affect, and cognitive domains as well as class participation, relationship with faculty, relationship with

peers, participations in campus activities, and utilization of campus facilities.

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CHAPTER ONE

INTRODUCTION

The concept of student engagement has received increased attention as a possible means of reducing student dropout rates, increasing motivation, and raising overall academic achievement levels (Fredricks, Blumfield, & Paris, 2004). Generally, student engagement can be defined as a student's involvement in educational activities, such as attending class, completing course work, and participating in extra-curricular activities. High levels of student engagement have been linked to higher rates of retention and higher levels of academic achievement (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Laird, Chen, & Kuh, 2008). Given the strong effects attributed to student engagement on a range of educational issues, the need for a scale to measure the construct of student engagement is great and is the purpose of this study. The task of constructing a reliable and valid student engagement scale has proven to be a difficult task given the complexity of the construct.

Engagement a Multidimensional Construct

The complexity of the student engagement construct is noted in the various domains used to measure the construct. Some of the domains that have been examined relate to the student level and others to the institutional level. Fredricks, Blumenfeld and Paris' (2004) review of the student engagement literature indicated student engagement consists of behavioral, affective and cognitive domains. Behavioral engagement is typically defined as participation either in class or academic and extracurricular activities. According to Fredricks, Blumenfeld and Paris (2004), behavioral engagement has been a critical component of academic outcomes and maintaining enrollment (retention). Affective engagement typically consists of individuals' positive and negative emotions regarding school, teachers, and peers. It has been theorized that emotional engagement is a critical component in creating ties to an academic institution (Fredricks et al., 2004). Cognitive engagement is typically defined as individuals' persistence, beliefs and self-perceptions regarding learning, as well as planning, investing and self-regulating. Additionally, Fredricks et al. (2004) noted research on school-level factors, specifically within a classroom context such as

teacher support, relationships with peers, classroom structure, autonomy support, and task characteristics, have been found to be associated with behavioral, affective, and cognitive engagement.

Jimerson, Campus, and Greif's (2003) review of the student engagement literature also identified behavioral, affective, and cognitive dimensions of student engagement. In addition, Jimerson et al. (2003) classified items used to measure student engagement into five contexts, based on a review of 45 studies. The first context identified was academic performance, which consisted of items relating to grades, achievement tests, hours studying, and completion of assignments. The second context identified was classroom behaviors, which consisted of items relating to asking questions, attending class, and general classroom behavior. The third context was extracurricular activity, which consisted of items relating to the frequency of participation in sports or other school activities. The fourth context was interpersonal relationships, which consisted of items relating to relations with peers and teachers. The last context identified was school community, which consisted of items relating to feelings and attitudes toward the school.

Appleton, Christenson, and Furlong's (2008) review of the engagement literature provided concurring evidence for the behavioral, affective, and cognitive domains. Appleton, et al. (2008) noted researchers who have used a two-dimension model of student engagement have typically used behavioral and an affective dimension, but not typically a cognitive dimension.

The complexity of the student engagement construct is not only seen in the variety of proposed components of student engagement. It is also evident in the lack of consensus on a definition for student engagement. Appleton et als. (2008) review of the engagement literature identified nineteen definitional variations of student engagement. Jimerson et al. (2003) also noted terms related to school engagement have been used interchangeably and include school engagement, belonging, school community, affiliation, school membership, and motivation. A potential reason for the lack of consensus on a definition of student engagement may be related to the lack of common terminology. The need for definitional clarity is critical for the purposes of generalizability. Despite conceptual and definitional differences of student engagement, there is strong empirical evidence connecting student engagement,

broadly defined, with academic achievement and drop-out rates at both the high school and college level and are consistent across ethnic groups (Janosz, Archambault, Morizot, & Pagoni, 2008; South, Haynie & Bose, 2007; Ream & Rumberger, 2008; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Laird, Chen & Kuh, 2008).

Pre-existing Student Engagement Measures

Appleton et al. (2008) noted current student engagement measures/questionnaires focus heavily on observable indicators related primarily to behavioral engagement, and tend to ignore cognitive engagement. Paris et al. (2004) noted engagement has been studied using scales which measure a single domain (i.e., either behavioral, affect or cognitive) or a combination of two or more domains. One problem noted with scales containing multiple domains according to Paris et al. (2004) is that "most of the self-report measures of behavioral, emotional and cognitive engagement do not specify subject areas" and "measures are rarely attached to specific tasks and situations, instead yielding information about engagement as a general tendency".

Only two college engagement scales were found, and one was not related to student engagement to the university as a whole but rather to a specific course. The class specific scale was the Student Course Engagement Questionnaire (SCEQ) developed by Handelsman, Briggs, Sullivan, and Towler (2005). The questionnaire was constructed to measure engagement in specific lower division college courses and not engagement to a university as a whole. A course-specific engagement scale is limited in applicability and usage such that only students in a specific course could be measured. The psychometric properties of the SCEQ include four factors: skills engagement, emotional engagement, participation/interaction engagement, and performance engagement. The final version of the SCEQ contained twenty-three items. Because the literature identifies engagement more broadly than just classroom engagement, the purpose of this study was to create a scale of student engagement that would encompass behavioral, affect, and cognitive engagement as well as engagement in the classroom, with faculty, with peers, participation in campus activities, and utilization of campus facilities.

The National Survey of Student Engagement, NSSE, also a college student engagement scale, is administered in universities/colleges nationwide. Psychometric properties of the NSSE include eight scales: levels of academic challenge, active and collaborative learning, student faculty interaction, enriching educational experiences, supportive campus environment, general educational gains, practice competence gains, and personal social gains. The NSSE has approximately seventy items. It is unclear how, or if, the behavioral, affect, and cognitive domains of engagement are represented in this scale. The scale, although widely used by universities, is not practical given that there is a fee to administer the NSSE, with varying cost based on format of administration and the scale is not in the public domain. An additional goal with the thesis was in developing a shorter scale of student engagement and making it publicly available for research purposes.

The literature shows that student engagement is multidimensional with behavioral, affective and cognitive domains and that these domains are expressed in specific interactional targets. The existing scales do not address the structure of student engagement in this manner.

Therefore a scale that is easily available (and free) to measure the multidimensional construct of college level student engagement is needed and is the purpose of this study. The scale to be created in this study incorporates all three domains into a single measure, providing a more comprehensive look into student engagement. To correct for the problem of a lack of target or source engagement, not only would behavioral, affective and cognitive domains be included in the scale, but target-factors nested in all three domains would be included. The target-factors included were: 1) class participation, 2) relationship with faculty and staff, 3) relationship with peers, 4) campus participation and 5) utilization of campus facilities.

CHAPTER TWO

SCALE DEVELOPMENT

The goal of the thesis was to create a reliable student engagement scale which incorporated behavioral, affective, and cognitive domains as well as target-factors relating to engagement in class, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities. In essence, the overall domains of behavior, affect, and cognition would be represented in all target-factor items. Given the inconsistency and/or vagueness of student engagement definitions, the researcher explicitly defined engagement as consisting of three domains - behavioral, affect, cognitive, with five target - factors that make up the domains - class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of facilities.

Methods

The initial scale development consisted of developing a pool of potential scale items dictated by the student engagement definition stated above. Items included in the scale were behavioral, affect, and cognitive items. For

example, a behavioral item included was "I attend scheduled class meetings on a regular basis," an affect item included was, "I enjoy participating in group activities during class time," and a cognitive item included was "I believe current class work will give me skills to succeed in future classes." Items related to the target-factors included class meetings, relationship with university faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities were included within each domain. Once the scale items were written, they were reviewed by subject matter experts (SMEs) to assess whether they truly represented the appropriate dimensions. Graduate students in an advanced measurement course at California State University San Bernardino were given the items and asked to identify whether they were: behavioral, affect, or cognitive items. Additionally, the students were asked to identify whether the items pertained to: classroom participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities. SMEs provided a strong consensus and agreed the items were written and identified appropriately by the researcher. For behavioral items, students were

asked to rate how often they engaged in school activities on a five-point Likert scale, from 1 (never) to 5 (always). For affective and cognitive items, students were asked to rate how often they agreed with statements on a five-point Likert scale, from 1 (completely disagree) to 5 (completely agree). The behavioral domain contained sixteen items, the affect domain contained sixteen items, and the cognitive domain contained fifteen items. The class participation target factor contained ten items, relationship with faculty and staff contained nine items, relationship with peers contained eleven items, participation in campus activities contained eight items, and utilization of campus facilities contained nine items.

CHAPTER THREE

STUDY ONE

The goal of this study was to examine the internal consistency and the underlying factor structure of the Student Engagement Scale using Cronbach's Alphas, exploratory analyses, and confirmatory factor analyses. A second goal of the study was to create a short form of the student engagement scale, which originally contained forty-seven items.

Methods

Participants

Data was collected over the course of one year, from the winter 2008 quarter to the fall 2008 quarter. Participants were students who participated in the Gateway program at CSUSB and freshman students who were not in the Gateway program. Data from the winter, spring, and fall 2008 quarters were used for analyses. The spring 2008 dataset was used for all the exploratory analyses. The winter 2008 and fall 2008 datasets were merged and used for all the confirmatory analyses. For the winter 2008, the mean age of participants was 18.5 years. 72.6% of the sample was female and 27.4% of the sample was male. The

majority of students identified themselves as Mexican or Mexican-American (41.9%), followed by other Hispanic or other Latino (19.1%) and Black or African-American (18.8%). A large majority of students reported living with their parents (62%) followed by campus housing (26.6%).

For the spring 2008, the mean age of participants was 18.62 years. 82.2% of the sample was female and 17.8% of the sample was male. The majority of students identified themselves as Mexican or Mexican-American (42.4%) followed by Hispanic or other Latino (18.8%) and Black or African American (18.2%). A large majority of students reported living with their parents (67.8%) followed on campus housing (21.6%).

For the fall 2008, the mean age of participants was 18.18 years. 72.3% of the sample was female and 27.7% of the sample was male. 46.8% of students identified themselves as Mexican or Mexican-American, 18.3% of students identified themselves as Black or African-American, and 12.8% of students identified themselves as Hispanic or other Latino.

Materials

Students completed the Student Engagement Scale on-line. The Student Engagement Scale consisted of forty-

seven items. Aside from the Student Engagement Scale, students were asked to provide demographic information, including gender, age, ethnicity, and living arrangements. For the Student Engagement Scale, students were asked to rate the frequency of behaviors on a five-point Likert scale, from one (never) to five (always). For affect and cognitive items, students were asked to rate how often they agreed on a five-point Likert scale, from one (completely disagree) to five (completely agree).

Overview of Analyses

After evaluation of statistical assumptions and missing data, inter-item correlations and exploratory factor analysis were used to create a short form of the student engagement scale. Items which correlated highly with each other, greater than .90, were removed (Tabachnick & Fidell, 2007). Using exploratory factor analysis, it was elected that items with factor loadings less than .50 (no less than 25% of the variance in the item explained by the factor) would be removed. To examine the underlying factor structure, confirmatory factor analysis through structural equation modeling was used to test three models. A three domain structured was tested first (behavioral, affect, and

cognitive), followed by a five target-factor structure (class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus resources). Lastly, an overall model was tested to see if the five target-factors were nested within the behavioral, affective, and cognitive domains. Refer to diagrams one, two, and three in the Appendix B.

The two analyses were conducted in the two datasets separately. The smaller spring 2008 dataset was used primarily as a developmental, exploratory sample. The merged winter 2008 and fall 2008 dataset was used to confirm the results of the first set of analyses.

Results for Developmental Models

For the smaller spring 2008 dataset, there were a total of 171 cases. Using the Descriptives function in SPSS, all 45 items had missing cases; however no items had more than 5% missing data. Given that there were no significant patterns of missing data, the data were classified as missing completely at random.

Skewness, kurtosis, and univariate outliers were assessed using a *Z*-score value of $\pm$ 3.3, $p < .001$. Seven

items were identified as being negatively skewed, with *Z*-scores values ranging from -5.39 to -3.61. Four variables were identified as kurtotic, with *Z*-scores ranging from -4.05 to -3.41. There were no univariate outliers. Multivariate outliers were assessed using a critical χ^2 = 80.08, df = 47, p <.001. Three multivariate outliers were identified, with χ^2 values ranging from 81.27 to 85.72.

The EM Algorithm method of data imputation was used given that there were no significant patterns of missing data. After imputing the data, skewness, kurtosis, outliers, and multivariate outliers were reassessed. The same skewed variables identified before data imputation was still skewed after data imputation, with the addition of an eight variable, item "what I am learning now will help me in future classes". The skewness of each variable was slightly higher after data imputation. Skewness values ranged from -5.51 to -3.69. Kurtosis of each variable was slightly lower after data imputation, with values ranging from -4.05 to -3.41. There were no univariate outliers. There were five multivariate outliers identified. For a listing of descriptive statistics for all items, refer to table one in Appendix A. For a listing of skewed variables

refer to table three in Appendix A. The five multivariate outliers were deleted, leaving a total of 166 cases for the analyses.

Reliability

To assess the internal consistency of the Student Engagement Scale, Cronbach's Alphas were conducted on the smaller spring 2008 dataset. Cronbach's alphas for the five target factors: class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities were conducted. Cronbach's alphas were also conducted for the three domains: behavioral, affect, and cognitive.

The class participation target factor had ten items, with a reliability value of .87. A check of the inter-item correlations showed that the two highest correlated items were: "I voluntarily answer questions when they are posed to class" and "I participate in class discussion", (r = .77). The item-total statistics showed that by removing the item "I attend scheduled class meetings on a regular basis" reliability would improve from .89 to .87. Removing any other item would decrease reliability to as low as .85. Given that the initial reliability value of .87 was sufficient, all items were retained.

The relationship with faculty/staff target factor had nine items, with a reliability value of .88. The items, "I feel comfortable asking my professors to clarify course information", and "I feel comfortable approaching my professors with questions regarding course work" correlated the highest, r = .88. There were no correlations greater than .80. Item-total statistics showed that removal of any variable would not improve reliability; however removal of any variable would decrease reliability to as low as .86. Given that the initial reliability value of .88 was sufficient, all items were retained.

The relationship with peers target factor contained eleven items, with a reliability value of .94. A check of the inter-item correlations showed that the highest correlation was r = .82, between items, "I meet with my classmates off campus to socialize" and "I meet with my classmates outside of class, on campus, to study together". Item-total statistics indicated that removal of any variable would not improve reliability; however removal of any items would decrease reliability to as low as .93. All items were retained.

The participation in campus activities target factor contained eight items, with a reliability value of .94.

The items, "I think that being involved in campus clubs, organizations, and/or recreational activities will make me a more well-rounded student", and "I feel that being involved in campus clubs, organizations, and/or recreational activities enhances my experience at CSUSB" were strongly correlated, r = .92. These two items appeared to be asking the same thing. The correlation between these two items exceeded the criteria of .90 or greater (Tabachnick & Fidell, 2005). The item "I feel that being involved in campus clubs, organizations, and/or recreational activities enhances my experience at CSUSB" was dropped. Removal of this item reduced the factor reliability from .96 to .94; however the value of .94 far exceeded the reliability criteria of .70 (Shultz & Whitney, 2003).

The utilization of campus facilities target factor contained nine items, with a reliability value of .81. The strongest inter-item correlation was between items "I feel that this campus is accommodating to the needs of all students" and "I think the library has good print resources available for my use", r = .68. Removal of the item "I take advantage of the gym and recreational center at CSUSB" would increase reliability from .81 to .83. Removal of the

item, "I feel that this campus is accommodating to the needs of all students", would decrease reliability to .78. Ultimately, all items were retained.

Reliability analyses were also conducted for the three domains, behavioral, affect, and cognitive. The behavioral domain contained sixteen items, with a Cronbach's alpha of .91. Removal of the item "I attend scheduled class meetings on a regular basis" would improve reliability to .92.

The Affect domain contained sixteen items, with a Cronbach's alpha of .90. Removal of any item would not increase reliability. The cognitive domain contained fifteen items, with a Cronbach's alpha of .90. Removal of any item would not increase reliability. All items were retained for the behavioral, affect, and cognitive domains.

Exploratory Analyses

The primary goal of the exploratory factor analysis (EFA) was to eliminate items from the scale by means of eliminating low factor loadings. A second goal EFA was to screen and detect items that were not functioning well in the context of a factor model. The complex factor structures proposed in this study were not tested at this step. EFAs were conducted using the smaller spring 2008

dataset. EFAs were conducted was using multiple factor solutions. Principal axis factor extraction as well as direct oblimin rotation was used for all solutions. Items that loaded less than .50 were eliminated. Refer to table five in Appendix A. The analyses did confirm that items were functioning well in the context of a factor structure. The three-factor solution was deemed the better factor structure as it was the most interpretable solution. It also contained factors that were consistent with the hypothesized behavioral, affect and cognitive domains and the class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities target factors. The first factor contained items relating to thoughts and feelings regarding school (affect and cognition domains) such as: "I feel my professors interact with me in a professional manner", and "the classes I have taken so far met my expectation about what I thought college would be like". The second factor contained items relating to involvement or participation in school activities - a combination of participation in campus activities and relationship with faculty target factors. Items such as: "I am involved in organizing events and

activities on campus, such as club meetings, colloquiums, banquets, movie nights, etc.", and "I take advantage of the gym and recreational center at CSUSB" were included in the second factor. The third factor contained items relating to relationships with peers, such as: "I meet with my classmates, on campus, to study together" and "Meeting with my classmates makes attending CSUSB more enjoyable".

Given that exploratory factor analysis was not appropriate for testing the hypothesized factor structures, preliminary confirmatory factor analyses were conducted (Ullman, 2006). The confirmatory factor analysis, based on the smaller spring 2008 dataset, was performed through structural equation modeling procedures using EQS 6.1. The hypothesized models are presented in figures one, two and three in Appendix B, where circles represent latent variables and rectangles represent measured variables. Absence of a line connecting variables implied no hypothesized direct effect. Eight-factor (three domains and five target-factors), three-factor (domains only), and five-factor models (target-factors only) of student engagement were examined through a series of nested models. The goal was to statistically assess which model best fit the structure of the student engagement scale. The three-

domains were hypothesized to covary with one another and the five target-factors were hypothesized to covary with one another. Covariances between the target and domain factors were set to zero. Refer to figures four and five in Appendix B.

Mardia's Normalized coefficient = 228.48, $p<.001$ indicating violation of multivariate normality. Given the non-normality of these variables, ML estimation and the Satorra-Bentler scaled chi-square test statistic was employed (Sattora & Bentler, 1988, 1994). The standard errors were adjusted to the extent of the non-normality (Bentler & Dijkstra, 1985). The models were evaluated with χ^2 as well as the CFI and RMSEA. Values greater than .95 for the CFI and less than .06 for the RMSEA indicate good-fitting models (Hu & Bentler, 1998, 1999; Steiger & Lind, 1980).

There was no support for the hypothesized three-factor model, Satorra-Bentler χ^2 (557, N = 166) = 2152.53, $p<.01$, Robust CFI = .58, RMSEA = .13. The CFI was less than .95 and the RMSEA was greater than .06, indicating a weak fitting model. There was also no support for the hypothesized five-factor model, Satorra-Bentler χ^2 (550, N = 166) = 1565.46, $p<.01$, Robust CFI = .73, RMSEA = .10.

There was marginal support for the eight-factor model however, Satorra-Bentler χ^2 (512, N = 166) = 976.95, $p<.01$, Robust CFI = .88, RMSEA = .07. To provide evidence that the eight factor model was the better fitting model when compared to the three and five factor models, the Satorra-Bentler chi-square difference test was used (Satorra, 2000; Satorra & Bentler, 2001). In comparing the three factor model and the eight factor model, Satorra-Bentler $\chi^2_{\text{difference}}$ (46, N = 166) = 1215.19, $p<.01$, providing evidence that the eight factor model fit the data better. In comparing the five factor and eight factor model, Satorra-Bentler $\chi^2_{\text{difference}}$ (39, N = 166) = 562.42, $p<.01$, providing evidence that the eight factor model fit the data better. Refer to table six in Appendix A.

Post-hoc model modifications on the eight-factor model were performed in an attempt to develop a better fitting model. Using the Lagrange multiplier, and theoretical relevance, five pairs of residual covariances were estimated[1]. The model was significantly improved with the

[1] Order of residual covariance paths added were: 1. I feel comfortable asking my professor to clarify course information and I feel comfortable approaching my professors with questions regarding course work. 2. Even when no questions, I attend faculty office hours and when I have questions I attend office hours. 3. Meet with classmates off campus to socialize & meet with my classmates on campus to socialize. 4. Admire my surroundings when I walk through campus and I

addition of these paths, Satorra-Bentler χ^2 difference (5, N = 166) = 396.29, $p<.01$, Robust CFI = .93, RMSEA = .06. There were several path coefficients that were not significant[2]; however all other paths were significant. Non-significant paths were dropped and the eight-factor model was re-estimated, Satorra-Bentler χ^2 (517, N = 166) = 800.10, $p<.01$, Robust CFI = .93, RMSEA = .06. The Satorra-Bentler chi-square difference test was used to compare the model with the non-significant paths and the model with the non-significant paths dropped. Although the chi-square difference test was significant, Satorra-Bentler χ^2 difference (10, N = 166) = 2991.81, $p<.01$, fit indices remained the same compared for both models. Ultimately the non-significant paths were retained. Refer to table eight in

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look forward to coming to campus. 5. I meet with classmates on campus to study & I meet with classmates off campus to socialize.

[2] The following items were not predicted by the behavior domain: 1. I meet with my classmates off campus to socialize, 2. I meet with my classmates on campus to socialize, 3. I meet with my classmates off campus to study, 4. I meet with my classmates on campus to study, 5. When I have questions regarding coursework, I attend faculty office hours, 6. Meeting with my classmates to study helps me to understand course material, and 7. Participating in campus clubs, organizations, and/or recreational activities has exposed me to a variety of new and interesting cultures. The items "I feel comfortable approaching my professors with questions regarding coursework" and "I feel comfortable asking my professors to clarify course information" were not predicted by the affect domain. The item "I think the library has good print resources available for my use" was not predicted by the cognitive domain.

Appendix A for a listing of all standardize and unstandardized coefficients for the exploratory eight factor model.

Results for Confirmatory Models

Hypothesized Models

The preliminary models that were tested during the exploratory analyses phase were used as the basis for a series of confirmatory models estimated with a new dataset; the merged winter 2008 and fall 2008 dataset. Confirmatory factor analysis, based on data collected from the winter 2008 and fall 2008 quarters, was performed through EQS 6.1. Three models of student engagement were hypothesized. The first hypothesized model was a three-factor model of student engagement, which consisted of behavioral, affect, and cognitive factors. The second hypothesized model was a five-factor model of student engagement, which consisted of class participation, relationship with faculty/staff, relationship with peers, participation in campus activities, and utilization of campus facilities factors. Lastly, an eight-factor model of student engagement was hypothesized, which consisted of behavioral, affect, cognitive, class participation, relationship with faculty

and staff, relationship with peers, participation in campus activities, and utilization of campus facilities factors. The three-factor model is presented in figure one Appendix B, the five-factor model is presented in figure two Appendix B, and the eight-factor model is presented in figure three Appendix B. The circles represent latent variables and the rectangles represent measured variables. Absence of a line connecting variables implied no hypothesized direct effect. The behavioral, affect, and cognitive factors were hypothesized to covary with one another and is presented in figure four Appendix B. The class participation, relationship with faculty/staff, relationship with peers, participation in campus activities, and utilization of campus facilities were hypothesized to covary with one another and are presented in figure five Appendix B.

Assumptions

The assumptions where evaluated through SPSS and EQS. There were a total of 376 cases for the merged dataset. All thirty-five variables had missing cases; however there were no variables with 5% missing data. Item V21, "It is important for me to feel integrated in campus organizations and clubs", had the highest number of missing cases with

nine. Missing values analyses was not conducted given that there were no variables with 5% missing data. The data were considered missing completely at random. Skewness, kurtosis, and univariate outliers were assessed using a *Z*-score value of $\pm$ 3.3, $p < .001$. There was evidence that univariate normality was violated. Several variables were positively skewed with *Z*-scores ranging from 8.45 to 3.45. Several variables were negatively skewed with Z-scores ranging from -8.07 to -3.35. There were variables that were kurtotic. The item V12, "I feel that my professor interacts with me in a professional manner", had two outliers, Z = 3.79, corresponding raw score of 1 (never). Item V14, "In the classes I'm taking I feel that the professor creates a learning environment", had four outliers, Z = -3.51, corresponding raw score of 1 (never). The item V26, "what I am learning now will help me in future classes", had three outliers, Z = 3.87, corresponding raw score of 1 (never). Item V32, "While in class, I think about how I will use information to complete homework assignments", had one outlier, Z = 4.77, corresponding raw score of 1 (never). These outliers were deleted from the analysis. Using Mahalanobis distance,

critical χ^2= 73.40 (df = 35) p<.001, fourteen multivariate outliers were identified, and deleted from the analysis.

The EM Algorithm method of data imputation was used. After imputing the data, skewness and kurtosis were reassessed. The same skewed variables before data imputation were still skewed after data imputation. After removing univariate and multivariate outliers, skewness and kurtosis was re-evaluated, however the same variables were still skewed and kurtotic. For a complete listing of descriptive statistics refer to table two in Appendix A. For a listing of skewed variables refer to table four in appendix A. After removing all univariate and multivariate outliers, structural equation modeling (SEM) was performed using a final sample size of 359. Mardia's Normalized coefficient = 51.89, p<.001 indicating violation of multivariate normality.

Model Estimation

Due to violation of univariate and multivariate normality, the models were estimated with maximum likelihood estimation and tested with the Satorra-Bentler scaled chi-square. The standard errors were adjusted to the extent of the non-normality (Bentler & Dijkstra, 1985). The models were evaluated with χ^2 as well as the CFI and

RMSEA. Values greater than .95 for the CFI and less than .06 for the RMSEA indicate good-fitting models (Hu & Bentler, 1998, 1999; Steiger & Lind, 1980). The hypothesized three-factor model was tested. No support was found for the hypothesized three-factor model, Satorra-Bentler χ^2 (557, N = 359) = 3401.72., $p<.01$, Robust CFI = .60, RMSEA = .12. These results were consistent with the results obtained during the exploratory analyses.

Next, the hypothesized five-factor model was tested. No support was found for the hypothesized five-factor model Satorra-Bentler χ^2 (550, N = 359) = 2166.29, $p<.01$, Robust CFI = .77, RMSEA = .09. These results were consistent with the results obtained from the developmental sample. The participation in class factor (F1) and relationship with faculty (F2) were correlated the highest, r = .83.

Lastly, the hypothesized eight-factor model was tested. During scale development analyses, a total of five post-hoc correlated errors were added to the model. Chi-square difference tests were conducted after adding each path and each path significantly improved the model. The eight-factor model was tested with the same correlated errors. There was support for the eight-factor model, Satorra-Bentler χ^2 (493, N = 359) = 933.69, $p<.01$, Robust

CFI = .94, RMSEA = .05. Results also indicated that effects of the correlated error paths were not due to chance. To provide evidence that the eight factor model was the better fitting model when compared to the three and five factor models, the Satorra-Bentler chi-square difference test was used (Satorra, 2000; Satorra & Bentler, 2001). In comparing the three factor model and the eight factor model, Satorra-Bentler $\chi^2_{\text{difference}}$ (65, N = 359) = 2816.59, $p<.01$, providing evidence that the eight factor model fit the data better when compared to the three factor model. In comparing the five factor and eight factor model, Satorra-Bentler $\chi^2_{\text{difference}}$ (58, N = 359) = 1236.26, $p<.01$, providing evidence that the eight factor model fit the data better when compared to the five factor model. A listing of the Satorra-Bentler $\chi^2_{\text{difference}}$ tests are presented in table six, Appendix A. There were a total of twenty paths that were not predicted by either the three domains (behavioral, affect, and cognitive), the five target factors (participation in class, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities), or a combination of both. These paths were not dropped. Refer

to table nine in appendix A for complete listings of the standardized and unstandardized coefficients of each item.

It was hypothesized that the domains would correlate with each other and the factors would correlate with each other. Results showed that all correlations between the domains were significant and the correlations between the factors were statistically significant with the exception of behavior and cognitive $r = .15$, $p > .05$. There were correlations between domains that were exceedingly high, suggesting that the there are factors that are not independent. Affect and cognitive were correlated, $r = .96$, $p < .05$, affect and participation in class were correlated $r = -.99$, $p < .05$, and affect and relationship with faculty and staff were correlated $r = .94$, $p < .05$. Cognitive and participation in class were correlated, $r = -.93$, $p < .05$, cognitive and relationship with faculty and staff was correlated, $r = .99$, $p < .05$, and lastly, class participation and relationship with faculty and staff was correlated, $r = -.90$, $p < .05$. Refer to table seven in Appendix A for a listing of all domain and target factor correlations.

CHAPTER FOUR

GENERAL DISCUSSION

A series of nested models were tested to determine the underlying factor structure of the Student Engagement Scale. There was no support for the factor structure with only behavioral, affect, and cognitive domains. There was also no support for the factor structure with only target factors: class participation, relationship with peers, relationship with faculty and staff, campus activities, and utilization of campus facilities. There was support for the eight factor model with both domain and target factors. Nested within the full domain target model were the behavioral, affect, and cognitive domains, and the class participation, relationship with faculty and staff, relationship with peers, participation in campus activities, and utilization of campus facilities target factors.

Although there is substantial support for an eight factor structure of student engagement, correlations between the domains and target factors suggest that some factors do not serve as independent factors. These high correlations also suggest that eight factors are not

needed. In assessing the domain correlations, the affect and cognitive domain were highly correlated and 92% of the variance was shared between both domains. An attempt was made to measure affect and cognition independently; however, it appears that the affect and cognitive domains are converging as one factor. This is thought to be the case because both affect and cognition are internal/inward personal states that can influence each other. Thoughts can influence emotional states and emotional states can influence thoughts. Another explanation for the high correlation between the affect and cognitive domains is the possibility there are some items that contain both affect and cognitive statements given the difficulty of writing items that were entirely affect or entirely cognitive. The affect and cognitive domains did not correlate highly with the behavioral domain. The affect and behavior domains shared 4% of the variance and the cognitive and behavioral domains shared 2.25% of the variance.

In assessing the correlations between the target factors, the class participation and relationship with faculty and staff target factors correlated highly, sharing 81% of the variance. In fact there was a negative relationship whereby an increase in class participation was

associated with a decrease in relationship with faculty and staff. These two factors are not independent factors, and what it could possibly mean is that the majority of the student-professor interaction happens in the classroom and not out of the classroom (i.e., during office hours). If this is the case, then the negative relationship between the two factors makes sense in that increased classroom participation, which would include interaction with the professor, would explain decreases in the need to visit the professor during office hours. Conversely, a lack of class participation (and lack of professor interaction) would be associated with increases in relationship with faculty and visiting faculty during office hours.

In assessing the relationship between the domains and target factors, there were domains that correlated extremely highly with target factors. Given the extremely high correlation between affect and cognitive domains, it was not surprising both affect and cognitive domains correlated highly with the same target factors. For instance both affect and cognitive domains correlated highly with the class participation and relationship with faculty and staff target factors. The affect domain and the class participation target factor shared approximately

98% of the variance and the cognitive domain and class participation target factor shared 88% of the variance. In fact these relationships were negative, meaning that as affect increased, class participation decreased and as cognition increased, class participation decreased. One possible explanation for these negative correlations could be that students may have anxious or apprehensive feelings/thoughts in class, so increases in these affective and cognitive states would be associated with a decrease in class participation. Additionally, when closely examining the items that fall under the class participation factor and affect factor it is possible that some items on either factor or domain were answered negatively compared to others. For example, it would not necessarily be expected that a student with positive feelings towards his/her peers or campus environment (items under the affect domain) would also answer positively regarding courses meeting expectations, or using class information to complete homework (items under the class participation factor). The affect and cognitive domains also correlated extremely highly with the relationship with faculty and staff target factor. 88% of the variance is shared between affect and relationship with faculty and staff, and 99% of the

variance is shared between cognitive and relationship with faculty and staff. Increases in affect and cognitive are associated with increases in relationship with faculty and staff. Close examination of the items under the relationship with faculty and staff indicate that a majority of the items address feelings and thoughts regarding professors, and probably the reason why both the affect and cognitive domains are so highly correlated with this target factor. After assessing the relationship between the factors, there is clear evidence that the underlying factor structure of the Student Engagement scale does not contain eight distinct domains and target factors. There seems to be a behavioral domain, a feelings and thoughts about the classroom and professors factor, a relationship with peers target factor, participation in campus activities target factor, and a utilization of campus facilities target factor.

The attempt to create and confirm a complex factor structure of the Student Engagement Scale was attempted for a couple reasons. First, a complex factor structure of student engagement is important because it more accurately reflects the realistic multidimensional nature of the student engagement construct. Consequently, by combining

behavioral, affect, and cognitive domains with specific contextual factors, more specific conclusions could be made regarding engagement. For instance, instead of making broad conclusions about engagement in a behavioral, affect, or cognitive sense, with a complex factor structure, conclusions regarding, say, behavioral engagement in the classroom could be made. With a complex factor structure, the precision to make conclusions regarding the type and context of engagement is possible.

Limitations

A limitation of the study is that after deleting items based on low factor loadings, the Student Engagement Scale still consists of thirty-five items, and still longer than desired. A second limitation of this study is that all items were positively worded, perhaps introducing the issue of acquiescence. According to Crano and Brewer (2006) acquiescence is the tendency to agree with positively worded items. However, there is evidence that negatively worded items load on different factors than positively worded items (Hazlett-Stevens, Ullman, and Craske, 2004). To avoid this potential problem of positively worded items and negatively worded items loading on different factors

and presenting two separate factor structures, it was elected to use all positively worded items.

Future Research

This study addresses the internal consistency (reliability) of the Student Engagement Scale; however additional research is needed to validate the Student Engagement Scale to assess if the scale is truly tapping into the construct of student engagement. Construct validity was assessed through the structural equation modeling analyses; however, in future research additional evidence of construct validity can be determined through the examination of convergent and discriminant validity of the scale. A strong correlation between scores on the Student Engagement Scale and another scale also assessing engagement (i.e., SCEQ) would provide evidence of convergent validity. A weak correlation between scores on the Student Engagement Scale and another scale measuring a completely different construct (i.e., religiosity) would provide evidence of discriminant validity. Aside from assessing construct validity, future research should assess the predictability of the Student Engagement Scale. Future research should use the Student Engagement Scale to predict

retention/dropout or academic achievement (i.e., GPA) as indicated by the student engagement literature. Of importance here is to assess whether student engagement is able to predict academic success above and beyond other demographic factors that are said to impact achievement. For instance, does student engagement improve prediction of GPA after accounting for social economic status, parents' years of schooling, hours worked per week, etc.? If the answer is yes then there are important implications in the sense that student engagement is a variable that can be manipulated. Efforts, on several levels, can be made to increase a student's level of engagement, whereas other demographic variables are pre-existing and it is more difficult to change these variables.

APPENDIX A

TABLES

Table 1. Descriptive statistics for the exploratory analyses

Items	Mean	SD
Involved in organizing events and activities on campus	2.38	1.48
I attend campus events/activities even if I am not affiliated with club	2.68	1.40
Involved in a campus club, organization and/or recreational activity	2.62	1.56
Participating in campus clubs/activities exposes me to new ideas	3.15	1.29
Even when no questions about course work I attend faculty office hrs	2.52	1.20
When I have questions regarding coursework I attend faculty office hrs	3.07	1.07
I meet with my classmates off campus to socialize	3.34	1.25
I meet with my classmates on campus to socialize	3.59	1.11
I meet with my classmates off campus to study	3.14	1.26
Meeting with classmates to study helps me understand course material	3.43	1.16
I meet with my classmates on campus to study together	3.41	1.16
I feel that my professor interacts with me in a professional manner	3.91	.87
I feel that this campus is accommodating to the needs of all students	3.83	.85
In classes this quarter, I feel that my professor creates a learning environment	3.79	.91
I feel safe on campus	3.81	.89
I admire my surroundings when I walk through campus	3.85	.97
I look forward to coming to campus	3.80	.94
I feel comfortable asking my professors to clarify course information	3.76	.93
I feel comfortable approaching my professor with questions regarding coursework	3.79	.95
I feel like an important member of campus club/organization	2.91	1.38

Table 1. Descriptive statistics for the exploratory analyses continued

Items	Mean	SD
Important to feel integrated in campus clubs/organization	3.10	1.34
Meeting with classmates make attending CSUSB more enjoyable	3.80	1.04
Meeting with classmates helps me to feel less alone as a student	3.70	1.05
I enjoy working on group projects outside of class	3.42	1.07
Positive experiences with staff will motivate me to seek additional help in the future	3.94	.90
What I am learning now will help in future classes	3.95	.84
Classes so far met my expectation about what I thought college would be like	3.78	.79
I think the library has good print resources available for my use	3.77	1.14
Believe working with other students with different backgrounds will benefit me in the work force	3.94	.95
Computer labs are important to complete homework/assignments	3.94	1.03
Meeting with professors helps solidify future academic goals	3.58	1.00
Use information from class lecture to complete homework	4.09	.83
I think being involved in campus clubs will make me well rounded student	3.38	1.23
I think about meeting with my classmates to complete assignments	3.34	1.18
Good experiences with classmates, more motivated to work with others in the future	3.92	.96

Table 2. Descriptive statistics for the confirmatory sample

Items	Mean	SD
Involved in organizing events and activities on campus	2.00	1.33
I attend campus events/activities even if I am not affiliated with club	2.52	1.39
Involved in a campus club, organization and/or recreational activity	2.36	1.58
Participating in campus clubs/activities exposes me to new ideas	3.20	1.35
Even when no questions about course work I attend faculty office hrs	2.14	1.18
When I have questions regarding coursework I attend faculty office hrs	3.00	1.20
I meet with my classmates off campus to socialize	3.15	1.36
I meet with my classmates on campus to socialize	3.46	1.23
I meet with my classmates off campus to study	2.79	1.37
Meeting with classmates to study helps me understand course material	3.27	1.27
I meet with my classmates on campus to study together	3.23	1.27
I feel that my professor interacts with me in a professional manner	4.22	.85
I feel that this campus is accommodating to the needs of all students	4.00	.92
In classes this quarter, I feel that my professor creates a learning environment	4.09	.88
I feel safe on campus	3.94	.98
I admire my surroundings when I walk through campus	3.94	1.05
I look forward to coming to campus	3.96	1.00
I feel comfortable asking my professors to clarify course information	4.08	.96
I feel comfortable approaching my professor with questions regarding coursework	4.08	.98
I feel like an important member of campus club/organization	2.69	1.39

Table 2. Descriptive statistics for confirmatory analyses continued

Items	Mean	SD
Important to feel integrated in campus clubs/organization	3.00	1.24
Meeting with classmates make attending CSUSB more enjoyable	3.83	1.01
Meeting with classmates helps me to feel less alone as a student	3.80	1.09
I enjoy working on group projects outside of class	3.34	1.19
Positive experiences with staff will motivate me to seek additional help in the future	4.06	.94
What I am learning now will help in future classes	4.23	.83
Classes so far met my expectation about what I thought college would be like	3.90	.95
I think the library has good print resources available for my use	3.97	.94
Believe working with other students with different backgrounds will benefit me in the work force	4.02	.99
Computer labs are important to complete homework/assignments	4.01	1.13
Meeting with professors helps solidify future academic goals	3.80	1.04
Use information from class lecture to complete homework	4.38	.71
I think being involved in campus clubs will make me well rounded student	3.46	1.27
I think about meeting with my classmates to complete assignments	3.20	1.24
Good experiences with classmates, more motivated to work with others in the future	3.97	.95

Table 3. Skewed variables for the exploratory analyses

Variable	Skewness
I attend class on a regular basis	-4.14
I use information from class lecture to complete homework assignments	-4.13
Working with peers makes CSUSB more enjoyable	-3.89
I think the library has good print resources	-3.48
Computer labs are important for homework	-3.59

Table 4. Skewed variables for Confirmatory Analyses

Variable	Skew	Variable	Skew
Involved in organizing events	8.09	Peers make CSUSB enjoyable	-4.25
Involved in campus events	4.82	Peers make me feel less alone	-5.25
No questions still attend office hrs	6.40	Positive experiences motivate me to seek help in the future	-5.45
Socialize with peers on campus	-3.96	What I'm learning now will help for future classes	-5.83
Professor interacts professionally	-5.08	Courses have meet expectation of what college would be like	-3.77
Campus accommodating to everyone	-4.43	I think the library has good print resources	-4.98
Professor creates learning environment	-3.98	Experience with different cultures will help in the future	-5.79
I feel safe on campus	-5.18	Computer labs important for completing homework	-7.56
I admire my surroundings on campus	-5.89	Meeting with professors helps solidify future goals	-4.88
Look forward to coming to campus	-5.62	Use class information to complete homework	-5.97
Comfortable asking professor to clarify information	-6.90	Participation in campus events will make me a well rounded student	-3.38
Comfortable approaching professor with course information	-7.12	Positive experiences will peers will motivate to work with others in future	-5.46

Table 5. Items removed from the Student Engagement Scale using EFA

Item	Factor loadings
While in class I think about how I will use the information to complete homework assignments	.37
When I need help with seeking various resources (i.e. the library), I ask staff (i.e. the librarian) to help in obtaining those resources	.51
I attend scheduled class meetings on a regular basis	.14
I use the library at CSUSB as a place to study	.25
I think that the student union is a good place to study	.27
I voluntarily answer questions when they are posed to class	.47
I feel comfortable asking questions in class	.39
I take advantage of the gym and recreational center at CSUSB	.27
Meeting with professors helps me do well in classes	.44
I participate in class discussions	.15
I enjoy participating in group activities during class time	.51

Table 6. Chi-square difference tests for exploratory and confirmatory analyses

	Exploratory analyses		Confirmatory analyses
8 factor vs. 3 factor	S-B $\chi^2_{\text{difference}}(46, N = 166) = 1215.19, p<.01$	8 factor vs. 3 factor	S-B$\chi^2_{\text{difference}}(65, N = 359) = 2816.59, p<.01$
8 factor vs. 5 factor	S-B$\chi^2_{\text{difference}}(39, N = 166) = 562.42, p<.01$	8 factor vs. 5 factor	S-B$\chi^2_{\text{difference}}(58, N = 359) = 1236.26, p<.01$

Table 7. Correlations among the Eight Factors for confirmatory analyses

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
Behavior	1.00							
Affect	.20	1.00						
Cognitive	.15	**.96***	1.00					
Class	.21	**-.99***	**-.95***	1.00				
Faculty	.13	**.94***	**.99***	**-.90***	1.00			
Peers	.47	.76*	.70*	-.77*	.66*	1.00		
Activities	.49*	.49*	.46*	-.49*	.41*	.45*	1.00	
Facilities	.06	.59*	.71*	-.55*	.72*	.39*	.39*	1.00

*p<.05

Table 8 . Unstandardized and standardized coefficients for exploratory 8-factor model

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
V1	.94* (.65)						1.00* (.69)	
V2	.72* (.52)						.94* (.68)	
V3	.67* (.43)						1.07* (.70)	
V4	-.01 (-.01)						1.16* (.90)	
V5	.33* (.28)				.50* (-.50)			
V6	.13 (.12)				.61* (-.58)			
V7	-.02 (-.02)					1.01* (.80)		
V8	-.04 (-.30)					.86* (.78)		
V9	.07 (.06)					1.23* (.90)		
V10	-.02 (-.02)					1.04* (.90)		
V11	.04 (.03)					1.01* (.89)		
V12		.36* (.41)			-.60* (-.68)			

*p<.05
Note: Standardized coefficients in parentheses

Table 8. Unstandardized and standardized coefficients for exploratory 8-factor model continued

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
V13		.32* (.37)						.70* (.81)
V14		.40* (.42)		.64* (.70)				
V15		.43* (.47)						.57* (.62)
V16		.30* (.30)						.53* (.54)
V17		.32* (.33)						.57* (.60)
V18		.10 (.11)			-.60* (-.64)			
V19		.12 (.12)			.59* (-.62)			
V20		-.20 (-.14)					1.12* (.80)	
V21		-.18* (-.14)					1.19* (.88)	
V22		.68* (.60)				.82* (.74)		
V23		.68 (.60)				.74 (.66)		
V24		.43 (.39)				.78* (.70)		

*p<.05
Note: Standardized coefficients in parentheses

Table 8. Unstandardized and standardized coefficients for exploratory 8-factor model continued

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
V25			.48* (.52)	-.54* (-.59)				
V26			.37* (.43)	.58* (.68)				
V27			.30* (.37)	.53* (.66)				
V28			.15 (.13)	.67* (.58)				
V29			.60* (.59)			.54* (.53)		
V30			.49* (.43)					.44* (.42)
V31			.44* (.44)		-.66* (-.65)			
V32			.23 (.27)	.46* (.54)				
V33			.18* (.15)				1.08* (.89)	
V34			.228* (.19)			.93* (.77)		
V35			.71* (.69)			.64 (.62)		

*p<.05
Note: Standardized coefficients in parentheses

Table 9. Unstandardized and standardized coefficients for Confirmatory 8-factor model

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
V1	1.01* (.77)						.35* (.267)	
V2	.57* (.41)						.55* (.40)	
V3	.73* (.47)						.74* (.47)	
V4	-.22* (-.17)						1.23* (.96)	
V5	.50* (.43)				.32* (.27)			
V6	.25* (.21)				.44* (.67)			
V7	-.02 (-.001)					1.00* (.73)		
V8	-.16 (-.12)					1.00* (.82)		
V9	.06 (.04)					1.11* (.81)		
V10	-.18 (-.14)					1.16* (.91)		
V11	-.19 (-.15)					1.19* (.94)		
V12		-1.32* (-1.56)			1.67* (2.00)			

*p<.05
Note: Standardized coefficients in parentheses

Table 9. Unstandardized and standardized coefficients for Confirmatory 8-factor model continued

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
V13		-.20* (-.21)						.91* (.99)
V14		7.27 (8.26)		6.89 (7.93)				
V15		-.06 (-.06)						.78* (.79)
V16		.13 (.13)						.42* (.40)
V17		.20 (.20)						.42* (.42)
V18		-1.03 (-1.08)						.44* (1.56)
V19		-.109* (-1.10)			1.51* (1.53)			
V20		.15* (.11)					.98* (.70)	
V21		.23* (.19)					.88* (.70)	
V22		1.02* (1.01)				-.19 (-.19)		
V23		1.08* (.99)				.28 (-.26)		
V24			.57* (.48)			.27* (.23)		

*p<.05
Note: Standardized coefficients in parentheses

Table 9. Unstandardized and standardized coefficients for Confirmatory 8-factor model continued

	Behavior	Affect	Cognitive	Class	Faculty	Peers	Activities	Facilities
V25			-3.64 (-3.87)		4.17 (4.44)			
V26			1.65* (1.97)	1.27 (1.52)				
V27			1.67* (1.70)	1.21 (1.27)				
V28			-.14 (-.15)					.76* (.81)
V29			.69* (.70)			.21 (.21)		
V30			.19 (.167)					.40* (.35)
V31			-3.63 (-3.50)		4.27 (4.12)			
V32			.79* (1.12)	.52* (.73)				
V33			.17* (.13)				.91* (.71)	
V34			.24* (.19)			.76* (.62)		
V35			.77* (.81)			.11 (-.12)		

*p<.05
Note: Standardized coefficients in parentheses

APPENDIX B

DIAGRAMS

Diagram 1. Hypothesized three-factor structure of Student Engagement

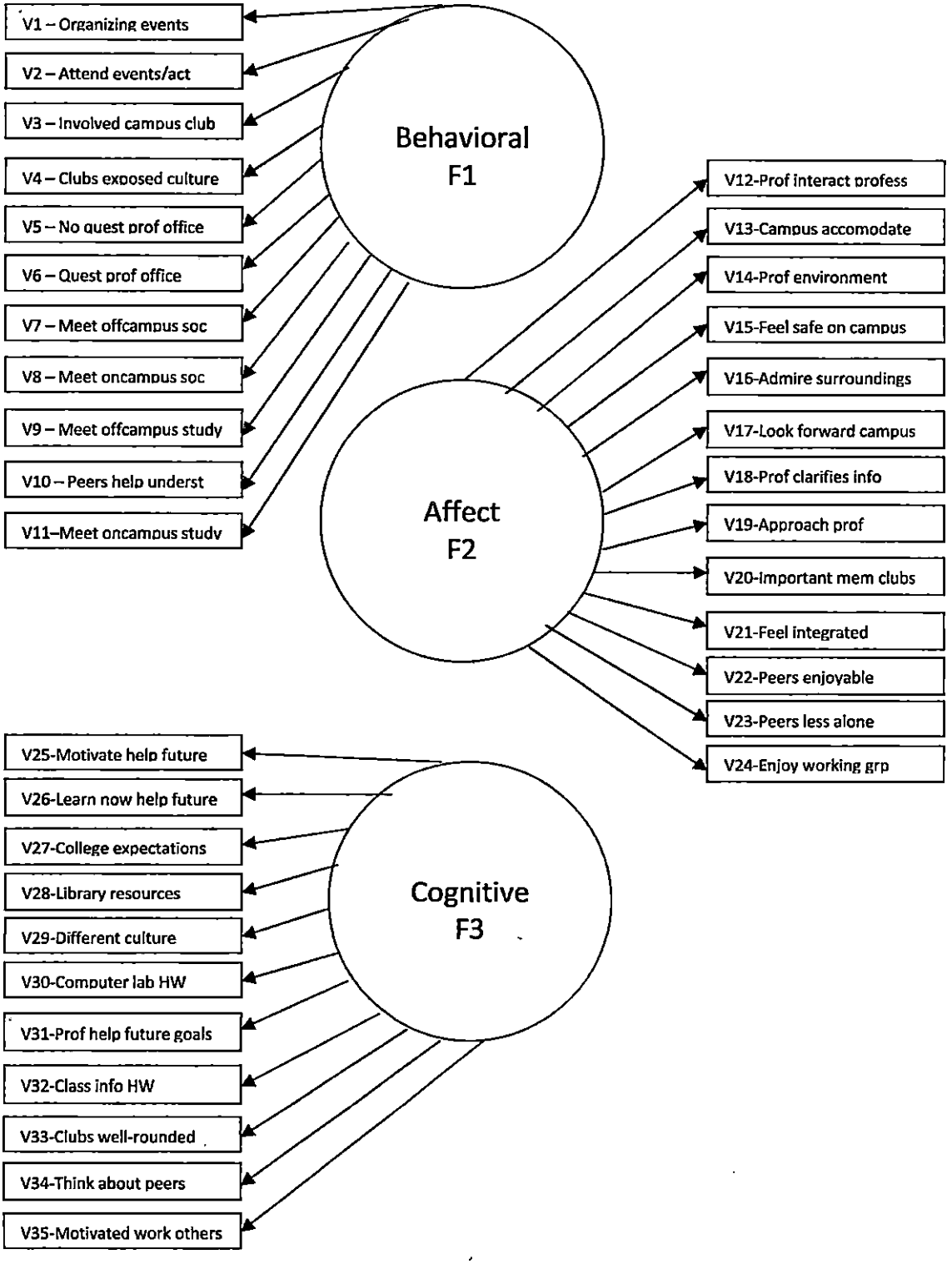


Diagram 2. Hypothesized five-factor structure of Student Engagement

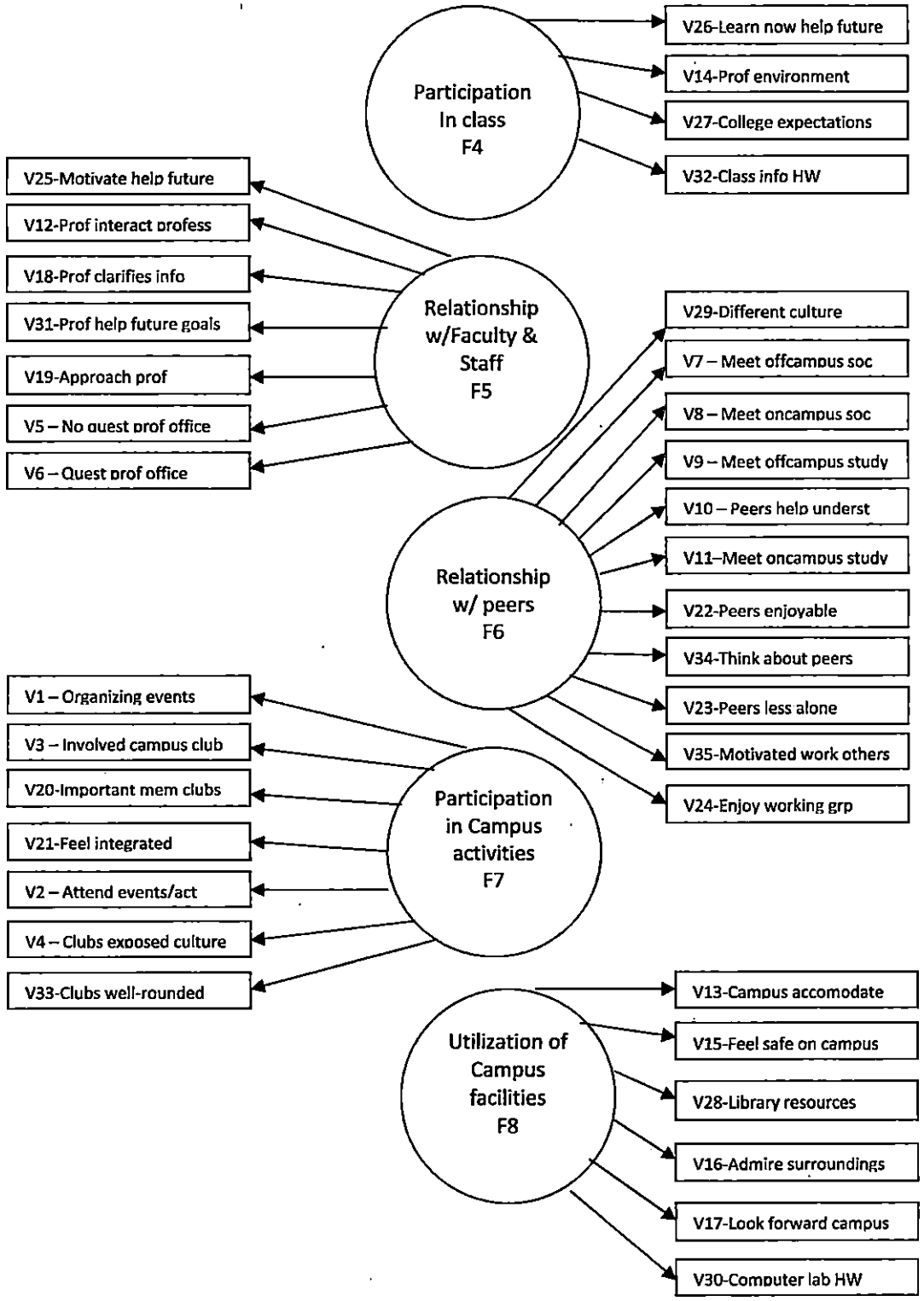


Diagram 3. Hypothesized eight-factor structure

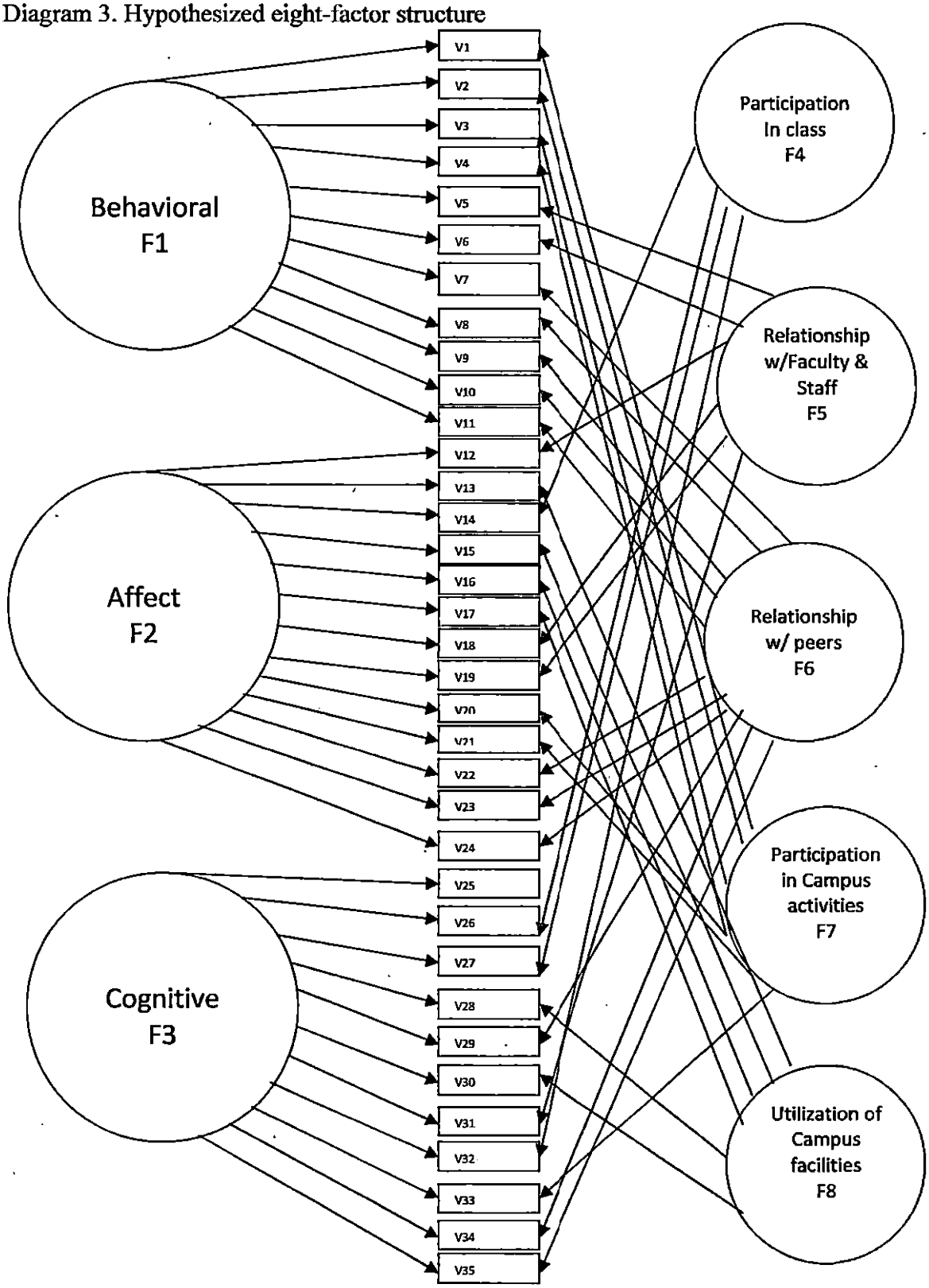


Diagram 4. Covariation among the three domains

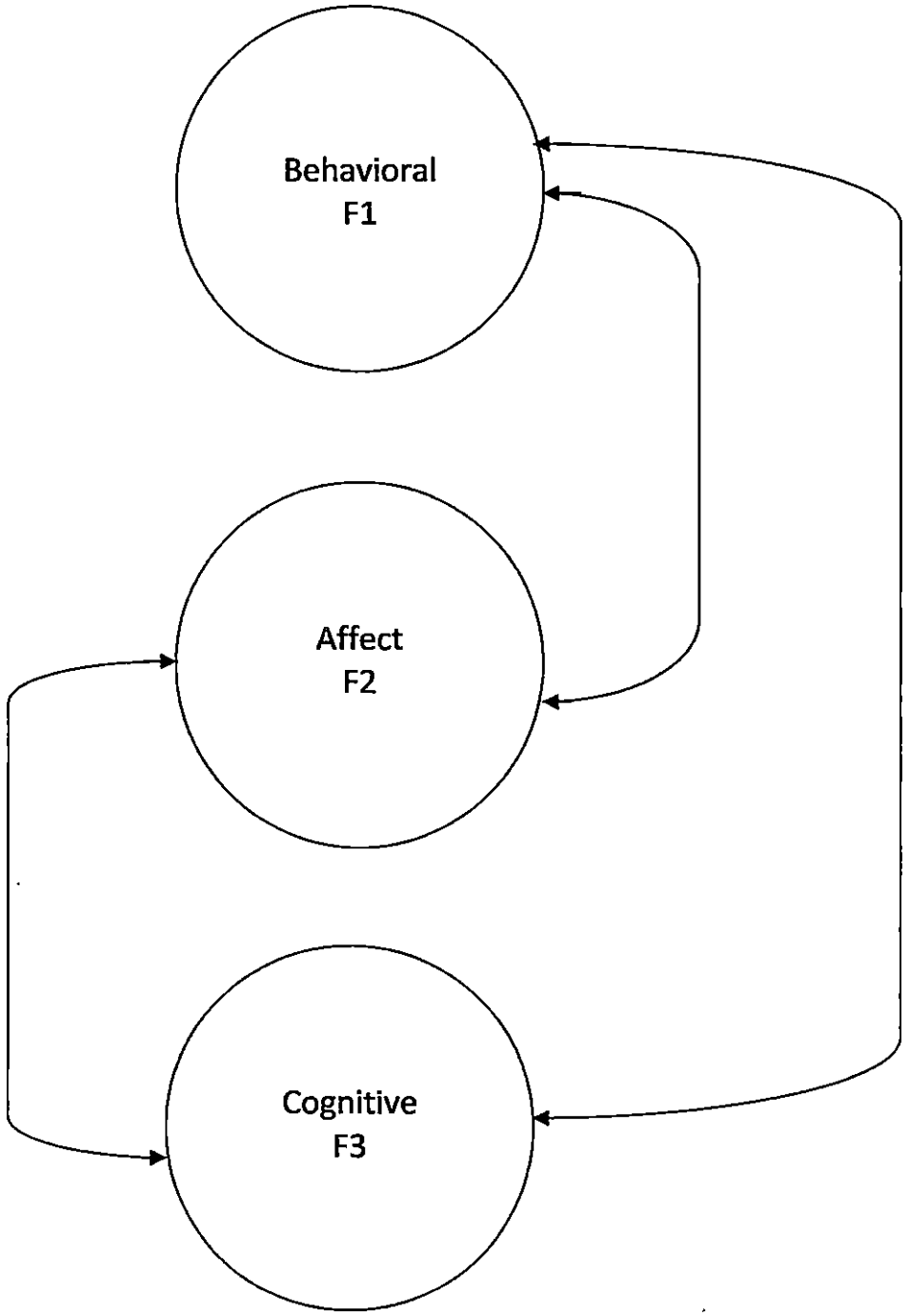
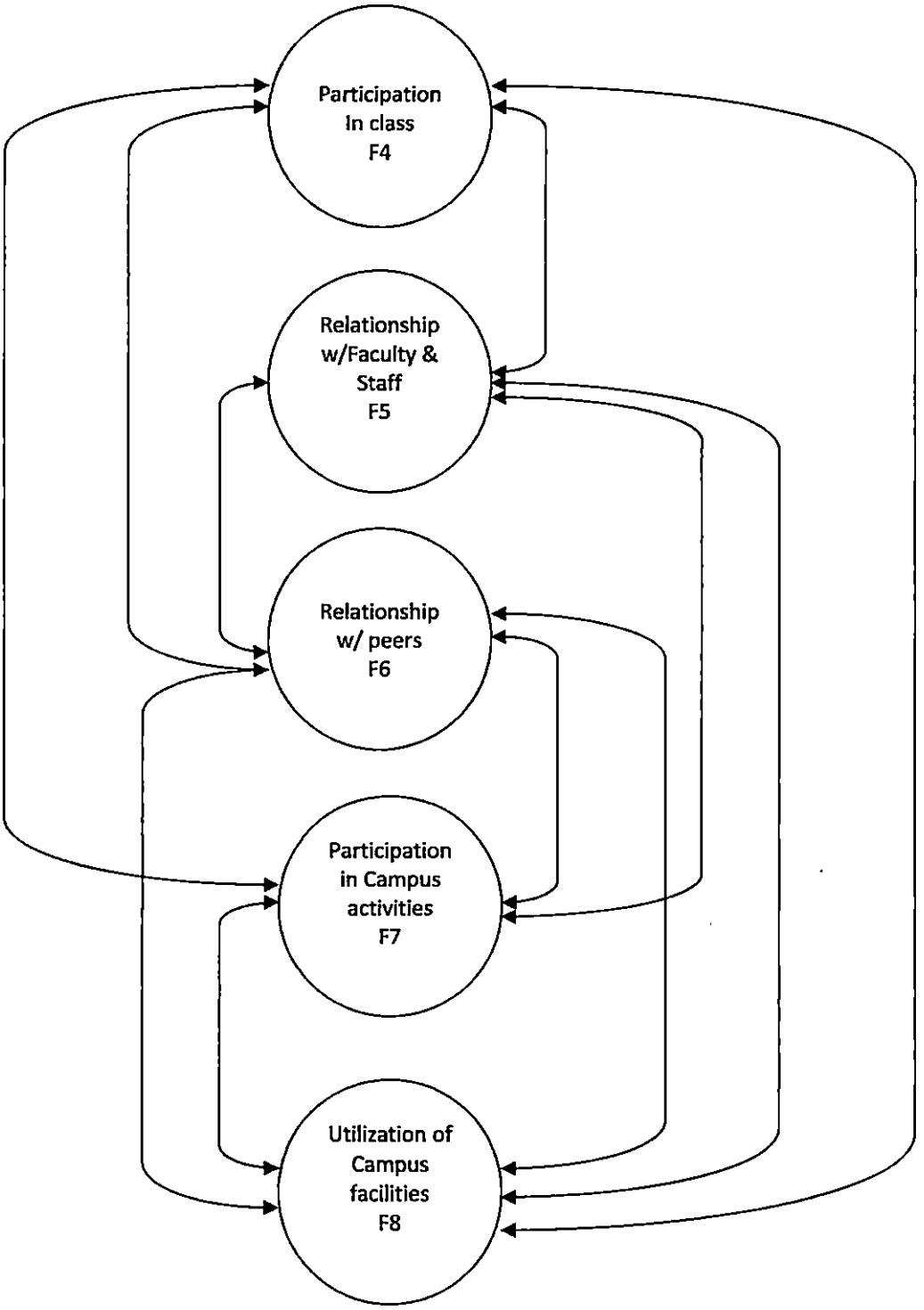


Diagram 5. Covariation among five target factors



APPENDIX C

STUDENT ENGAGEMENT SCALE

Original Student Engagement Scale

Class Participation

Behavioral
1. I attend scheduled class meetings on a regular basis.
2. I participate in class discussions.
3. I voluntarily answer questions when they are posed to the class.
4. I use information from class lectures to complete homework assignments.

Affect
5. I feel comfortable asking questions in class.
6. I enjoy participating in group activities during class time.
7. In the classes I'm taking this quarter, I feel that my professors create a learning environment.

Cognitive
8. The classes I have taken so far met my expectation about what I thought college would be like.
9. What I am learning now in class will help me in future classes.
10. While in class, I think about how I will use the information to complete homework assignments.

Relationship with Faculty and Staff

Behavioral

11. When I have questions regarding coursework, I attend faculty office hours.
12. Even when I do NOT have questions about coursework, I attend faculty office hours.
13. When I need help with seeking various resources (i.e. the library), I ask staff (i.e. the librarian) to help in obtaining those resources.

Affect
14. I feel comfortable approaching my professors with questions regarding course work.
15. I feel comfortable asking my professors to clarify course information.
16. I feel that my professors interact with me in a professional manner.

Cognitive
17. Meeting with professors helps me to do well in classes.
18. Meeting with my professors helps me to solidify my future academic goals.
19. Positive experiences with staff (people at the library, admissions, etc.) will motivate me to seek additional help in the future.

Relationship with Peers

Behavioral

20. I meet with classmates outside of class, on campus, to study together.
21. I meet with my classmates outside of class, on campus, to socialize.
22. I meet with my classmates off campus to study.
23. I meet with my classmates off campus to socialize.
24. I enjoy working in group projects for classes outside of class.

Affect

25. Meeting with my classmates makes attending CSUSB more enjoyable.
26. Meeting with my classmates helps me to feel supported.
27. Meeting with my classmates helps me to feel less alone as a student.

Cognitive

28. I think about meeting with my classmates to complete class assignments.
29. When I have good experiences with my classmates, I am more motivated to work with others in future classes.
30. I believe that working with other students with cultural backgrounds different from mine will be beneficial when I enter the work force.

Participation in Campus Activities

Behavioral

31. I am involved in a campus club, organization, and/or recreational activity, such as the associated student body, a club within my major or a sorority/fraternity, and/or intramural sports.
32. I am involved in organizing events and activities on campus, such as club meetings, colloquiums, banquets, movie nights, etc.
33. I attend campus events and/or activities even if I am not affiliated with the club or organization hosting the event.

Affect

34. I feel like an important member of a campus club, organization, and/or recreational activity.
35. It is important for me to feel integrated in campus organizations and clubs.
36. I feel that being involved in campus clubs, organizations, and/or recreational activities enhances my experience at CSUSB.

Cognitive

37. I think that being involved in campus clubs, organizations, and/or recreational activities will make me a more well-rounded student.
38. Participating in campus clubs, organizations, and/or recreational activities has exposed me to a variety of new and interesting cultures and ideas.

Utilization of campus facilities

Behavioral

39. I use the library at CSUSB as a place to study.
40. I take advantage of the gym and recreational center at CSUSB.

Affect

41. I admire my surroundings when I walk through the campus.
42. I feel safe when I am on campus.
43. I look forward to coming to campus.
44. I feel that this campus is accommodating to the needs of all students.

Cognitive

45. I think that the library has good print resources available for my use.
46. I think that the student union is a good place to study.
47. The computer labs on campus are important for me to do my homework or complete assignments for my classes.

Final Student Engagement Scale

Class Participation

Behavioral
1. I use information from class lectures to complete homework assignments.

Affect
2. In the classes I'm taking this quarter, I feel that my professors create a learning environment.

Cognitive
3. The classes I have taken so far met my expectation about what I thought college would be like.
4. What I am learning now in class will help me in future classes.

Relationship with Faculty and Staff

Behavioral

5. When I have questions regarding coursework, I attend faculty office hours.
6. Even when I do NOT have questions about coursework, I attend faculty office hours.

Affect
7. I feel comfortable approaching my professors with questions regarding course work.
8. I feel comfortable asking my professors to clarify course information.
9. I feel that my professors interact with me in a professional manner.

Cognitive
10. Meeting with professors helps me to do well in classes.
11. Meeting with my professors helps me to solidify my future academic goals.
12. Positive experiences with staff (people at the library, admissions, etc.) will motivate me to seek additional help in the future.

Relationship with Peers

Behavioral

13. I meet with classmates outside of class, on campus, to study together.
14. I meet with my classmates outside of class, on campus, to socialize.
15. I meet with my classmates off campus to study.
16. I meet with my classmates off campus to socialize.
17. I enjoy working in group projects for classes outside of class.

Affect

18. Meeting with my classmates makes attending CSUSB more enjoyable.
19. Meeting with my classmates helps me to feel less alone as a student.

Cognitive

20. I think about meeting with my classmates to complete class assignments.
21. When I have good experiences with my classmates, I am more motivated to work with others in future classes.
22. I believe that working with other students with cultural backgrounds different from mine will be beneficial when I enter the work force.

Participation in Campus Activities

Behavioral

23. I am involved in a campus club, organization, and/or recreational activity, such as the associated student body, a club within my major or a sorority/fraternity, and/or intramural sports.
24. I am involved in organizing events and activities on campus, such as club meetings, colloquiums, banquets, movie nights, etc.
25. I attend campus events and/or activities even if I am not affiliated with the club or organization hosting the event.

Affect

26. I feel like an important member of a campus club, organization, and/or recreational activity.
27. It is important for me to feel integrated in campus organizations and clubs.

Cognitive

28. I think that being involved in campus clubs, organizations, and/or recreational activities will make me a more well-rounded student.
29. Participating in campus clubs, organizations, and/or recreational activities has exposed me to a variety of new and interesting cultures and ideas.

Utilization of campus facilities
Affect

30. I admire my surroundings when I walk through the campus.
31. I feel safe when I am on campus.
32. I look forward to coming to campus.
33. I feel that this campus is accommodating to the needs of all students.

Cognitive

34. I think that the library has good print resources available for my use.
35. The computer labs on campus are important for me to do my homework or complete assignments for my classes.

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