

STUDENT EXPERIENCE IN THE RESEARCH UNIVERSITY (SERU) PROJECT

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SERU PROJECT TECHNICAL REPORT*

FACTOR STRUCTURE AND RELIABILITY OF THE 2008 AND 2009 SERU/UCUES QUESTIONNAIRE CORE

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This technical report summarizes the third independent factor analysis of the SERU/UCUES questionnaire responses of students with majors. The 2009 solution employed the same quantitative analysis used in the prior solutions -- varimax orthogonal rotation to determine principal components followed by promax oblique rotation to identify subfactors -- supplemented by collaborative judgment of a research team of faculty, institutional researchers and a graduate student. Overall the three solutions have been remarkably similar. The most significant and substantive difference in factor structure was between 2006 and 2008 and was the result of several academic experience items being moved from a 2006 module to the core segment of the questionnaire. The most substantive differences from 2008 to 2009 were methodological: respondents from several AAU institutions were included, factor analysis was performed on a weighted random sample of University of California and participating AAU students, factor scores were computed using item loadings, and a reduced set of factor scores was computed for all students, whether they had declared majors or not.

The 2009 structure is comprised of eight principal factors each with two or more subfactors. The principal component factors are:

- Factor 1: Satisfaction with Educational Experience
- Factor 2: Current Skills Self-Assessment (Nonquantitative)
- Factor 3: Engagement with Studies
- Factor 4: Gains in Self-Assessment of Skills (Nonquantitative)
- Factor 5: Development of Scholarship
- Factor 6: Campus Climate for Diversity
- Factor 7: Academic Disengagement (Inverted Scale)
- Factor 8: Quantitative Professions

Introduction

Random Sample

Factor analysis was performed on a simple random sample without replacement of students with declared majors weighted by institution. For the institutions in this project those weights were: Florida (1,675), Michigan (1,194), Minnesota (1,093), Pittsburgh (618), Rutgers University (1,175), Berkeley (902), Davis (1,047), UCLA (1,062), Riverside (364), San Diego (1,095),

Santa Cruz (482), Santa Barbara (694), and Irvine (1,100). The sample was about 15,000 in order to provide about 12,500 valid responses for each factor. The sample was weighted by the number of undergraduates at each institution assigned to evaluate their major(s) and about half were from the AAU group. The student responses for Berkeley, who participated in both the 2008 and 2009 administrations, were taken from the 2008 UCUES administration where Berkeley had a higher response rate. Overall, the combined UC/AAU sample used in the current study should be much more robust and can be generalized to a broader population than was true for the prior solutions.

Summary of Changes to Factor Structure from 2008 to 2009

The subfactor structure of Self Assessment of Skills (Nonquantitative), both current proficiency and gain scores, was changed from two to three subfactors. Factor 2, current skills, and Factor 4, gain in skills, now include a Computer and Research Skills subfactor. The new Computer and Research Skills subfactor broke out cleanly in 2009. Though it is not clear why these two subfactors did not emerge from the 2008 data, the result of their presence in the 2009 study can increase the value of these data to departments undergoing academic program review of Factors 2 and 4.

The promax rotation to determine subfactors for Campus Climate for Diversity, Factor 6, found that agreement with the statement that students were respected regardless of sexual orientation loaded on two subfactors in 2009 (Table 6). Whereas, in 2008, it fell with ratings of climate for SES, gender and race items on the subfactor for personal characteristics, in 2009 it also loaded with religious and political beliefs on the climate of respect for personal beliefs subfactor. One potential explanation is that one sample views sexual orientation as a matter of choice, like religious or political beliefs while the other sample did not view sexual orientation in terms of choice. Given the politically sensitive nature of the item and current understanding of human sexuality, the item was placed with subfactor 6a: Climate for Personal Characteristics.

Factor 7, Academic Disengagement (Inverted Scale), now includes amount of reading. The item asking students to report the percentage of assigned reading that they completed was not included on the solution structure for 2008. It was reverse coded in 2009 and clearly contributed to the principal component and to subfactor, Poor Academic Habits (Table 7). Factor 7 was also changed in 2009 to an inverted scale so that higher values on all factors are better outcomes.

Factor 1: Satisfaction with Educational Experience, subfactor 1d: Satisfaction with Advising and Out of Class Contact that was only advising items, now includes two items that were previously with Clarity of Program Requirements, Policies and Practices and one from Quality of Instruction and Courses in the Major (Table 1). The three items being moved are communication channels being open, students being treated fairly, and faculty providing useful and prompt feedback. The movement of these items makes the prior subfactor more clearly about policies and broadens the advising subfactor to something more generally about communication.

Computing Individual Student Factor Scores

The process of computing factor and subfactor scores in 2009 extended the methodology used in prior years to include factor loadings. Briefly the steps used in computing the factor score include: (1) responses by item are standardized to adjust for item response option types, (2) the mean of items in the factor or subfactor are computed for those standardized responses, and (3) the resulting factor scores are standardized and reported on a scale with a mean of 5 and standard deviation of 2. While the positive effect of this change must be determined by empirical evidence, the use of the factor loading to weight item contributions to the score should result in

more accurate and effective factor scores. Because the loadings are decimal values between zero and one and standard scores have a mean of zero and standard deviation of one, large weights have little effect on the value while small weights tend to move standard scores toward the mean. For example, if a student's standard score on item 1 is 0.8 and the weight of item 1 is 0.9 then the contribution of item one to the factor score is little changed ($0.8 \times 0.9 = 0.72$). If the weight is 0.3 then the contribution of item 1 has changed markedly ($0.8 \times 0.3 = 0.24$) and is moved toward the mean of zero. Similarly, negative values are also moved toward the mean (e.g. $-0.8 \times 0.3 = -0.24$).

New in 2009, factor scores were computed for all students whether they had declared majors or not. It continues to be true that the primary use of SERU/UCUES factor scores is in academic program review, and therefore, the factor structure, loadings and standardization were based on students with declared majors. However, in 2009 the decision was made to compute factor and subfactor scores for all students where computations were supported by a full complement of items. Students without declared majors answer somewhat different questions and therefore principle components 1: Satisfaction with Educational Experience, 7: Academic Disengagement and 8: Quantitative Professions could not be computed for students with undeclared majors. In Factor 1, two subfactors could not be computed, 1a: Quality of Instruction and Courses in the Major and 1e: Clarity of Program Require Policies and Practices. Subfactor 7c: Non-academic Motivations, and Subfactor 8a: Career Orientation, could not be computed. Researchers should use these scores with caution because there is neither current evidence of their validity in applied research nor were they part of the population sampled for the factor analysis and factor score computation processes.

Reliability as Measured by Coefficient Alpha (Table A)

Internal consistency of factors as measured by Cronbach's coefficient alpha ranged from 0.92 for Satisfaction with Educational Experience (Factor 1) to 0.61 for Quantitative Professions (Factor 8) and all subfactor reliability estimates were higher than 0.50. As was true of the factor solution, all reliability estimates of factors and subfactors were remarkably consistent over time and in no instance did the difference from year to year exceed 0.05.

The Factors

Factor 1: Satisfaction with Educational Experience (Table 1)

Factor 1 is an exception to the rule that subfactors were formed by promax solution with oblique rotations. In fact, all items in Satisfaction with Educational Experience load heavily on one vector. The subscales offered for Factor 1 were created by a panel of experts developing the first solution for the 2006 data (Chatman, 2007). The subfactor structure is supported by factor analysis but is equally driven by the desire to provide useful composite measures: instruction, availability, belonging, advising, etc. Again, the decisions were not psychometrically arbitrary and the items do tend to have high internal consistency (Table A). In many respects, they are akin to Pike's notion of scalets and the use in NSSE as "Benchmarks" (see Pike's discussion of scalets, 2006).

Factor 2 and Factor 4: Current Skills Self-Assessment (Nonquantitative) and Gains in Self-Assessment of Skills (Nonquantitative)

The SERU/UCUES questionnaire uses many self-rating items that ask students to assess their skills now and at entry to their campus. These values are used to compute a gain score and the strategy has been shown to be more valid than asking students to assess gain in a more straightforward manner (see discussion in Thomson & Douglass, 2009, pp 5-7). As mentioned

previously, the 2009 solution found a new subfactor, Computer and Research Skills, that greatly improved the usefulness of Factor 2 scores. Items asking about Internet, computer, library research and other research skills now comprise a subfactor distinct from the more general skills of Critical Thinking and Communication (see Table 2). There were slight differences in subfactor composition between the current skills ratings (Factor 2) and gain scores (Factor 4; see Table 4) but they were judged by the 2007 panel (Chatman, 2007) to be of minor importance and certainly of lesser importance than the need to report parallel measures.

Factor 3: Engagement with Studies

Factor 3 is one of a few factor scores that are similar in meaning and composition to NSSE Benchmarks. It consists of three subfactors addressing academic involvement, initiative, research engagement, and collaborative work (Table 3). Engagement with Studies is a factor that is of special interest to faculty as it helps to describe students that many faculty, especially in social sciences and humanities, find to be more challenging and engaging for them as faculty. The scores in Factor 3, like NSSE Benchmarks, tend to favor humanities and social sciences students and to penalize hard science and engineering students.

Factor 5: Development of Scholarship

The majority of items in Factor 5 (see Table 5) were constructed to reflect Benjamin Bloom's taxonomy of educational objectives (1956) and the items are arrayed from lower-order to higher-order thinking skills. Perhaps no other classification scheme has been as influential and continues to contribute to many educational fields (e.g., Zheng et al., 2008 on the content of AP Biology, undergraduate instruction, MCAT, and medical school).

Factor 6: Campus Climate for Diversity

Factor 6 appeared as part of the core factor structure in 2008 when eight items asking about respect for students and freedom for expression of beliefs and ideas were moved from a randomly assigned module to the universally assigned core item set. The subfactor structure is particularly remarkable in that it differentiates between the expression of beliefs, treatment of students for factors perceived to be matters of choice and factors beyond choice (Table 6). For example, items about gender, economic or social class, race and ethnicity and sexual orientation are differentiated from religions and political beliefs. The dual loading of sexual orientation on choice and beyond choice dimensions was interesting and likely reflected society's multiple understandings about the nature of less common sexualities.

Factor 7: Academic Disengagement (Inverted Scale)¹

¹ The computation of Factor 7 scores is somewhat complicated. Throughout the survey, higher values are generally preferred. For example, more satisfaction is better than dissatisfaction. For nearly all the items of this factor, more is not preferred. For example, turning in assignments late more often should be discouraged. That was not true for one item, amount of assigned reading completed. Doing more of the assigned reading is considered to be a good behavior. Therefore, amount of reading was reverse coded to create a scale where higher values are less academically fruitful. That reversal caused all items in this factor to be consistently ordered. However, the resulting factor score was inconsistent with all other factor scores (i.e., 1-6 and 8). To produce a consistently ordered factor score profile in which higher is better, the last step, standardization to a mean of 5 and standard deviation of 2, was done by subtracting the standard deviation of a score from the mean instead of adding it to the mean.

While the concept of Academic Disengagement is straightforward, computing and reporting of Academic Disengagement are more complicated (Table 7). Skipping class, being unprepared, not reading material, partying, and watching TV are all examples of activities that will interfere with academic involvement whether or not they are associated with lower academic performance. A student exhibiting high levels of these behaviors has less time for academic matters. An area of special interest for future research is the presence of activities generally considered to be healthy for students on several levels: exercise, involvement in student clubs and organizations and recreational or creative interests and hobbies.

Factor 8: Quantitative Professions

From its full inception in 2006, the SERU/UCUES questionnaire has been atypical because it has items that better reflect the undergraduate experience of science, business and engineering students (see Table 8). The subfactors are ratings of quantitative skills, both current and gain, and reasons for selecting a major that are reward driven: socially, personally and monetarily.

Factor 9: Time Factor

The items of Factor 9 have never been part of factor solutions. They are items that the first panel, in 2006, judged to be especially important to universities and that needed to be formed according to university interest in student employment and academic time (see Table 9).

References

- B. S. Bloom (Ed.), *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain* (David McKay, New York 1956).
- Chatman, S. P. (2007). A Common Factor Solution for UCUES 2006 Upper-Division Core Items (JAD 5.11.07). Center for Studies in Higher Education. Berkeley, CA.
cshe.berkeley.edu/research/seru/papers/SERU.TechR.FactorAnalysis1.6.20.pdf
- Pike, G. R. (2006). The convergent and discriminant validity of NSSE scalet scores. *Journal of College Student Development*, 47, 550-563.
- Thomson, G. & Douglass, J.A. (2009). Decoding Learning Gains: Measuring Outcomes and the Pivotal Role of the Major and Student Backgrounds. Research and Occasional Paper Series: CSHE.5.09. Center for Studies in Higher Education. Berkeley, CA.
<http://cshe.berkeley.edu/publications/docs/ROPS-GT-JD-Decoding-5-30-09.pdf>
- Zheng, A.Y., Lawhorn, J.K., Lumley, T., and Freeman, S. (2008). Application of Bloom's Taxonomy Debunks the "MCAT Myth." *Science*, 319 (5862), pp. 414 – 415.

Table A: Internal Consistency of Factors and Subfactors (Cronbach Alpha)

	Cronbach's Coefficient Alpha 2006	Cronbach's Coefficient Alpha 2008	Cronbach's Coefficient Alpha 2009
Factor 1: Satisfaction with Educational Experience	0.92	0.93	0.92
Subfactor 1a: Quality of Instruction and Courses in the Major	0.78	0.75	0.76
Subfactor 1b: Satisfaction with Access and Availability of Courses in the Major	0.82	0.84	0.82
Subfactor 1c: Sense of Belonging and Satisfaction	0.83	0.82	0.84
Subfactor 1d: Satisfaction with Advising and Out of Class Contact	0.81	0.83	0.81
Subfactor 1e: Clarity of Program Requirements, Policies & Practices	0.67	0.69	0.64
Subfactor 1f: Satisfaction with Library Support	0.73	0.77	0.76
Factor 2: Current Skills Self-Assessment (Nonquantitative)	0.91	0.91	0.90
Subfactor 2a: Critical Thinking and Communication	0.90	0.88	0.82
Subfactor 2b: Cultural Appreciation and Social Awareness	0.83	0.83	0.83
Subfactor 2c: Computer and Research Skills			0.78
Factor 3: Engagement with Studies		0.88	0.88
F3a: Academic Involvement and Initiative		0.90	0.90
F3b: Research or Creative Projects Experience		0.77	0.75
F3c: Collaborative Work	0.82	0.70	0.75
Factor 4: Gains in Self-Assessment of Skills (Nonquantitative)	0.89	0.89	0.88
Subfactor 4a: Gains in Critical Thinking and Communication	0.85	0.86	0.79
Subfactor 4b: Gains in Cultural Appreciation and Social Awareness	0.78	0.80	0.78
Subfactor 4c: Gains in Computer and Research Skills			0.72
Factor 5: Development of Scholarship	0.85	0.86	0.86
Subfactor 5a: Critical Reasoning and Assessment of Reasoning	0.85	0.87	0.86
Subfactor 5b: Curricular Foundations for Reasoning	0.71	0.75	0.75
Subfactor 5c: Elevated Academic Effort	0.69	0.52	0.52
Factor 6: Campus Climate for Diversity		0.90	0.89
Subfactor 6a: Climate for Personal Characteristics		0.87	0.86
Subfactor 6b: Freedom to Express Beliefs		0.82	0.82
Subfactor 6c: Climate of Respect for Personal Beliefs		0.82	0.81
Factor 7: Academic Disengagement (Inverted Scale)		0.73	0.75
Subfactor 7a: Extracurricular Engagement (Inverted Scale)		0.72	0.72
Subfactor 7b: Poor Academic Habits (Inverted Scale)		0.74	0.75
Subfactor 7c: Non-academic Motivations (Inverted Scale)		0.67	0.65
Factor 8: Quantitative Professions	0.64	0.62	0.61
Subfactor 8a: Career Orientation	0.55	0.60	0.57

Table 2: Factor Two

	2009 UCUES Code	2006	08/09	Principal		Subfactors (Promax)		2009 Subfactors (Promax)		
				2008	08/09	F2a	F2b	F2a	F2b	F2c
2. Please rate your level of proficiency in the following areas when you started at this campus and now.										
Current ability level										
Analytical and critical thinking skills	cruc09_skill_crit_t2	2	2	0.64	0.64	0.65		0.77		
Ability to be clear and effective when writing	cruc09_skill_write_t2	2	2	0.63	0.62	0.65		0.75		
Ability to read and comprehend academic material	cruc09_skill_read_t2	2	2	0.64	0.63	0.67		0.76		
Understanding of a specific field of study	cruc09_skill_mjr_t2	2	2	0.56	0.55	0.63		0.68		
Ability to speak clearly and effectively in English	cruc09_skill_speak_t2	2	2	0.67	0.65	0.66		0.68		
Understanding international perspectives (economic political, social, cultural etc.)	cruc09_skill_ntmat_t2	2	2	0.57	0.57	0.61		0.56		
Leadership skills	cruc09_skill_lead_t2	2	2	0.59	0.56	0.64		0.60		
Computer skills	cruc09_skill_cmptr_t2	2	2	0.56	0.56	0.53				0.81
Internet skills	cruc09_skill_int_t2	2	2	0.61	0.60	0.57				0.82
Library research skills	cruc09_skill_lres_t2	2	2	0.53	0.52	0.60				0.70
Other research skills	cruc09_skill_ores_t2	2	2	0.59	0.58	0.67				0.72
Ability to prepare and make a presentation	cruc09_skill_prsnt_t2	2	2	0.63	0.61	0.69		0.60		
Interpersonal (social) skills	cruc09_skill_soc_t2	2	2	0.57	0.56		0.65		0.51	
3. Similarly, please rate your abilities now and when you first began at this university on the following dimensions.										
Current ability level										
Ability to appreciate, tolerate and understand racial and ethnic diversity	cruc09_able_toler_t2	2	2	0.51	0.49		0.59		0.79	
Ability to appreciate the fine arts (e.g., painting, music, drama, dance)	cruc09_able_arts_t2	2	2	0.50	0.49		0.56		0.71	
Ability to appreciate cultural and global diversity	cruc09_able_globl_t2	2	2	0.54	0.54		0.63		0.86	
Understanding the importance of personal social responsibility	cruc09_able_respn_t2	2	2	0.55	0.57		0.64		0.76	
Self awareness and understanding	cruc09_able_self_t2	2	2	0.58	0.58		0.65		0.64	
Structure										
Factor 2: Current Skills Self-Assessment (Nonquantitative)										
Subfactor 2a: Critical Thinking and Communication										
Subfactor 2b: Cultural Appreciation and Social Awareness										
Subfactor 2c: Computer and Research Skills										

Table 3: Factor 3

	2006	2008	08/09	Principal 2008	08/09	2008 Subfactors (Promax)			2009 Subfactors (Promax)		
						F3a	F3b	F3c	F3a	F3b	F3c
5. How frequently during this academic year have you done each of the following?											
Sought academic help from instructor or tutor when needed	4	3	3	0.40	0.36			0.65			0.64
Worked on class projects or studied as a group with other classmates outside of class	7	3	3	0.32	0.35			0.86			0.85
Helped a classmate better understand the course material when studying together	7	3	3	0.37	0.37			0.84			0.84
6. How frequently have you engaged in these activities so far this academic year?											
Taken a small research-oriented seminar with faculty		3	3	0.54	0.50	0.40	0.56			0.57	
Communicated with a faculty member by email or in person		3	3	0.62	0.61	0.65			0.65		
Talked with the instructor outside of class about issues and concepts derived from a course		3	3	0.69	0.66	0.72			0.69		
Interacted with faculty during lecture class sessions		3	3	0.64	0.63	0.83			0.82		
Worked with a faculty member on an activity other than coursework (e.g., student organization, campus committee, cultural activity)		3	3	0.59	0.59	0.42	0.57			0.55	
7. During this academic year, how often have you done each of the following?											
Contributed to a class discussion		3	3	0.56	0.57	0.83			0.84		
Brought up ideas or concepts from different courses during class discussions		3	3	0.58	0.59	0.84			0.84		
Asked an insightful question in class		3	3	0.61	0.61	0.85			0.86		
Found a course so interesting that you did more work than was required		3	3	0.54	0.50	0.68			0.66		
Chosen challenging courses, when possible, even though you might lower your GPA by doing so		3	3	0.34	0.31	0.46			0.42		
Made a class presentation		3	3	0.49	0.52	0.53		0.40	0.55		
Had a class in which the professor knew or learned your name		3	3	0.60	0.60	0.75			0.74		
12. Indicate the following research and creative activities that you are currently doing or have completed as a UC student.											
At least one student research course (e.g., course 99)	6	3	3	0.35	0.37		0.51			0.51	
At least one independent study course (e.g., 199)	6	3	3	0.43	0.40		0.63			0.59	
Assist faculty in <u>research with course credit</u>	6	3	3	0.40	0.36		0.66			0.65	
Assist faculty in <u>research for pay without course credit</u>	6	3	3	0.32	0.29		0.54			0.53	
Assist faculty in <u>research as a volunteer without course credit</u>	6	3	3	0.38	0.35		0.61			0.59	
Work on <u>creative projects</u> under the direction of faculty <u>with course credit</u>		3	3	0.38	0.36		0.47			0.41	
Work on <u>creative projects</u> under the direction of faculty <u>for pay without course credit</u>		3	3	0.34	0.30		0.55			0.51	
Work on <u>creative projects</u> under the direction of faculty <u>as a volunteer without course credit</u>		3	3	0.41	0.38		0.57			0.53	
20. How many professors do you know well enough to ask for a letter of recommendation in support of an application for a job or for graduate or professional school?	6	3	3	0.57	0.58	0.57			0.58		

Structure

Factor 3: Engagement with Studies

F3a: Academic Involvement and Initiative

Table 4: Factor 4

	2009 UCUES Code	2006	08/09	Principal		2008 Subfactors (Promax)		2009 Subfactors (Promax)		
				2008	08/09	F4a	F4b	F4a	F4b	F4c
2. Please rate your level of proficiency in the following areas when you started at this campus and now.										
Change between self-reported current skill level and skill level at entry										
Analytical and critical thinking skills	cruc09_skill_crit_g	3		0.62	0.62	0.65		0.76		
Ability to be clear and effective when writing	cruc09_skill_write_g	3		0.58	0.55	0.61		0.75		
Ability to read and comprehend academic material	cruc09_skill_read_g	3		0.61	0.60	0.64		0.77		
Understanding of a specific field of study	cruc09_skill_mjr_g	3		0.53	0.54	0.58		0.65		
Ability to speak clearly and effectively in English	cruc09_skill_speak_g	3		0.56	0.52	0.57		0.52		
Understanding international perspectives (economic political, social, cultural etc.)	cruc09_skill_ntrnat_g	3		0.62	0.61	0.63		0.55		
Leadership skills	cruc09_skill_lead_g	3		0.53	0.51	0.55				0.50
Computer skills	cruc09_skill_cmptr_g	3		0.48	0.43	0.50				0.77
Internet skills	cruc09_skill_int_g	3		0.54	0.52	0.56				0.78
Library research skills	cruc09_skill_lres_g	3		0.54	0.52	0.59				0.54
Other research skills	cruc09_skill_ores_g	3		0.57	0.56	0.63				0.60
Ability to prepare and make a presentation	cruc09_skill_prsnt_g	3		0.58	0.56	0.63				0.64
Interpersonal (social) skills	cruc09_skill_soc_g	3		0.54	0.51		0.55		0.54	
3. Similarly, please rate your abilities now and when you first began at this university on the following dimensions.										
Change between self-reported current skill level and skill level at entry										
Ability to appreciate, tolerate and understand racial and ethnic diversity	cruc09_able_toler_g	3		0.57	0.55		0.56		0.74	
Ability to appreciate the fine arts (e.g., painting, music, drama, dance)	cruc09_able_arts_g	3		0.52	0.48		0.52		0.62	
Ability to appreciate cultural and global diversity	cruc09_able_globl_g	3		0.63	0.60		0.62		0.79	
Understanding the importance of personal social responsibility	cruc09_able_respn_g	3		0.61	0.58		0.60		0.71	
Self awareness and understanding	cruc09_able_self_g	3		0.60	0.59		0.61		0.66	
Structure										
Factor 4: Gains in Self-Assessment of Skills (Nonquantitative)										
Subfactor 4a: Gains in Critical Thinking and Communication										
Subfactor 4b: Gains in Cultural Appreciation and Social Awareness										
Subfactor 4c: Gains in Computer and Research Skills										

Table 5: Factor Five

	2006	2008	08/09	Principal		2008 Subfactors (Promax)			2009Subfactors (Promax)		
				2008	08/09	F5a	F5b	F5c	F5a	F5b	F5c
5. How frequently during this academic year have you done each of the following?											
Raised your standard for acceptable effort due to the high standards of a faculty member	4	5	5	0.34	0.34			0.82			0.81
Extensively revised a paper at least once before submitting it to be graded	4	5	5	0.32	0.31			0.82			0.82
16. Thinking back over your coursework this academic year, how often were you REQUIRED to do the following?											
Recognize or recall specific facts, terms and concepts	4	5	5	0.44	0.47		0.81				0.81
Explain methods, ideas, or concepts and use them to solve problems	4	5	5	0.57	0.59		0.87				0.86
Break down material into component parts or arguments into assumptions to see the basis for different outcomes and conclusions	4	5	5	0.72	0.73		0.73				0.74
Judge the value of information, ideas, actions and conclusions based on the soundness of sources, methods and reasoning	4	5	5	0.73	0.75	0.75				0.74	
Create or generate new ideas, products or ways of understanding	4	5	5	0.64	0.63	0.74				0.73	
17. Thinking back on this academic year, how often have you done each of the following?											
Used facts and examples to support your viewpoint	4	5	5	0.56	0.59	0.70				0.70	
Incorporated ideas or concepts from different courses when completing assignments	4	5	5	0.62	0.62	0.77				0.76	
Examined how others gathered and interpreted data and assessed the soundness of their conclusions	4	5	5	0.68	0.69	0.84				0.84	
Reconsidered your own position on a topic after assessing the arguments of others	4	5	5	0.63	0.64	0.80				0.80	

Structure

Factor 5: Development of Scholarship

Subfactor 5a: Critical Reasoning and Assessment of Reasoning

Subfactor 5b: Curricular Foundations for Reasoning

Subfactor 5c: Elevated Academic Effort

Table 6: Factor Six

	2006	2008	08/09	Principal		2008 Subfactors (Promax)			2009 Subfactors (Promax)			
				2008	08/09	F7a	F7b	F7c	F7a	F7b	F7c	
4. Indicate how strongly you agree or disagree with each of the following statements.												
I feel free to express my <u>political beliefs</u> on campus		6	6	0.57	0.60		0.92			0.91		
I feel free to express my <u>religious beliefs</u> on campus		6	6	0.60	0.61		0.91			0.91		
Students are respected here regardless of their <u>economic or social class</u>		6	6	0.73	0.73	0.85			0.86			
Students are respected here regardless of their <u>gender</u>		6	6	0.70	0.70	0.88			0.88			
Students are respected here regardless of their <u>race or ethnicity</u>		6	6	0.75	0.75	0.88			0.88			
Students are respected here regardless of their <u>religious beliefs</u>		6	6	0.79	0.79			0.88			0.86	
Students are respected here regardless of their <u>political beliefs</u>		6	6	0.75	0.75			0.93			0.89	
Students are respected here regardless of their <u>sexual orientation</u>		6	6	0.67	0.66	0.77			0.68			0.76 Dropped from F7c by consensus.

Structure

Factor 6: Campus Climate for Diversity

Subfactor 6a: Climate for Personal Characteristics

Subfactor 6b: Freedom to Express Beliefs

Subfactor 6c: Climate of Respect for Personal Beliefs

Table 7: Factor Seven

	2006	2008	08/09	Principal		2008 Subfactors (Promax)			2009 Subfactors (Promax)		
				2008	08/09	F7a	F7b	F7c	F7a	F7b	F7c
5. How frequently during this academic year have you done each of the following?											
Turned in a course assignment late		7	7	0.37	0.35		0.54				0.48
Gone to class without completing assigned reading		7	7	0.43	0.44		0.82				0.83
Gone to class unprepared		7	7	0.47	0.46		0.86				0.83
Skipped class		7	7	0.48	0.49		0.73				0.67
8. On average, how much of your assigned course reading have you completed this academic year?											
			7		0.43						0.66
15. Were the following factors very important to you in deciding on your major?											
Easy requirements		7	7	0.31	0.31			0.86			0.83
Allows time for other activities		7	7	0.33	0.35			0.86			0.85
21. You told us earlier how much time you spend studying and working in a week. How many hours do you spend on each of these other activities in a typical 7 day week?											
Attending movies, concerts, sports, or other entertainment events		7	7	0.50	0.46	0.65					0.63
Participating in physical exercise, recreational sports, or physically active hobbies		7	7	0.36	0.34	0.56					0.51
Participating in student clubs or organizations		7	7	0.45	0.39	0.42					0.36
Pursuing a recreational or creative interest (arts/crafts, reading, music, hobbies, etc.)		7	7	0.37	0.32	0.54					0.52
Socializing with friends		7	7	0.59	0.61	0.74					0.76
Partying		7	7	0.58	0.61	0.71					0.70
Using the computer for non-academic purposes (games, shopping, email/instant messaging, etc.)		7	7	0.46	0.46	0.49					0.55
Watching TV		7	7	0.37	0.37	0.49					0.54

Structure

Factor 7: Academic Disengagement (Inverted Scale)

Subfactor 7a: Extracurricular Engagement (Inverted Scale)

Subfactor 7b: Poor Academic Habits (Inverted Scale)

Subfactor 7c: Non-academic Motivations (Inverted Scale)

Table 8: Factor Eight

	2006	2008	08/09	Principal		2007 Subfactors (Promax)		2009 Subfactors (Promax)	
				2008	08/09	F8a	F8b	F8a	F8b
2. Please rate your level of proficiency in the following areas when you started at this campus and now.									
Current ability level									
Quantitative (mathematical and statistical) skills	7	8	8	0.56	0.58		0.85		0.84
Change between self-reported current skill level and skill level at entry									
Quantitative (mathematical and statistical) skills	7	8	8	0.37	0.37		0.87		0.86
15. Were the following factors very important to you in deciding on your major?									
Leads to a high paying job	7	8	8	0.50	0.49	0.79		0.78	
Prepares me for a fulfilling career	7	8	8	0.34	0.30	0.69		0.67	
Prestige	7	8	8	0.39	0.34	0.75		0.75	
Structure									

Factor 8: Quantitative Professions

Subfactor 8a: Career Orientation

Subfactor 8b: Quantitative Skills

* Study abroad factor tried and found to reduce reliability

Table 9: Time Factor

	2006	2008	08/09	2008 Subfactors (Promax)		2009 Subfactors (Promax)	
				Fta	Ftb	Fta	Ftb
1. During your TYPICAL 7-day (168 hour) week during the academic term, how many hours do you spend doing the following?							
Attending classes, discussion sections or labs	Ft	Ft	Ft		0.83		0.82
Studying and other academic activities outside of class	Ft	Ft	Ft		0.83		0.83
Paid employment (include paid internships)	Ft	Ft	Ft	0.82		0.82	
Of your total hours spent working for pay, about how many hours did you work on campus?	Ft	Ft	Ft	0.75		0.77	
Of your total hours spent working for pay, about how many hours were related to your academic interests?	Ft	Ft	Ft	0.76		0.77	

Structure

Factor T: Use of Time (Academic and Employment)

Subfactor Ta: Time Employed

Subfactor Tb: Academic Time