

The Retention Management System *Plus*TM Research and Technical Guide

Managing retention requires us to extend our programs, services, and people to the students we are here to serve. When we help our students think through their futures, explore their talents, and learn, the sense of motivation and involvement that is fostered carries them through to the sophomore year and beyond.

Noel-Levitz[®]

Contributors:
Michael L. Stratil, PhD
Laurie Schreiner, PhD
Richard Miller, MA
Elizabeth Herr, PhD
Dan Edstrom, CS

Table of Contents

What is the Retention Management System Plus?	5
What is the historical background of the College Student Inventory?	5
How is the CSI constructed?	6
The Items	6
The Constructs	6
The Motivational Scales	6
The Summary Observations	8
Summary Observations	8
The Norms	8
Reliability	9
Validity	10
Content Validity	11
Inventory Construction	11
Factor Structure	11
Concurrent Validity	16
Correspondence with Admission Decisions	16
Correspondence with Testing Data	18
Predictive Validity	18
The 1991 National Validity Study (CSI–Form A)	20
The 1987 National Validity Pilot Study (CSI – Form A)	26
The 1988-1991 National Validity Study (CSI – Form A)	27
Institution-Specific Predictive Validity (CSI – Form A)	36
The 2001 Validity Study (CSI – Form B)	37
Summary Scales and Average GPA (CSI – Form C)	45
Summary Scales and Academic Risk (CSI – Form C)	48
The Overall Risk Index (CSI – Form C)	52
Relative Predictive Validity of All Scales (CSI – Form C)	53
The Scales and the Risk Score (CSI – Form C)	54
Construct Validity	56
Overview of Theoretical and Empirical Literature	56
Attitude Toward Professors	58
Nelson-Denny Reading Test and Myers-Briggs Type Indicator	59
Pre-College Attributes and Social and Academic Motivation	59
Gender Differences	60
Age Differences	66
The Role of Decision Making in College Student Retention By Herbert Bruce, Ph.D., Director, First-Year Programs, Lynchburg College (VA)	66
The Study	67
Model 1: Base Model With Interactions Terms	68
Model 2: Base Model and Decision Making with Interactions Terms	69
Discussion	72

Policy Implications	73
References	75
Exploratory Study of CSI-A Motivational Styles	77
Overview.....	77
Method.....	79
Factor Analysis	80
Cluster Analysis	80
Results.....	81
Women’s Motivational Styles	83
Men’s Motivational Styles.....	111
Individual Institution Research Studies.....	130
In Summary	130
References	131

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Research and Technical Guide

The pressure is on for institutions to retain and graduate more of their students. Accordingly, pinpointing students' needs, providing timely interventions, accurate record keeping, and greater accountability for student success are common expectations today.

To understand retention fully is to understand that we cannot do anything on a campus that in some way does not affect the institution's ability to retain students. This means we have to think about *how* we bring students to our campus, including the "mind-sets" and expectations we create as we recruit. Then, we must apply *what* we have learned about effective strategies with the students who come to us. Institutions with the best retention rates change student and institutional behaviors in ways that promote student success and retention.

Contrary to popular belief, students don't bring a cogent map of their future to campus. Rather, they need help creating a plan one step at a time. We find there is a tremendous difference between being academically prepared or having the "right" academic credentials and being ready to persist and succeed academically. What works is to provide adequate support early on—and enough to make a difference. By "*front loading*" the first term with the appropriate resources, we can then unlock the academic potential and the capacity for success that each student brings to campus.

In far too many cases, students drop out before the institution is even aware of their needs. Many campuses continue to rely on poor academic performance, spotty attendance, and other visible indicators to trigger early interventions. Unfortunately, these approaches are often too late. With the Retention Management System *Plus* (RMS *Plus*), institutions can now identify dropout-prone students as they walk on campus and put in their path *a prevention plan* before the student experiences the feelings of being lost, confused, overwhelmed, underprepared, and uncertain.

What is the Retention Management System *Plus*?

This assessment tool provides an effective means of promoting the academic and social integration of the student into the campus, and allowing each student to attain the intellectual and personal growth that lies within his or her capacity. The primary purpose of the RMS is to foster effective communication between students and their advisors, a purpose that is accomplished by identifying students' needs, attitudes, motivational patterns, resources, coping mechanisms, and receptivity to intervention.

The four basic components of the RMS that enable institutions to address students' attitudes that lead to attrition are:

The College Student Inventory™ (CSI)

The Advisor/Counselor Report

The Student Report

The Summary and Planning Report

What is the historical background of the College Student Inventory?

The College Student Inventory is the foundation of the RMS and was designed especially for incoming first-year students. There are currently three versions of the CSI—Form A, Form B, and Form C.

Michael L. Stratil, PhD, the author of the CSI, began his research in the area of academic and social motivation with the goals of: 1) creating a coherent framework for understanding human motivation in general; 2) identifying the specific motivational variables that are most closely related to persistence and academic success in college; and 3) developing a reliable and valid instrument for measuring these variables (Stratil, 1988).

As a result of his research, the original version of the CSI (titled the “Stratil Counseling Inventory”) was published in 1984. The current versions of the College Student Inventory—Form A, Form B, and Form C—were published in 1988, 2000, and 2006 respectively. Each of the three versions was developed in response to the specific needs of various student populations.

How is the CSI constructed?

The Items

The CSI–Form A is a 194-item inventory is completed in approximately 50 minutes , whereas the CSI –Form B has 100 items and takes approximately 25 minutes to complete. CSI–Form C features 74 items and requires 15-20 minutes to complete. Both Form A and Form B are available either online or in the paper-and-pencil formats, whereas Form C is available online only. Noel-Levitz offers a Canadian version of the online CSI–Form B, and Spanish variations of CSI Forms A, B, and C.

The Constructs

The scales for each of the three forms of the CSI are grouped by the constructs they represent:

CSI-Form A	CSI-Form B	CSI-Form C
Academic Motivation	Academic Motivation	Academic Motivation
Social Motivation	General Coping Ability	General Coping
General Coping Ability	Receptivity to Support Services	Receptivity to Support Services
Receptivity to Support Services	Internal Validity	
Initial Impressions		
Internal Validity		

The Motivational Scales

The heart of the CSI rests with the independent motivational scales constructed for each of the categories above. The specific scales for Form A, B, and C are as follows:

Academic Motivation		
Form A	Form B	Form C
Study Habits	Study Habits	Study Skills
Intellectual Interests	Intellectual Interests	Reading Habits
Academic Confidence	Verbal and Writing Confidence	Use of Technology
Desire to Finish College	Math and Science Confidence	Verbal Skills
Attitude Toward Educators	Desire to Finish College	Math Skills
	Attitude Toward Educators	Commitment
		Attitude Toward Educators

General Coping Ability

Form A	Form B	Form C
Family Emotional Support	Family Emotional Support	Personal Support
Sense of Financial Security	Sense of Financial Security	Life and Career Planning
Openness	Opinion Tolerance	Financial Security
Ease of Transition	Career Closure	
Career Planning	Sociability	

Receptivity To Support Services

Form A	Form B	Form C
Academic Assistance	Academic Assistance	Academic Assistance
Personal Counseling	Personal Counseling	Career Planning
Social Enrichment	Social Enrichment	Financial Guidance
Career Counseling	Career Counseling	
	Financial Guidance	

Social Motivation

Form A	Form B
Self Reliance	[Sociability appears under General Coping Ability]
Sociability	
Leadership	

Additional Scales

Form A	Form B
Initial Impressions	Internal Validity
Internal Validity	

The Summary Observations

The motivational items, scales, and other self-reported student information are analyzed further to produce summary observations which provide a preliminary overview of a student's level of risk and receptivity.

Summary Observations

Form A	Form B	Form C
Dropout Proneness	Dropout Proneness (four-year colleges/universities) Overall Risk Index (two-year colleges)	Overall Risk Index
Predicted Academic Difficulty	Predicted Academic Difficulty	Acknowledged Academic Needs Index
Educational Stress	Educational Stress	Apprehension Index
Receptivity to Institutional Help	Receptivity to Institutional Help	Receptivity Index

The Norms

The current norms for CSI-Form A, B, and C were developed in 2012, with samples drawn from institutional data collected from 2010 and 2011 with stratification by institutional type – two-year, four-year public, and four-year private. A summary of these normative parameters is shown in Table 1.

Table 1. Summary of normative parameters for CSI-A, B, and C.

CSI-Form A		CSI-Form B		CSI-Form C	
Sample Size	26,909	Sample Size	172,046	Sample Size	10,000
Two-year institutions	1,948	Two-year institutions	35,409	Two-year institutions	5,000
Four-year public institutions	10,142	Four-year public institutions	57,676	Four-year public institutions	5,000
Four-year private institutions	14,819	Four-year private institutions	78,961		
Number of Institutions	91	Number of Institutions	353	Number of Institutions	48
Two-year institutions	14	Two-year institutions	93	Two-year institutions	14
Four-year public institutions	29	Four-year public institutions	102	Four-year public institutions	34
Four-year private institutions	48	Four-year private institutions	158		

Based on these data, all scale scores are reported as either percentiles or stanines, which provide a very solid frame of reference for interpreting the scores of individual students.

Reliability

General statistical principles indicate that, when other factors are held constant, scale reliability tends to increase as scale length increases up to a point of diminishing returns. Throughout the CSI's development, a central goal has been to maximize the homogeneity (internal consistency, reliability) of each scale while keeping the inventory's total length relatively short. To achieve that goal, the research design incorporated the following features:

- A large initial pool of preliminary items for each scale;
- Item testing with large samples;
- An item-selection procedure that reduced content redundancy and maximized inter-item correlations;
- Pilot testing of preliminary scales that resulted in further refinements to the final inventory.

As a result of these procedures, CSI-A's 21 major independent scales have an average homogeneity coefficient (coefficient alpha and Spearman-Brown split-half reliability) of .81 despite an average length of only 7.8 items. CSI-B's 17 major independent scales (with an average length of 5.2) also have an average homogeneity coefficient of .81. The shorter (by 25%) CSI-C's 13 independent scales (with an average length of 4.38) have a slightly lower average homogeneity coefficient of .66. These data are shown in Table 2.

Table 2. CSI Form A, B, and C Homogeneity Coefficients Cronbach Alphas

Independent Scales	Form A Homogeneity Coefficient	Form B Homogeneity Coefficient	Form C Homogeneity Coefficient
Receptivity to Academic Assistance	0.82	0.83	.80
Academic Confidence	0.83	N/A	N/A
Attitude toward Educators	0.84	0.79	0.64
Career Closure	N/A	0.85	N/A
Receptivity to Career Counseling	0.81	0.84	0.84
Career Planning	0.83	N/A	0.73
Commitment	N/A	N/A	0.60
Desire to Finish	0.83	0.83	N/A
Desire to Transfer	0.71	0.77	N/A
Ease of Transition	0.84	N/A	N/A
Family Emotional Support	0.87	0.85	N/A
Receptivity to Financial Guidance	N/A	0.68	0.60
Initial Impressions	0.87	N/A	N/A
Intellectual Interests	0.83	0.83	N/A

Leadership	0.82	N/A	N/A
Life and Career Planning	N/A	N/A	0.68
Math and Science Confidence	N/A	0.78	N/A
Math Skills	N/A	N/A	0.78
Openness	0.72	N/A	N/A
Opinion Tolerance	N/A	0.78	N/A
Personal Counseling	0.80	0.86	N/A
Personal Support	N/A	N/A	0.68
Reading	N/A	N/A	0.77
Self Reliance	0.77	N/A	N/A
Sense of Financial Security	0.81	0.81	0.63
Sociability	0.83	0.76	N/A
Receptivity to Social Enrichment	0.75	0.80	N/A
Study Habits	0.89	0.82	N/A
Study Skills	N/A	N/A	0.44
Technology	N/A	N/A	0.50
Verbal and Writing Confidence	N/A	0.81	0.68
Average Alpha Coefficient	0.81	0.81	0.66
N (Students)	26,909	172,046	55,494
N (Institutions)	91	353	48

As a point of comparison, the Myers-Briggs Type Indicator, often used by college counseling centers, has an average coefficient alpha reliability of .81 and the California Psychological Inventory (CPI) has an average coefficient alpha reliability of .72.

With this solid homogeneity as a base, the CSI-A's stability (test-retest reliability) is also quite good -- the average stability coefficient for the CSI's 19 major scales is .80. The stability coefficient of the Myers-Briggs is .70 and the CPI's test-retest reliability coefficient is .70.

In addition to demonstrating the CSI's reliability, this research brings to light the efficiency with which the CSI measures motivation. Overall, the CSI's reliability appears to be quite similar to that of several leading personality inventories despite its reliance on far fewer items per scale, which contributes to its practicality in many situations (Stratil, 1988).

Validity

Assessing the CSI's validity is an ongoing process. Four major areas of validity are addressed here: content, concurrent, predictive, and construct validity.

Content Validity

Content validity is the degree to which the content of the measurement procedure is directly and obviously relevant to the conceptual definition of the variable that one intends to measure. A measure of arithmetic, for example, possesses content validity to the degree that it requires the person being tested to perform arithmetic operations accurately.

Inventory Construction

A number of methods have been used to build a high degree of validity into the CSI. Rather than rely on post hoc factor analysis to define scales, for example, the items for each scale were written with the express intent of measuring a particular background or motivational variable as accurately as possible. Great care was taken to ensure that the nuances in each item were appropriate to that intent. In addition, a defensiveness scale was used to eliminate items eliciting a tendency to generate falsely positive responses (Stratil, 1984). Through a five-year course of empirical testing, modification and further testing, a concerted effort was made to maximize the discrimination between the scales. As a result of these efforts, all of the CSI's scales have a very high level of content validity (Stratil, 1988).

Factor Structure

The CSI's content validity is evidenced in the relationship between its practical purpose and its factor structure. The general purpose of the CSI is to measure the background and motivational underpinnings of college success. Its primary scales form into factors that accord very closely with that goal. A principal components factor analysis using a varimax rotation extracted six factors with CSI-A. Table 3 reports the results of this analysis, focusing on scales loading at .40 or higher.

Table 3. Factor Structure of CSI-A's Primary Scales

Factor	Major Factor Loadings (absolute value > .40)	Conceptual Relationship with CSI's Primary Purpose
Social Adjustment (SOC)	<p>Four-Year: Sociability (.77), Leadership (.70), Self-Reliance (.70), Ease of Transition (.68) and Openness (.51)</p> <p>Two-Year: Sociability (.80), Leadership (.75), Ease of Transition (.66), Self-Reliance (.64), and Openness (.50)</p>	Social adjustment is widely believed to be an indication of the student's capacity to obtain well-socialized gratifications from campus life and, hence, to find the emotional reserves required for study and persistence; but strong social interest can compete excessively with studying and, hence, impede academic achievement.
Receptivity (REC)	<p>Four-Year: Receptivity to Career Counseling (.77), Receptivity to Social Enrichment (.74), Receptivity to Academic Assistance (.63), Receptivity to Personal Counseling (.46*)</p> <p>Two-Year: Receptivity to Social Enrichment (.76), Receptivity to Career Counseling (.73), Receptivity to</p>	Receptivity to institutional assistance is believed to be an indication of the needy student's capacity to accept the reality of his or her needs and a foundation of self-esteem that allows him or her to accept outside influence; but low need can be a favorable indication in students with strong academic records.

	Receptivity to Financial Guidance(.70) Receptivity to Academic Assistance(.65) Receptivity to Personal Counseling(.59)	
Academic Competence (COMP)	<p>Four-Year: Sense of College Preparation (item 5 [academic knowledge] and item 9 [academic ability]) (.82), self-reported senior year high school grades (.72), Academic Confidence (.53), and Receptivity to Academic Assistance (-.53)</p> <p>Two-Year: Sense of College Preparation (item 5 [academic knowledge] and item 9 [academic ability]) (.77), self-reported senior year high school grades (.71), Academic Confidence (.55), and Receptivity to Academic Assistance (-.53)</p>	Academic competence is related to the student's intellectual capacity to cope with the breadth and complexity of information involved in a college education. Note: This factor is a combination of actual competence (as demonstrated by high school performance) and the student's sense of competence.
Academic motivation (MOT)	<p>Four-Year: Study Habits (.69), Intellectual Interests (.68), Attitude toward Educators (.65), and Receptivity to Career Planning (.57), and Desire to Finish (.48*)</p> <p>Two-Year: Intellectual Interests (.79), Study Habits (.66), Attitude toward Educators (.59), Openness (.59), and Desire to Finish (.58), and Academic Confidence (.51)</p>	Academic motivation is related to the student's capacity to develop and maintain long-term goals that provide broad self-direction to the student's work, to obtain immediate gratifications from the learning process, and to maintain daily self-discipline in the pursuit of immediate academic success.
Family support (FAM)	<p>Four-Year: Financial Security (.77), Receptivity to Financial Guidance (-.66), and Family Emotional Support (.59)</p> <p>Two-Year: Financial Security (.76) and Family Emotional Support (.68)</p>	Family background is widely believed to contribute to the student's core self-esteem and sense of security, and, hence, the capacity to recover from defeats and overcome obstacles. Note: This factor is most heavily weighted on financial concerns, suggesting that scores primarily indicate the student's belief that he or she can count on financial support from his or her family. Financial problems hinder a student by arousing distracting anxieties and feelings of inferiority.
Attitude Toward the Institution (ATT)	<p>Four-Year: Transfer Proneness (-.88) and Initial Impressions (.77)</p> <p>Two-Year: Transfer Proneness (-.86) and Initial Impressions (.77)</p>	Attitudes toward the student's institution are believed to relate to the student's general feelings of attraction or aversion that affect persistence and sense of well-being. It is essential to recognize that this factor derives from two underlying motivational forces: (a) the degree of actual fit between the student and the institution, and (b) the student's

general attitude toward the world (friendly, trusting, and optimistic vs. hostile, distrusting, and pessimistic). It is believed that many (but not all) of the students with very low scores on this factor are generally unhappy with multiple issues. Such unhappiness tends to sour them on any environment in which they find themselves, which undermines their achievement.

*Marginal loadings (absolute value greater than or equal to .4 and less than .5).

A similar factor analysis of CSI-B also yielded six factors. These factors were generally similar to those obtained with CSI-A, but some differences were also found due to differences in the scales comprising each. Table 4 reports the results of this analysis.

**Table 4. Factor Structure of CSI-B's Primary Scales
Four-Year Colleges**

Factor	Major Factor Loadings (absolute value > .40)	Conceptual Relationship with CSI's Primary Purpose
Social Adjustment (SOC)	Sociability (.85) and Opinion Tolerance (.42*)	Social adjustment is widely believed to be an indication of the student's capacity to obtain well-socialized gratifications from campus life and, hence, to find the emotional reserves required for study and persistence; but excessive social interest can compete with studying and impede achievement.
Receptivity (REC)	Receptivity to Career Counseling (.77), Receptivity to Social Enrichment (.73), Receptivity to Academic Assistance (.68), Receptivity to Personal Counseling (.42*)	Receptivity to institutional assistance is believed to be an indication of the needy student's capacity to accept the reality of his or her needs and a foundation of self-esteem that allows him or her to accept outside influence; but low need can be a favorable indication in students with strong academic records.
Academic Competence (COMP)	Sense of College Preparation (item 3 [academic knowledge] and item 8 [academic ability]) (.78), self-reported senior year high school grades (.70), Math and Science Confidence (.69), and Receptivity to Academic Assistance (-.45*)	Academic competence is related to the student's intellectual capacity to cope with the breadth and complexity of information involved in a college education. Note: This factor is a combination of actual competence (as demonstrated by high school performance) and the student's sense of competence.
Reading Motivation (READ)	Intellectual Interests (.81), Verbal and Writing Confidence (.74), and Study Habits (.42*)	Reading motivation is focused on a primary mode by which students acquire formal information in college: reading. This factor focuses on the student's capacity to obtain immediate gratifications from this process. Having an interest in intellectual material and feeling confident of one's ability to understand and retain it enhances one's motivation to study. Note: Many items on the Study Habits scale also focus on the reading process.
Family Support (FAM)	Financial Security (.67), Family Emotional Support (.65), Attitude toward Educators (.54), Receptivity to Personal Counseling (-.48*), Receptivity to Financial Guidance (-.43*)	Family background is widely believed to contribute to the student's core self-esteem and sense of security, and, hence, the capacity to recover from defeats and overcome obstacles. Notes: (a) This factor is most heavily weighted on financial concerns, suggesting that scores primarily indicate the student's belief that he or she can count on financial support from his or her family. Financial problems hinder a

		student by arousing distracting anxieties and feelings of inferiority. (b) Attitude toward Educators appears to relate to this general dimension due to students' perception of educators "parent-like" role today.
Career Commitment (CAR)	Career Closure (.76), Transfer Proneness (-.59), and Desire to Finish (.55)	Career Commitment is believed to relate to the student's capacity to sustain his or her academic motivation based on the expectation of significant long-term financial and self-esteem rewards.

*Marginal loadings (absolute value greater than or equal to .4 and less than .5).

It can be seen from Tables 3 and 4 that the obtained factors relate very closely to the CSI's general purpose.

These analyses clarify the structural relationships between the different versions. CSI Forms A and B load on factors involving (a) social adjustment, (b) receptivity to institutional assistance, (c) academic competence, and (d) family support as they pertain to college success. These four factors represent the primary continuities between the two forms. It should be noted, however, that the social adjustment factor in Form B is somewhat narrower than in Form A due to the elimination of several of its scales.

CSI Forms A and B differ primarily in how they structure academic motivation and attitudes toward the institution.

Consider first the area of academic motivation. The partition of the Academic Confidence scale into two separate scales (Math and Science Confidence and Verbal and Writing Confidence) has had an appreciable impact on factor structure. Even though the wording of both scales emphasizes the academic confidence, Math and Science Confidence is weighted primarily on the competence factor and Verbal and Writing Confidence is weighted primarily on the new factor of reading motivation. This finding suggests that many students feel much more comfortable with verbal activities than mathematics and science because verbal activities are more closely related to everyday life. By contrast, they appear to experience mathematical and scientific activities as more specialized, erudite, and challenging. As a result, their attitudes toward this area load more heavily on the general confidence factor. Although it is true that some students may experience the two scales quite differently, the majority appear to organize their attitudes along the lines described in the factor weightings.

The second factor change from Form A to B occurs in the social relations area. In order to obtain a shorter instrument capable of being used where time constraints prevent use of CSI-A, the CSI-B omits the Initial Impressions scale and several social relations scales (Self-Reliance, Leadership, and Ease of Transition). As a result of the first omission, the attitudes toward the institution disappears as a separate factor because the Transfer Proneness scale cannot by itself sustain the factor.

A new factor, career commitment, emerges from the above changes introduced in CSI-B. The emergence of this new factor does not imply that a new conceptual dimension has been introduced; only that it is given more weight in CSI-B. Given that Career Closure is a replacement for Career Planning, the scales in this factor are essentially unchanged; it is

only the way they emerge in the factor analysis that has changed due to the new alignments of other scales.

Overall, both forms show very clear conceptual relationships with the CSI's general goal of measuring background and motivational factors related to college success. They possess significant overlap in their content, and the changes merely reflect different emphases. Therefore, these analyses demonstrate the strong content validity of both CSI-A and CSI-B.

In Form C, care was taken to retain those scales from CSI-A and CSI-B that reflect general student motivation and add several new scales which reflect the specific challenges and concerns of adult learners. These new scales include financial security, life and career planning, and personal support. Additional scales assess the student's comfort and proficiency in areas of math, reading, verbal, and technology skills. Some scales assess the student's readiness for college-level work, such as commitment, attitude toward educators, and study skills. The student's receptivity to assistance in various areas of the college experience is assessed in the scales measuring receptivity to academic assistance, financial guidance, and life and career planning. The factor analysis reinforced and supported these scales.

Concurrent Validity

An instrument's concurrent validity is the degree to which its measurements correspond to the measurements provided by other instruments of known validity. The term concurrent implies that the two sets of instruments are administered during the same period of time so that extraneous causal variables do not contaminate their relationship.

Correspondence with Admission Decisions

The first study of concurrent validity examined involves an assessment made by the student's institution. One can conceptualize an institution's admissions procedures as constituting a systematic method of assessing student preparedness for college. This procedure consists of examining a set of students' aptitude test scores, high school records of performance and extracurricular activity, and recommendations by teachers and others. A decision is then made as to the students' fitness to meet the institution's academic standards. These decisions can thus serve as a concurrent standard against which a psychometric instrument can assess its validity.

Based on these premises, Morrison's (1999) research on the CSI-A can be considered a study of concurrent validity. She compared the CSI-A's scale scores for a group of conditionally-admitted students ($n = 46$) at a private comprehensive liberal arts college with the scores for the general freshman class ($n = 874$). (Note: The total student freshman population was $N = 1000$; some freshmen did not take the CSI-A). The assumption is that the conditionally-admitted students were academically less prepared than the rest of the freshman population. If the CSI-A is valid, then scores of the conditionally-admitted students should be less favorable than those of the overall freshman class.

The results of her analysis are reported in Table 5 (adapted with permission from Morrison, 1999). Out of the 17 scales examined, 13 of the comparisons were statistically significant at $\alpha = .05$. Eleven of these comparisons were consistent with Morrison's hypotheses. All five of the comparisons in the area of academic motivation (Study Habits, Intellectual Interests, Academic Confidence, Desire to Finish, and Attitudes toward Educators) were

significant and concordant with predictions. Of the four scales not showing a significant difference, three were in the area of social adjustment (Self-Reliance, Sociability, and Ease of Transition) and one involved Receptivity to Career Counseling. The emphasis on academic motivation in these findings is consistent with the fact that the admissions process probably weighted high school academic performance and test scores more heavily than social and career-decision variables.

Morrison (1999) had predicted that the conditional admits would be lower on receptivity to academic assistance and receptivity to personal counseling. But the scores on these scales are, in fact, often associated with greater student need for assistance. For example, Stratil's exploratory study reported later in this manual (N = 4088) found a correlation of $-.17$ between cumulative freshman GPA and Receptivity to Academic Assistance, and it found a correlation of $-.07$ between cumulative freshman GPA and Receptivity to Personal Counseling.

In general, the performance implications of receptivity scales are complex and multidimensional. Theoretical considerations suggests that receptivity scores are indications of at least three underlying motivational components: (a) the degree of objective need in the area, (b) the degree of openness to acknowledging whatever need exists, and (c) the degree of willingness to cope actively and constructively with whatever need exists. The higher scores of the conditional admits may reflect the (a) component--their higher than average level of need. By contrast, the stronger members of the general freshman class may have scored lower on these scales because they did not perceive themselves as having needs in the areas involved. It should also be noted that wording of the receptivity items usually focuses on the student's "interest" in receiving a given kind of service. Students are not likely to be interested in types of assistance they feel they do not need.

Table 5. Comparison of Conditional Admits and All Freshmen At Private Four-Year Liberal Arts College¹

CSI-A Scale	All Conditional Admits (n = 46)	Local Mean of All Freshmen Taking CSI (n = 874)	Z*	Percentage of Conditional Students Below Local Mean of Freshmen Population
Academic Motivation				
Study Habits	36.0	56.2	-3.9*	72%
Intellectual Interests	35.1	54.9	-3.9*	74%
Academic Confidence	39.6	62.9	-4.5*	75%
Desire to Finish College	35.6	51.0	-3.6*	74%
Attitude toward Educators	43.2	54.5	-2.3*	66%
1. Social Motivation				
Self-Reliance	44.6	47.0	-0.5	52%
Sociability	57.4	52.0	1.0	37%
Leadership	46.9	57.6	-2.2*	56%

2. General Coping				
Ease of Transition	47.6	46.4	0.3	47%
Family Emotional Support	43.4	57.7	-3.0*	61%
Openness	41.5	50.0	-1.7*	72%
Career Planning	30.0	39.8	-2.1*	63%
Financial Security	50.9	57.9	-1.8*	54%
Receptivity				
Academic Assistance	50.3	32.9	3.6**	26%
Personal Counseling	48.7	37.6	2.5**	37%
Social Enrichment	32.4	42.4	-2.4*	72%
Career Counseling	46.5	43.3	0.9	44%

[†]Table adapted from Morrison, B. (1999). Acknowledging student attributes associated with academic motivation *Journal of Developmental Education*, 23, 10-31.* alpha (1-tailed) = .05. ** These differences were statistically significant with a 2-tailed alpha = .05 (see discussion in text).

Correspondence with Testing Data

Stratil (1988) conducted a study of the relationship between high school grades and admissions test scores reported by students on the CSI and their actual grades and test scores. The CSI's self-report measure of senior year high school grades correlated .72 with the grades appearing on high school transcripts. The self-report measure of ACT scores correlated .91 with actual ACT composite scores, and the self-report measure of SAT scores correlated .75 with the actual SAT total score. These findings suggest that the students taking the CSI are fairly accurate in remembering and reporting their high school grades and academic aptitude scores.

Predictive Validity

Predictive validity involves the degree to which a measurement taken of a given process at a given point in time predicts a measurement of some derivative process at a later point in time. Usually the two measurements are taken in situations where one or more forces of change are believed to operate. One expects a given entity (e.g., a motivational trait) to interact with a given set of other entities (e.g., a new social environment, a new set of intellectual demands). The researcher is hypothesizing that the initial entity is sufficiently distinct and robust as to be capable of interacting with the new environment in a coherent, stable manner—that is, capable of generating a set of distinct effects readily traceable back to the initial entity.

In a simple situation involving a very stable entity, this prediction is easy to confirm. For example, one might wish to validate a device for measuring the mass of a cue ball. One might measure the cue ball's mass, roll the ball down an incline, and then measure its mass again. The first measurement is likely to be an extremely accurate prediction of a second measurement taken after the ball has completed its roll because the variable being measured is relatively simple (at least on earth) and the intervening forces are minimal. But suppose the situation involves a much more powerful set of intervening factors, such as exposure to temperatures varying from 100 to 400 degrees Fahrenheit and a wind tunnel blowing varying mixtures of hydrocarbon vapor at 200 miles per hour. Predicting the final mass of the cue ball from its initial measurement would be much more difficult. Predictive validity in the latter type of situation is a very challenging criterion to meet.

These principles of measurement can be applied to the type of situation of interest here. The CSI is a psychometric instrument designed primarily to measure the motivational traits and social background factors related to student academic outcomes. It was designed primarily to assist advisors and counselors in rapidly gaining an understanding of a student's attitudes toward the self, the educational process, and her or his institution. If each of the traits it measures is considered a distinct entity, and if these entities interact with one another within the primary system (i.e., the student), then it is clear that the situation is a very complex one. The initial entities certainly do not possess sharp, stable boundaries. They can be expected to change, in some cases substantially, over the course of the study. In addition, they can be expected to interact with one another during this period. Furthermore, they can be expected to interact with a large array of environmental variables during the study. Moreover, their interactions with one another will influence how they interact with the environment.

Added to the above complexity is another measurement problem that arises in studying persistence. Freshman GPA, which is often studied in educational research, is a fairly unambiguous outcome variable. Grades are a good indicator of the amount learned. But persistence at a given institution is quite a different matter. It can be compared to studying the simple persistence of patients in a hospital without regard to their reason for leaving. That is, suppose a medical researcher conducts a study of the predictive validity of a set of patient factors in predicting continued patient residence in the hospital after a two-week delay. The researcher gathers data on patient blood pressure, skin condition, blood chemistry, breathing, heart rate, and so forth at time one. Then the researcher returns two weeks later and ascertains whether the patient is still residing in the hospital, which is the dependent variable. This research design has a very serious flaw: Some patients will leave the hospital because they have recovered from whatever illness they had, but others will leave because they died! If the researcher does not take this fundamental differentiation of outcome into account, the results of the study will be very difficult to interpret.

Yet in conducting research on student outcomes, we are often reduced to designs comparable to the one described above. It is very appealing to think that students leave an institution because there is a problem. If we adopt this premise, indications of pre-existing problems ought to predict the problems existing after a given period (e.g., one year of study). But the truth is that students leave college for a wide variety of reasons. Although some of these reasons are related to problems (poor grades, discouragement, failures in social adjustment), students also leave because of success. They may have demonstrated their ability to do college work to themselves, to their parents, and to the admission officers at other institutions. They may have made significant progress in attaining career closure and have decided to transfer to another institution that offers a major not offered by their initial institution. They may have developed a solid emotional relationship with a student at another institution, leading them to transfer. A family member may have fallen ill, and the student may have decided to stop out so as to help that person. Thus, one cannot assume that leaving a given institution should be clearly and directly related to the types of motivational and background factors measured by the CSI. In a typical population of freshman, those leaving for favorable reasons will counterbalance to an unknown extent those leaving for unfavorable reasons.

The problems of studying persistence have been aptly summarized by Turnbull (1986):

Everyone who works with students knows how varied their circumstances are, how different their goals, and how individualized their reasons for staying in postsecondary education or dropping out. This diversity makes it extraordinarily difficult to grapple with the problem of attrition, either theoretically or practically. Further, attrition itself means many different things. It is a term used to cover students who have gotten what they came to college for and left, or students who discovered a different institution better prepared to offer what they wanted and transferred, or students who flunked out. Including all these components under one term creates a recipe for confusion. (p. 6)

While this principle is very clear when stated in the above terms, often the constraints of working in a field setting force us to deal with data that are more ambiguous than we would like. Unfortunately, the persistence data available for this report fit that category: they do not provide a basis for partitioning leaving behavior into its various subtypes. As a result, they contain a significant confounding of favorable and unfavorable types of departure. In trying to interpret these data, we might be inclined to assume that the ratio of unfavorable causes of student departure probably outweigh the favorable ones. That assumption is likely to be accurate to some degree, so that the findings reported here probably underestimate the true relationships between the CSI and unfavorable types of leaving.

Although that assumption is probably accurate to some degree, we must not ignore the confounding that inevitably occurs with such a methodology. The research on persistence reported here does not partition leaving behavior into its various subtypes, so that this confounding is a significant attenuating factor.

We must also keep in mind the complexity of the processes involved in persistence. As described above, motivational traits interact with one another in ways that preclude simple linear relationships between predictor and outcome variables. As a way of dealing with the issue of trait interactions, a study will be reported later that identifies motivational styles based on cluster analysis. It examines the relationship between these configurable styles and various concurrent and outcome variables.

The 1991 National Validity Study (CSI–Form A)

Some evidence of the CSI-A's predictive validity is found in an analysis of covariance conducted by Laurie Schreiner comparing the CSI-A scale scores of persisters and leavers. This study was conducted with the 1991 data set using high school GPA as the covariate. The results indicated that there is indeed a significant difference in nine of the scale scores between these two groups ($p < .001$; see Table 6). Students who did not persist into their second year had significantly higher Dropout Proneness scale scores, lower Desire to Finish College, lower levels of Family Emotional Support and Financial Security, a poor Initial Impression, a lower Receptivity to Social Enrichment, a lower Receptivity to Career Counseling and a stronger Desire to Transfer than those who did persist.

Table 6. Summary of Analyses of Covariance Comparisons of Persisters' and Dropouts' CSI Scale Scores

Source	SS	df	MS	F
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Desire to Finish College					
	Covariate	4174.59	1	4174.59	42.73***
	Main Effect	6941.57	1	6941.57	71.05***
	Explained	12825.06	2	6412.52	65.64***
	Residual	472667.58	4838	97.70	
	Total	48549.64	4840	100.31	
Family Support					
	Covariate	7224.35	1	7224.35	53.34***
	Main Effect	2640.36	1	2640.36	19.50***
	Explained	11285.86	2	5642.93	41.66***
	Residual	653218.78	4823	135.44	
	Total	664504.63	4825	137.72	
Sense of Financial Security					
	Covariate	621.12	1	621.12	13.70***
	Main Effect	1662.24	1	1662.24	36.66***
	Explained	2048.00	2	1024.50	22.59***
	Residual	211127.14	4656	45.34	
	Total	213176.13	4658	45.77	
Initial Impression					
	Covariate	7395.80	1	7395.80	46.75***
	Main Effect	10012.93	1	10012.93	63.29***
	Explained	20126.19	2	10063.10	63.61***
	Residual	770785.52	4872	158.21	
	Total	790911.71	4874	162.27	
Receptivity to Career Counseling					
	Covariate	18.55	1	18.55	.36
	Main Effect	449.37	1	449.37	8.64**
	Explained	451.43	2	225.71	4.34**
	Residual	253441.51	4872	52.02	
	Total	253892.94	4874	52.09	
Source	SS	df	MS	F	
Receptivity to Social Enrichment					
	Covariate	335.29	1	335.29	12.23**
	Main Effect	762.21	1	762.21	27.79**

Explained	1258.56	2	629.28	22.95***
Residual	133613.54	4872	27.43	
Total	134872.11	4874	27.67	
Study Habits				
Covariate	75195.64	1	75195.64	469.36***
Main Effect	1730.10	1	1730.10	10.80***
Explained	81664.79	2	40832.39	254.87***
Residual	765640.04	4779	160.21	
Total	847304.83	4781	177.22	
Desire to Transfer				
Covariate	506.95	1	506.95	29.74***
Main Effect	2350.14	1	2350.14	137.86***
Explained	3203.78	2	1601.89	93.97***
Residual	78248.19	4590	17.05	
Total	81451.96	4592	17.74	
Dropout-Proneness				
Covariate	2056.03	1	2056.03	803.69***
Main Effect	109.97	1	109.97	42.99***
Explained	2338.91	2	1169.46	457.14***
Residual	12463.68	4872	2.56	
Total	14802.59	4874	3.04	

** p < .01

***p < .001

The 1999 National Validity Study (CSI–Form A)

In the 1999 study conducted by Stratil, the ability of CSI-A to predict persistence was analyzed separately at two-year and four-year institutions. An ANOVA was performed for each CSI-A scale comparing persisters and leavers.

The results are shown in Table 7. The direction of the means is indicated under the F-ratio: the word High indicates that persisters were higher than leavers, and Low indicates that persisters were lower than leavers.

Table 7. Effectiveness of CSI-A Scales in Predicting Persistence

Scale	Two-Year Schools (N = 968)	Four-Year Schools (N = 4098)
	ANOVA	ANOVA

	F-ratio	p	F-ratio	p
Academic Motivation				
Study Habits	7.95 High	0.005	21.50 High	0.0000
Intellectual Interests	0.54	ns	0.05	ns
Academic Confidence	4.93 High	0.03	3.56	ns
Desire to Finish College	0.00	ns	59.36 High	0.0000
Attitudes toward Educators	0.04	ns	14.06 High	0.0002
Self-Rated Academic Ability	7.73 High	0.006	31.29 High	0.0000
Self-Rated Academic Knowledge	9.20 High	0.003	47.09 High	0.0000
Social Motivation				
Self-Reliance	0.01	ns	0.94	ns
Sociability	0.02	ns	7.88 High	0.005
Leadership	0.00	ns	7.42 High	0.007
General Coping				
Ease of Transition	0.02	ns	15.70 High	0.0000
Family Emotional Support	2.11	ns	25.11 High	0.0000
Openness	0.13	ns	0.72	ns
Career Planning	2.01	ns	4.43 High	0.04
Sense of Financial Security	5.73 High	0.02	42.08 High	0.0000
Receptivity				
Academic Assistance	18.74 Low	0.0000	1.73	ns
Personal Counseling	1.83	ns	4.47 Low	0.04

Financial Guidance	2.92	ns	3.20	ns
Social Enrichment	4.02 Low	0.05	26.13 High	0.0000
Career Counseling	5.95 Low	0.02	4.15 High	0.05
Miscellaneous				
Initial Impression	0.05	ns	42.19 High	0.0000
Transfer Proneness	3.83 Low	0.05	51.18 Low	0.0000
Senior Year High School Grades (4-point scale)	23.3 High	0.0000	158.68 High	0.0000
Composite Scales				
Dropout Proneness	15.16 Low	0.0001	84.36 Low	0.0000
Predicted Academic Difficulty	18.37 Low	0.0000	22.25 Low	0.0000
Educational Stress	0.99	ns	12.64 Low	0.0004
Receptivity to Institutional Assistance	16.43 Low	0.0000	0.66	ns

Overall, there were 10 primary and three composite scales that predicted persistence at two-year schools. In the area of *academic motivation*, Study Habits, Academic Confidence, self-rated academic ability, and self-rated academic knowledge were significant. None of the social motivation scales was significant. In *general coping*, Sense of Financial Security was significant. Three scales were significant in the area of *receptivity*: Academic Assistance, Social Enrichment, and Career Counseling. Two additional miscellaneous scales were significant: transfer proneness and senior year high school grades. Three of the four composite scales were significant at two-year schools: Dropout Proneness, Predicted Academic Difficulty, and Receptivity to Institutional Assistance. The direction of the means is consistent with theoretical expectations. Persisters were higher than leavers on all of the scales involving academic motivation, high school grades, social motivation, and general coping. By contrast, persisters were lower than leavers on transfer proneness and all scales involving receptivity to institutional support. *The latter supports the premise that the receptivity scales indicate both need and willingness to accept help.* Finally, persisters were lower than leavers on the three significant composite scales, which were designed to detect adverse overall indications. Thus, the results strongly support the predictive validity of CSI-

A by showing that a number of scales predict persistence at two-year schools and that they do so in a direction consonant with theoretical principles.

At four-year schools, 17 primary scales and three composite scales predicted persistence. In the area of *academic motivation*, Study Habits, Desire to Finish College, Attitude toward Educators, self-rated academic ability, and self-rated academic knowledge were significantly related to persistence. Unlike at two-year schools, two *social motivation* scales were predictive: Sociability and Leadership. There were four *general coping* scales that predicted persistence: Ease of Transition, Family Emotional Support, Career Planning, and Sense of Financial Security. Three *receptivity* scales were predictive: Personal Counseling, Social Enrichment, and Career Counseling. Among the *miscellaneous* scales, Initial Impression, Transfer Proneness, and senior year high school grades were predictive. Among *composite* scales, three predicted persistence: Dropout Proneness, Predicted Academic Difficulty, and Educational Stress. Again, persisters were higher than leavers in the areas of academic motivation and general coping. They were also higher in social motivation. The pattern is more complicated in the area of receptivity. Persisters were lower in Receptivity to Personal Counseling (consistent with expectation), but they were higher in Receptivity to Social Enrichment and Receptivity to Career Counseling. In the miscellaneous area, persisters were higher in Initial Impression and senior year grades and lower in Transfer Proneness. Persisters were lower than leavers on the three composite scales.

In general, the pattern of results at four-year schools is quite consistent with the two-year pattern except in the areas of social motivation and receptivity. It may be that the motivational dynamics of social integration are somewhat different at four-year than at two-year institutions. Such differences might be expected from the fact that most students are living away from their home communities at four-year schools, whereas most are living at home at two-year schools. Thus, the four-year students are uprooted and faced with the problem of integrating themselves into a new community. Approached from the perspective of problem-solving skills, one might assume that persisters are more effective at recognizing and taking active measures to resolve problems. Therefore, they are more inclined to desire social enrichment during the beginning months of their arrival at college as a means of resolving the problem of social integration. By contrast, persisters at two-year schools face a much less daunting social integration task because they already have a network of friends and family in the community. In such a situation, the students most interested in social enrichment may be somewhat socially isolated, which would reflect a greater likelihood of inadequate social problem solving in the past. Thus, their problem-solving skills might be more limited than those who do not seek much social integration at two-year schools.

Regarding Receptivity to Career Counseling, the reversed pattern of findings between two-year students (persisters are low) and four-year students (persisters are high) is a more ambiguous issue. It could be that the shorter-lasting and more specialized program options offered by two-year schools leads to the more occupationally mature students arriving with clearer goals. By contrast, there is a much broader range of program options available at four-year schools, and these programs provide greater occupational generalizability. Therefore, four-year students again face a more daunting problem-solving task upon entry into college. Proceeding again on the assumption that persisters are generally more skilled in problem-solving than are leavers, one would expect them to take a more active, open

approach to the task of deciding on a career goal. This would lead persisters at four-year schools into career counseling as one of several fruitful paths toward problem resolution.

Thus, the results for the four-year students add additional support to the predictive validity of CSI-A, with the proviso that further research is needed to clarify the differences in social integration and career development processes at two- and four-year institutions.

Overall, this study of persistence strongly supports both the predictive and construct validity of CSI-A. The pattern of findings is closely, if not perfectly, in accord with theoretical expectations. But it is important to recognize that, from a practical perspective, CSI-A's capacity to correctly classify persisters and leavers is not as great as the above results might suggest. This is true because the magnitudes of the differences between persisters and leavers is often not especially large. It is here that the earlier discussion of the confounding of favorable and unfavorable causes of leaving applies. One can hypothesize that the CSI would be more effective in predicting persistence and leaving if a more sophisticated research design were implemented that distinguished between leaving for favorable and unfavorable reasons.

The 1987 National Validity Pilot Study (CSI – Form A)

Using the CSI's pilot version, this research investigated dropout-proneness with 3,048 first-year college students. The students were divided into four groups, depending on whether or not they remained in school and whether or not they had obtained a GPA of at least 2.0. Standard (z) scores were computed for each group on all scales of the CSI. Significant differences between persisters and leavers, regardless of GPA, were found in Desire to Finish College. This finding indicates that the desire to finish scale was an effective predictor of enrollment status for both the academically successful and the unsuccessful. Significant differences were also found between the academically successful students and academically unsuccessful students, regardless of enrollment status. These two groups differed on four scales: Study Habits, Intellectual Interests, Academic Confidence and Attitude Toward Educators. Since theory would lead one to expect these scales to be related to academic performance, this pattern offers evidence of their predictive validity (Stratil, 1988).

A second aspect of this validity study correlated first-semester, first-year student grades with each scale. First-semester GPA were significantly correlated with scores on the following scales: Study Habits, Academic Confidence, Desire to Finish College, Attitude Toward Educators, Openness, self-reported SAT/ACT scores and self-reported high school GPA. These results formed the basis for the CSI's global predictor of academic difficulties.

The Dropout Proneness Scale was derived empirically from data collected in the study. Through a series of multiple regression analyses, poor predictor variables were dropped from further consideration. The final analysis contained eight predictors and yielded a multiple r of .301 ($p < .001$). A prediction equation was derived from this analysis, which, when applied to the original data, yielded a correlation of .245 ($p < .001$) with the criterion of enrollment status at the end of the first semester. Although the probability levels of both of these coefficients are very high, the results also indicate that the final equation will not be very accurate in predicting who will drop out during the first semester of college. As the number of dropout students increases over a four-year (or two-year) period, one may expect the equation's performance to improve (Stratil, 1988). It should also improve when tested with a design that distinguishes between various types of leaving.

The 1988-1991 National Validity Study (CSI – Form A)

In a study conducted by Schreiner, 46 colleges and universities were selected to participate in research on the validity of the newly revised CSI beginning in the fall of 1988. These institutions administered the CSI to 4,915 students within the first weeks of the term and sent completed CSI forms to the publisher for scoring. In the fall of 1989 each institution supplied information regarding each CSI respondent's cumulative GPA, credit hours attempted, credit hours completed, terms of enrollment, and current enrollment status. Table 8 contains descriptive information regarding this sample.

Table 8. Summary of Characteristics of the Sample of CSI Respondents

Variable	Percentage	n
Type of Institution		
Public	39%	18
Private	61%	28
Highest Degree Offered		
AA/AS	33%	15
BA/BS	33%	15
MA/MS	26%	12
Ph.D.	9%	4
Total Enrollment		
Less than 1,000	35%	16
1,000 to 4,999	46%	21
5,000 to 9,999	15%	7
Over 10,000	4%	2

Average ACT/SAT Scores of Entering Class		
ACT > 26; SAT > 1100	0%	0
ACT 22 - 25.9; SAT 931 - 1099	20%	9
ACT 18 - 21.9; SAT 800 - 930	37%	17
ACT 15 - 17.9; SAT 700 - 799	22%	10
ACT < 15; SAT < 700	7%	3
No response	15%	7
Enrollment Status After One Year		
Enrolled	69.6%	3,422
Academically Dismissed	2.5%	122
Stopped Out	1.4%	68
Transferred	5.1%	252
Withdrew	21.3%	1,048
GPA After One Year		
> 3.00	30.7%	1,507
2.49 - 3.00	23.1%	1,134
2.00 - 2.50	21.9%	1,074
< 2.00	24.4%	1,200

Two criteria were used to assess the predictive validity of the revised CSI (CSI-A) in the present study: college GPA at the end of the first year of enrollment and enrollment status at the beginning of the second year. The various CSI-A scales were regressed on first-year college GPA, with a resulting multiple R of .61, which is an exceptionally high validity coefficient. This indicates that CSI-A was highly predictive of student success, when that success is defined in terms of first-year college GPA.

Three additional methods were used to estimate the predictive validity of the CSI. Several discriminant analyses were computed using enrollment status as the dependent variable. Secondly, analyses of covariance were conducted, using high school GPA as the covariate and enrollment status and first-year college GPA as the independent variables. Finally, regression equations were computed using enrollment status and first-year GPA as separate criterion variables.

Several discriminant analyses were computed using enrollment status as the dependent variable. When computed using all the CSI scale scores as the predictor, 71.96 percent of the cases were correctly classified, but the use of all the scales tended to overpredict re-enrollment. Therefore, a second discriminant analysis was computed using only Dropout-Proneness scores as the predictor. Since predicting enrollment status is only one intent of the CSI (and not its primary intent), it would seem appropriate that Dropout-Proneness scores should predict enrollment status more accurately than all the scales combined. In this analysis, 58.84 percent of the students were correctly classified as to their enrollment status. Although this was a substantial decrease in prediction using dropout proneness scores, it was accompanied by a substantial decrease in the false negative rate. This lower false

negative rate means that students who actually do drop out after one year are less likely to be predicted by the CSI to persist when using only the Dropout-Proneness scores instead of all the scale scores. Because the CSI has a two-fold intention (to assess risk level and to assess a broad spectrum of students' needs), it is to be expected that the Dropout-Proneness score would be a more useful predictor of enrollment status than all the other CSI scale scores. A comparison of the Dropout-Proneness scale score to high school GPA as a predictor also indicated that using high school GPA alone, 51.96 percent of the students could be accurately classified as to their enrollment status, with a comparable false negative rate of about 45 percent. This seems to indicate that using the Dropout-Proneness scores of the CSI enables colleges to do a somewhat better job of predicting enrollment status after one year than when using high school GPA alone.

Discriminant analyses using first-year college GPA as the dependent variable were also computed; these indicate that 71.2 percent of the students could be correctly classified as to their GPA after one year. The discriminant function was significant ($p < .001$) and included five scales: Dropout-Proneness, Family Emotional Support, Desire to Finish College, Study Habits, and Receptivity to Academic Assistance. These five scales accounted for 94.04 percent of the variance and were reduced to one function in the analysis. This means that these five scales can essentially be reduced to one scale which can correctly classify about 71 percent of students by college GPA. A similar analysis using high school GPA as the predictor found that 54 percent of the students could be correctly classified by college GPA. Therefore, it seems apparent that, when compared to the predictive validity of high-school GPA alone, the CSI allows schools to predict academic success with a much higher level of efficiency than they had previously been able to attain.

The second method used to examine the predictive validity of the CSI was to ascertain its effectiveness after taking into account students' high school GPAs. Accordingly, analyses of covariance were conducted, using high school GPA as the covariate and enrollment status and first-year college GPA as the independent variables. Using only enrollment status as the independent variable and high school GPA as the covariate, nine of the CSI scales contributed significantly to the differences between persisters and leavers, as mentioned earlier in Table 7. It should be noted that the scales which specifically measure affective factors are primarily the ones which significantly contribute to the differences between these two groups: Desire to Finish College, Family Emotional Support, Sense of Financial Security, Initial Impression, Receptivity to Career Counseling, Receptivity to Social Enrichment, Study Habits, Desire to Transfer and Dropout Proneness. These nine scales provide a picture of the mind set or characteristics a student possesses upon entering college which appear to predispose him or her to difficulties succeeding and persisting.

A second analysis of covariance was computed on the CSI scale scores of students grouped by first-year college GPA and enrollment status. Using high school GPA as the covariate, this analysis indicated that 17 of the 19 CSI scales contributed significantly to the differences between persisters and leavers grouped by first-year college GPA (see Table 9). The two scale scores which did not reach significance were Career Planning and Ease of Transition. Apparently, virtually all students have some difficulty making the transition to college; high school GPA was not a significant contributor to group differences, either. Career planning scores were affected by high school GPA, indicating that perhaps career maturity is strongly related to a student's academic achievement.

Table 9. Summary of Analyses of Covariance Comparisons of CSI Scale Scores of Students Grouped by Enrollment Status and First-year College GPA

Source	SS	Df	MS	F
Academic Confidence				
Covariate	27146.37	1	27146.37	276.88***
Main Effect	3325.57	7	475.08	4.85***
Explained	44233.10	8	5529.14	56.40***
Residual	464433.17	4737	98.04	
Total	508666.27	4745	107.20	
Attitude Toward Educators				
Covariate	8333.50	1	8333.50	96.80***
Main Effect	3934.13	7	562.02	6.53***
Explained	19095.37	8	2386.92	27.73***
Residual	408083.34	4740	86.09	
Total	427178.71	4748	89.97	
Desire to Finish College				
Covariate	2002.39	1	2002.39	20.54***
Main Effect	8434.76	7	1204.97	12.36***
Explained	14318.14	8	1789.77	18.35***
Residual	471174.50	4832	97.51	
Total	485492.64	4840	100.31	
Desire to Transfer				
Covariate	479.13	1	479.13	28.32***
Main Effect	3040.50	7	434.36	25.67
Explained	3894.15	8	486.77	28.77***
Residual	77557.82	4584	16.92	
Total	81451.96	4592	17.74	
Dropout Proneness Summary Scale				
Covariate	1349.22	1	1349.22	533.03***
Main Effect	256.81	7	36.39	14.49***
Explained	2485.76	8	310.72	122.76***
Residual	12316.83	4866	2.53	
Total	14802.59	4874	3.04	
Family Emotional Support				
Covariate	5476.38	1	5476.38	40.47***

	Main Effect	4001.99	7	571.71	4.23***
	Explained	12647.49	8	1580.94	11.68***
	Residual	651857.14	4817	135.32	
	Total	664504.63	4825	137.72	
Financial Security					
	Covariate	290.16	1	290.16	6.40*
	Main Effect	1912.58	7	273.23	6.03***
	Explained	2299.34	8	287.42	6.34***
	Residual	210876.79	4650	45.35	
	Total	213176.13	4658	45.77	
Initial Impression					
	Covariate	5576.15	1	5576.15	35.36***
	Main Effect	13383.29	7	1911.90	12.12***
	Explained	23496.55	8	2937.07	18.62***
	Residual	767415.16	4874	157.71	
	Total	790911.71	4874	162.27	
Intellectual Interests					
	Covariate	3841.01	1	3841.01	46.84***
	Main Effect	4424.39	7	632.06	7.71***
	Explained	13689.20	8	1711.15	20.87***
	Residual	383176.65	4673	82.00	
	Total	396865.85	4681	84.78	
Leadership					
	Covariate	3015.56	1	3015.56	47.05***
	Main Effect	1064.44	7	152.06	2.37*
	Explained	6329.56	8	791.20	12.35***
	Residual	301741.68	4708	64.09	
	Total	308071.24	4716	65.33	
Openness					
	Covariate	3429.45	1	3429.45	33.21***
	Main Effect	7937.60	7	1133.94	10.98***
	Explained	18989.55	8	2373.69	22.99***
	Residual	499878.15	4841	103.26	
	Total	518867.70	4849	107.01	
Predicted Academic Difficulty					

Covariate	8411.80	1	8411.80	640.13***
Main Effect	2392.98	7	341.85	26.02***
Explained	17573.66	8	2196.71	167.17***
Residual	63943.03	4866	13.14	
Total	81516.69	4874	16.73	
Receptivity to Academic Assistance				
Covariate	9294.42	1	9294.42	149.29***
Main Effect	2662.24	7	380.32	6.11***
Explained	17436.87	8	2179.61	35.01***
Residual	302944.78	4866	62.26	
Total	320381.64	4874	65.73	
Receptivity to Career Counseling				
Covariate	105.79	1	105.79	2.04
Main Effect	1213.69	7	173.38	3.34***
Explained	1215.74	8	151.97	2.93***
Residual	252677.20	4866	51.93	
Total	253892.94	4874	52.09	
Receptivity to Personal Counseling				
Covariate	1157.44	1	1157.44	28.26***
Main Effect	652.72	7	93.25	2.28*
Explained	2989.72	8	373.72	9.12***
Residual	199333.63	4866	40.97	
Total	202323.35	4874	41.51	
Receptivity to Social Enrichment				
Covariate	514.35	1	514.35	18.79***
Main Effect	1137.91	7	162.56	5.94***
Explained	1634.25	8	204.28	7.46***
Residual	133237.85	4866	27.38	
Total	134872.11	4874	2767	

Self-Reliance					
	Covariate	862.00	1	862.00	10.96***
	Main Effect	1447.63	7	206.81	2.63**
	Explained	2504.03	8	313.00	3.98***
	Residual	375366.47	4773	78.64	
	Total	377870.50	4781	79.04	
Sociability					
	Covariate	9.92	1	9.92	.15
	Main Effect	2187.67	7	312.52	4.82***
	Explained	2585.26	8	323.16	4.98***
	Residual	311232.13	4800	6484	
	Total	313817.38	4808	65.217	
Study Habits					
	Covariate	40538.49	1	40538.49	257.81***
	Main Effect	16866.56	7	2409.51	15.32***
	Explained	96801.25	8	12100.16	76.95***
	Residual	750503.57	4773	157.24	
	Total	847304.83	4781	177.22	

p < .05
 ** p < .01
 *** p < .001

Integrating the above results, it is possible to develop a profile of the typical at-risk student using all but two of the CSI scale scores. Particularly when one defines risk not only in terms of enrollment status after one year, but also in terms of first-year college GPA, the profile becomes clearer. Thus a student “at risk” might be described as possessing the following:

- A poor academic preparation for college
- A negative initial impression of the institution
- An unrealistically high level of academic confidence
- Poor study habits
- Little sense of the value of a college education
- Negative prior experiences with educators
- Little support from family
- A low level of openness
- Significant doubts about their ability to finance their college education

- A higher level of sociability coupled with low self-reliance which makes them susceptible to peer pressure
- Lower levels of perceived acceptance as a leader
- Higher levels of receptivity to academic assistance and personal counseling
- Lower levels of receptivity to career counseling and opportunities to become engaged in the social life of the campus

The third method used to examine predictive validity was the use of multiple regression analyses. A logistic regression equation was computed using enrollment status after one year as the criterion and all the CSI scale scores as the predictors. This analysis indicated that the use of all the scale scores could not significantly predict enrollment status. Thus, a forward stepwise regression equation was computed using first-year college GPA as the criterion and found that an equation including 14 of the CSI scales could account for 23 percent of the variance in first-year GPA (multiple $r = .48$), a figure which compares favorably to that found in other research conducted on student persistence (Ethington, 1990; Fox, 1986; Pascarella, Duby, & Iverson, 1983; Stoecker, Pascarella, & Wolfle, 1988). Those scales and their beta weights are presented in Table 10.

Table 10. Results of the Forward Stepwise Regression Analysis of CSI-A Scales with First-Year College GPA as the Dependent Variable

CSI-A Scale	Beta Weight
Dropout Proneness	-2.69
Desire to Finish College	-1.06
Family Emotional Support	-1.03
Study Habits	-.97
Receptivity to Academic Assistance	.66
Sociability	-.13
Openness	.12
Self-Reliance	-.09
Leadership	.07
Desire to Transfer	-.05
Attitude Toward Educators	-.05
Receptivity to Career Counseling	.05
Receptivity to Social Enrichment	-.05
Initial Impression	-.04

A final indication of predictive validity involved correlating the various CSI scale scores with first-year college GPA. This process found the following scales significantly correlated to college GPA:

- Receptivity to Academic Assistance
- Academic Confidence
- Career Planning
- Desire to Finish College
- Attitude Toward Educators
- Family Emotional Support
- Initial Impression
- Intellectual Interests
- Leadership
- Openness
- Receptivity to Personal Counseling
- Sociability
- Study Habits

- Desire to Transfer
- Receptivity to Career Counseling
- Dropout-Proneness
- Perceived Academic Difficulty
- Educational Stress
- Receptivity to Institutional Help ($p < .001$)

In integrating the findings from the present study, we can conclude that the CSI effectively predicts academic success in terms of first-year college GPA and enrollment status, even after controlling for high school GPA. This conclusion is supported by the high correlation between the CSI and college GPA, in the ability of the CSI to correctly classify 71 percent of the students by GPA, in the multiple regression equation accounting for 23 percent of the variance in college GPA, and in the analyses of covariance indicating that all but two of the CSI scales significantly contribute to differences between groups after taking into account high school GPA. We can also conclude that certain scales of the CSI are effective predictors of enrollment status after one year, although these predictions are quite naturally not as accurate. Although the CSI as a whole does not predict enrollment status as well as it does first-year college GPA, it is still a more efficient predictor of enrollment status than is high school GPA alone.

Institution-Specific Predictive Validity (CSI – Form A)

An institution-specific study of the predictive validity of the CSI was conducted by Schreiner (1989) at two private liberal arts colleges. A total of 379 first-year students were administered the CSI, and their enrollment status was ascertained the following year. An analysis of variance conducted on the Dropout Proneness scores indicated that there was a significant difference in the scale scores of persisters and leavers ($p < .001$). A discriminant analysis was also computed using enrollment status after one year as the dependent variable. The results indicated that 64.37 percent of the students could be correctly classified, with a false negative rate of 35 percent.

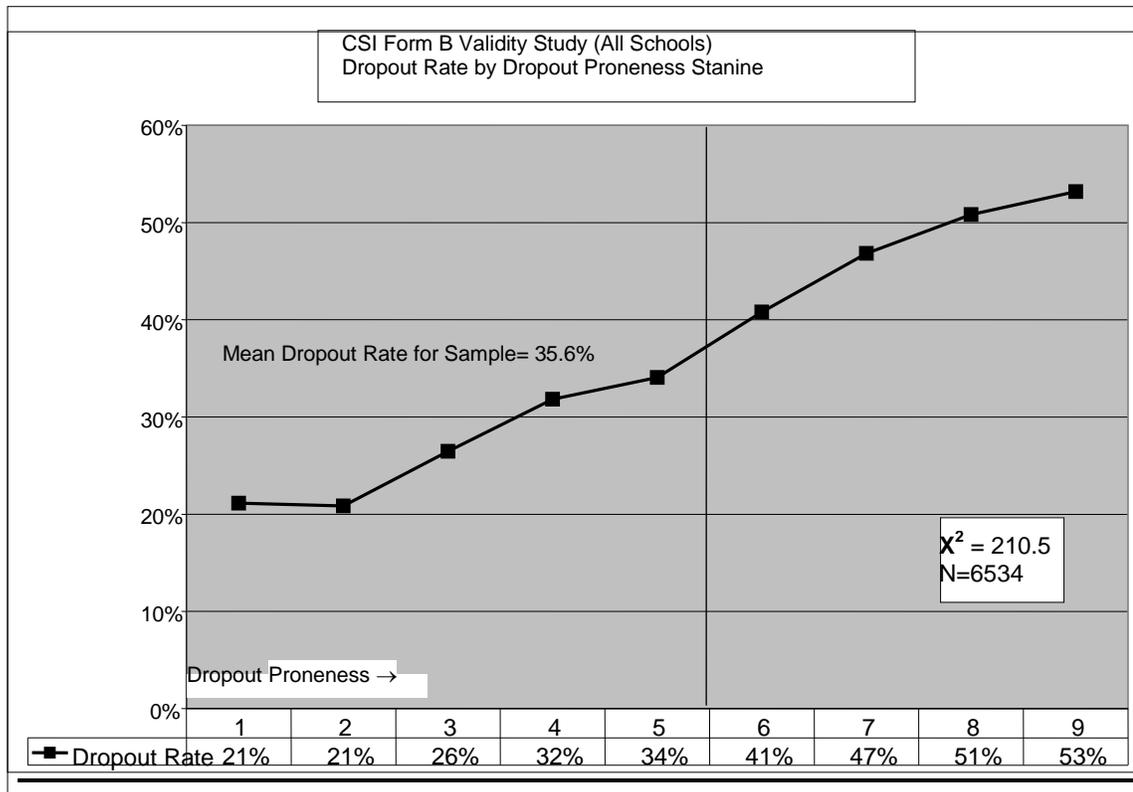
As Pascarella (1986) notes, “The substantial body of empirical evidence generated by the Tinto model has supported the notion of person-environment fit” (p. 100). The ability to identify at-risk students has been shown to vary significantly from institution to institution in previous studies (Pascarella, 1986) and indeed this can be seen in the higher predictive validity of the instrument found at two specific colleges, as compared to the national sample (Schreiner, 1989). Specific institutions are encouraged to develop local prediction equations over a period of several years using CSI variables. These equations are likely to enhance the prediction of student outcomes than because they will capture the specific configuration of motivation forces operating at that institution. Thus, they will take into account such factors as student body characteristics, faculty characteristics, institutional history, characteristics of the extracurricular activities available on campus (e.g., the presence or absence of salient athletic programs), and community characteristics. All of these dimensions can influence how students respond to their college environment, both academically and socially.

These studies seem to indicate that we can identify at-risk students with a fairly high degree of accuracy with the CSI. Particularly when we define “at-risk” in the sense of academic risk, the CSI enables institutions to improve their predictive efficiency considerably. Using the CSI is certainly more predictive than mere intuition, and it is also better than the traditional means used, such as high school GPA.

The 2001 Validity Study (CSI – Form B)

The purpose of the 2001 validity study was to determine the relationship between the CSI predictions and a criterion data set. Accordingly, the enrollment status and GPA of 7,215 students who completed the CSI-B the previous year were examined using Chi-square and correlation analysis.

Figure 1: Attrition Rates by Dropout Proneness Stanine

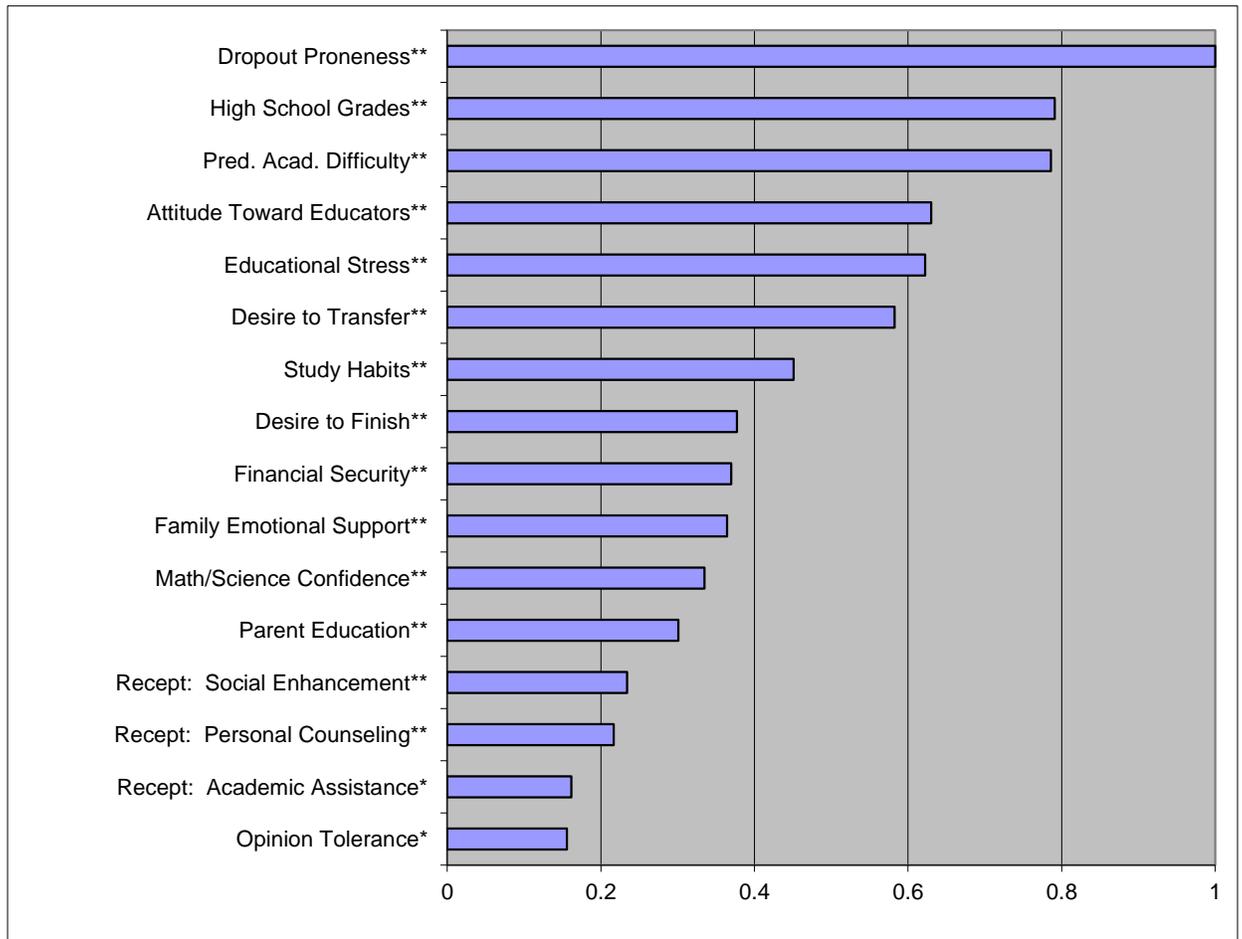


Consistent with national norms, 35.6 percent of the sample population dropped out of their original institution by the beginning of the second year. As can be seen in figure 1, there is a significant positive relationship between the Dropout Proneness prediction, and the observed dropout rate after one year. The results show a Chi-square value of 210.5, which is statistically significant ($p < .001$). More specifically, there is less than one chance in a thousand that the observed relationship between CSI-B's Dropout Proneness stanine and actual persistence is random. As expected, the dropout rate becomes higher than average once the stanine exceeds a value of five.

To strengthen the measured validity of the Dropout Proneness scale, a second analysis was conducted, comparing each of the published CSI-B scales with persistence. In this analysis, the correlation of each scale was indexed against the Dropout Proneness scale (Dropout Proneness = 100). The results show the Dropout Proneness scale to be the single most predictive scale available in the inventory. Dropout Proneness shows higher predictive validity than either High School GPA or Desire to Transfer¹. The results of this exercise are shown in figure 2.

¹ Note: Dropout Proneness, Predicted Academic Difficulty, and Educational Stress are all compound scales, which are calculated by weighing the various individual scales. Note, that CSI-B's Dropout Proneness scale exceeds Senior Year GPA – which is demonstrated to have higher predictive validity than standardized test scores (Camara and Echternacht).

Figure 2: Significant Multiple R Correlations of CSI-B Scales with Persistence (indexed)

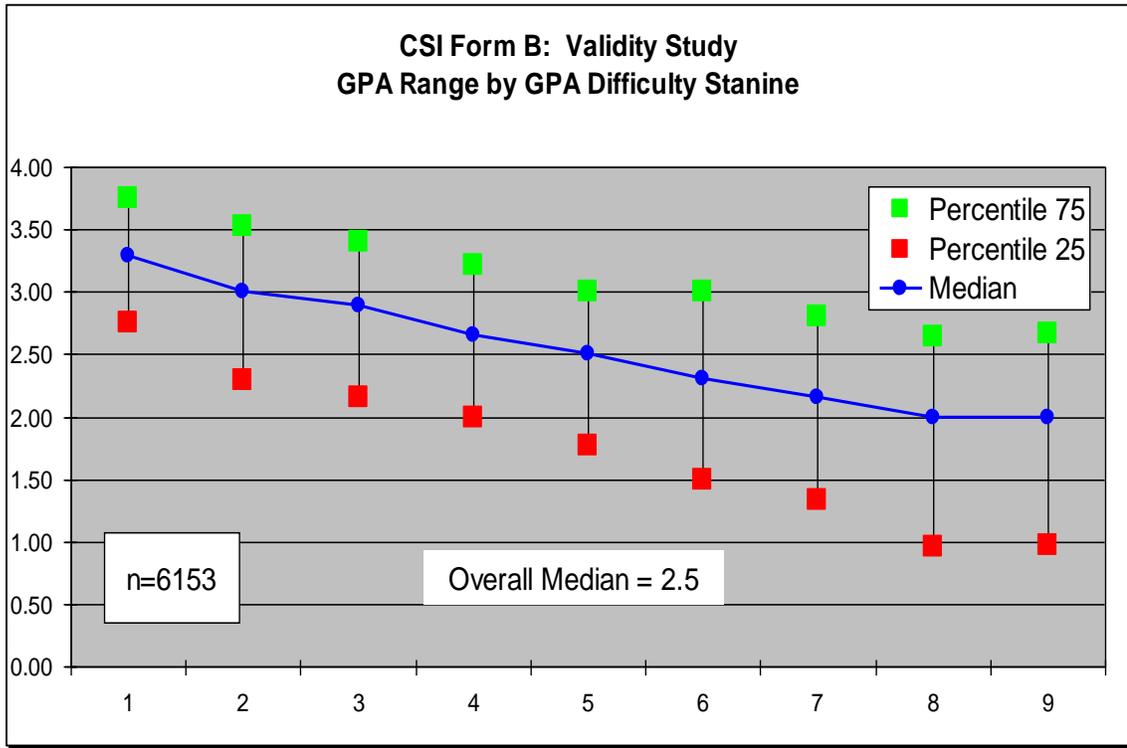


*Significant at $p < 0.05$; ** Significant at $p < 0.01$

As figure 2 shows, the compound Dropout Proneness scale demonstrated the highest level of predictive power, relative to all possible CSI-Scales, including Senior Year GPA. Still, most of the CSI motivational scales correlated significantly with persistence. This finding strongly illustrates the relationship between the motivational factors observed and persistence in postsecondary education.

A similar set of analytical routines were executed using the first-year cumulative GPA as a dependent variable.

Figure 3: Cumulative GPA by Predicted Academic Difficulty Stanine

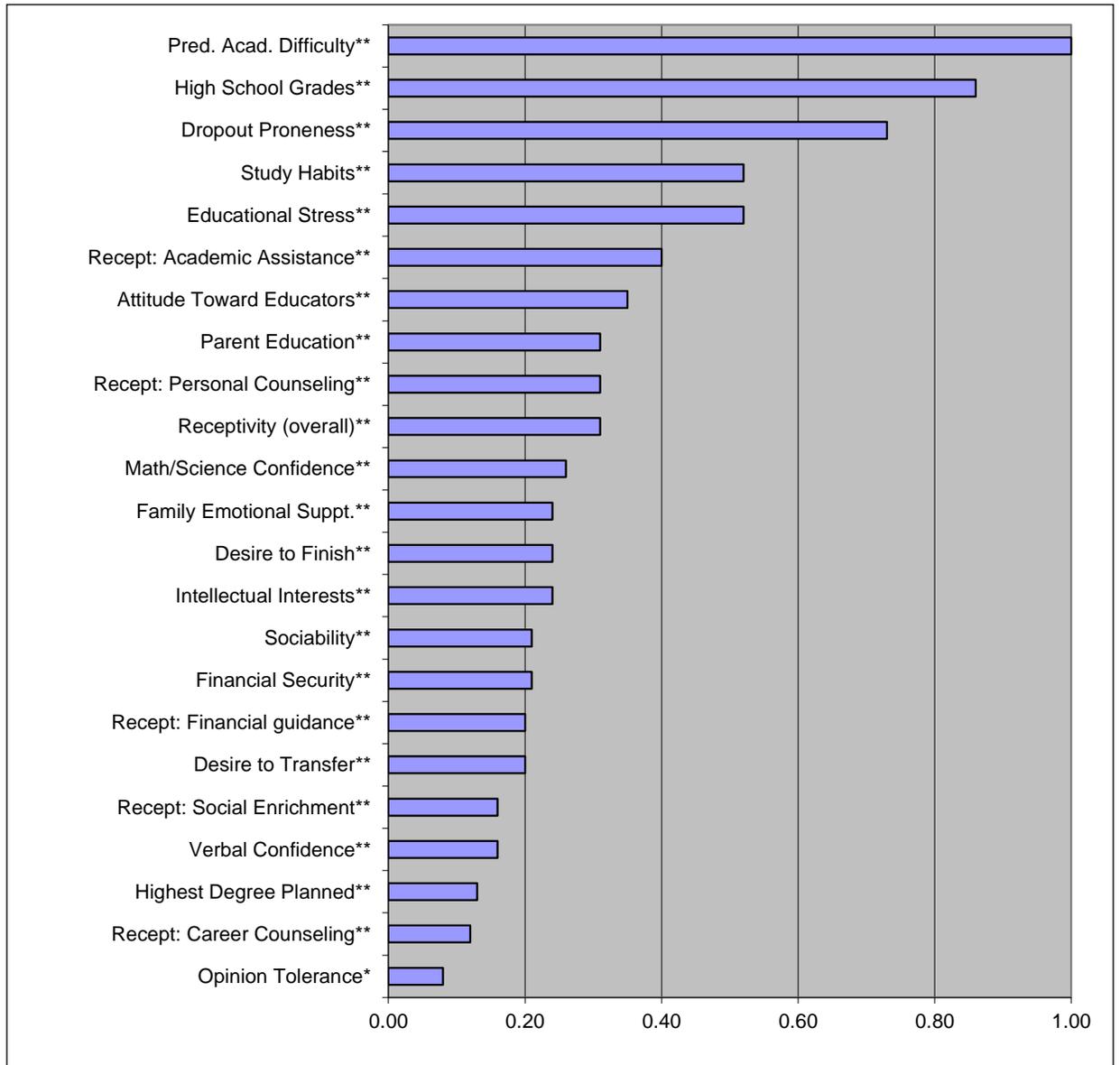


As figure 3 shows, the Predicted Academic Difficulty stanine showed a significant, negative correlation with cumulative first-year GPA. The correlation coefficient (multiple $R = 0.38$) is sufficiently significant to ensure that there is less than one chance in a thousand that the correlation between CSI-B's Dropout Proneness stanine and actual persistence is random. As expected, the median cumulative GPA falls below the overall population median as the Predicted Academic Difficulty stanine exceeds a value of five.

A second correlation analysis was conducted to examine the relationship between each of the scales in CSI-B and first-year cumulative GPA. The results of this procedure are shown in Figure 6, showing the indexed multiple R for each variable. As expected, the compound scale, Predicted Academic Difficulty, emerged as having the highest predictive validity in this analysis.

Predicted Academic Difficulty showed significantly higher predictive validity than High School Grades, thereby suggesting that the addition of motivational information adds significant value to grades as predictors of student success.

Figure 4: Significant Correlations: CSI-B Scales with Cumulative GPA (indexed)



* Significant at $p < 0.05$; ** Significant at $p < 0.01$

While 23 different variables showed a strong correlation with cumulative GPA, the compound scale, Predicted Academic Difficulty demonstrated the highest predictive validity in this analysis.

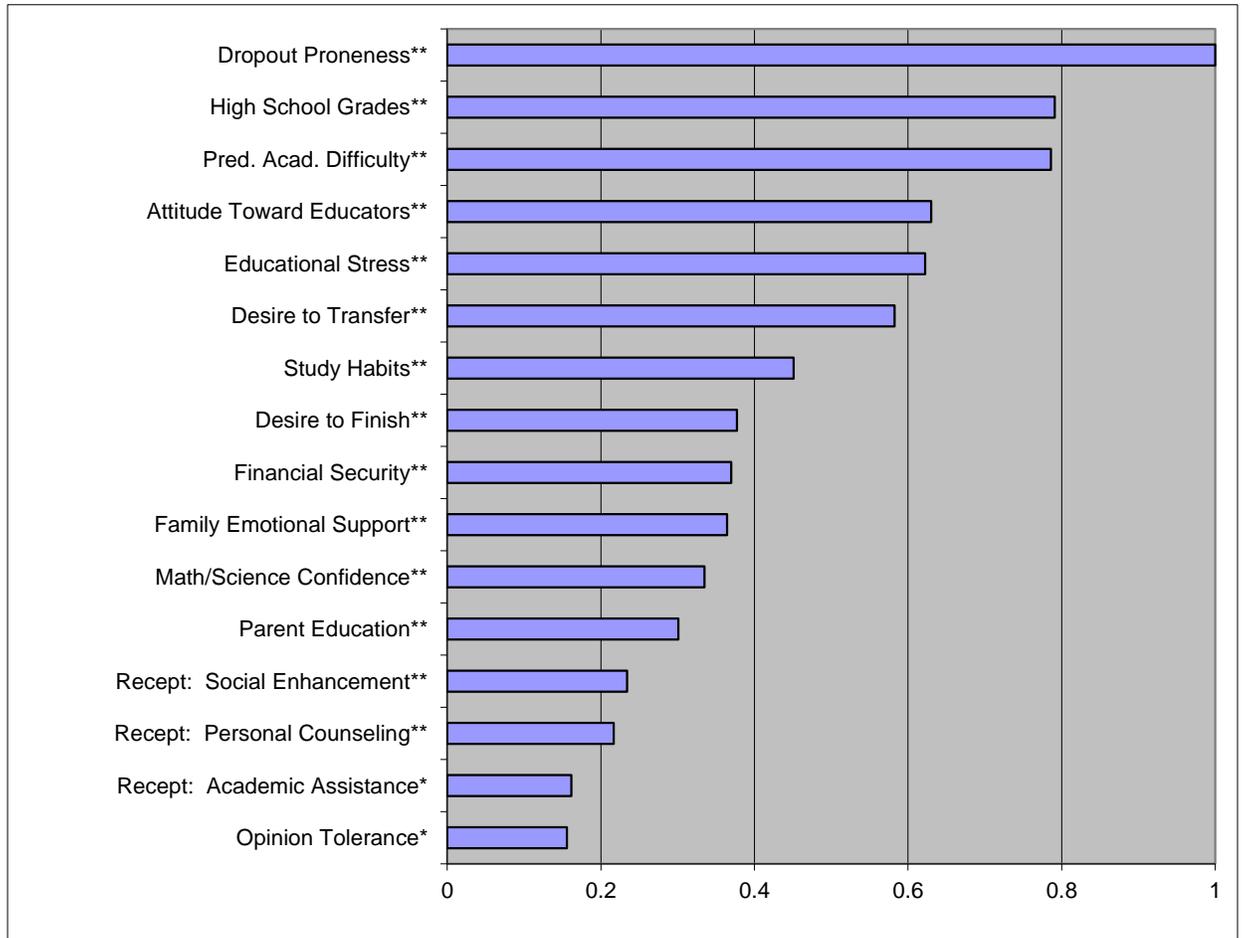
The high relative correlation between Predicted Academic Difficulty and its criterion variable (cumulative GPA) affirms the value of the motivational content included in this scale.

The statistical analysis of persistence and GPA affirm the validity of using CSI-B as a tool for assessing students' risk of dropping out, as well as their risk of earning low GPAs. Moreover, the data show that Dropout Proneness and Predicted Academic Difficulty stanine

scores have significant relationships with their respective criterion variables (persistence and cumulative GPA). The research also shows the scales to hold significantly higher predictive validity, relative to the entire set of data gathered in the CSI-B survey.

Collectively, these findings serve to justify the use of these two predictive scales, given their reliability, validity, and added value.

Figure 5: Significant Multiple R Correlations of CSI-B Scales with Persistence (indexed)



*Significant at $p < 0.05$; ** Significant at $p < 0.01$

As figure 5 shows, the compound Dropout Proneness scale demonstrated the highest level of predictive power, relative to all possible CSI-Scales, including Senior Year GPA. Still, most of the CSI motivational scales correlated significantly with persistence. This finding strongly illustrates the relationship between the motivational factors observed and persistence in postsecondary education.

A similar set of analytical routines were executed using the first-year cumulative GPA as a dependent variable.

2012 - Predicting Beyond the First Year (CSI – Form B)

Slanger (2012) demonstrated the power of the CSI – Form B from a faculty point of view by showing that the predictability of the CSI lasts through at least the tenth semester of attendance. He studied the student outcomes at one institution in exhaustive detail: grade point average (GPA), enrollment retention, and academic capacity. Academic capacity was defined by dividing grade points earned by the number of courses for which a grade was given. The conclusions, recommendations, and insights of this study facilitated collaborative discussions between professional student advisors and faculty student advisors. They also provided a context in which advisors could take a more sophisticated, holistic approach to interpreting the CSI scores that go beyond the face values of the scores.

The data for this study focused on five years of Form B results (paper administrated). Data collection details were fall 2002: summer orientation (N=1,064); fall 2003: those enrolled in the mandatory freshmen orientation one-credit course (N=1,366); followed by those enrolled in selected academic colleges fall 2004 through 2006 with Ns of 640, 497, and 163, respectively. The data were carefully edited, in part because of the need to calculate academic capacities accurately. Students could “step out of the institution” for one fall or spring semester, but data of any semesters after two successive such “step outs” were not included. For each year, a Mallow’s CP model section approach was used to select the best linear regression model for each of the ten cumulative semester grade point averages from the 20 CSI values, including the stanine and percentile values for Dropout Proneness, Predicted Academic Difficulty, Educational Stress, and Receptivity to Institutional Help. The same was done for cumulative academic capacity, but only through the eighth semester. The Jonckheere-Terpstra test was used to test for the power of each of the four stanine measures to predict number of semesters enrolled at the institution and, in the case of transfer-outs, elsewhere (using National Student Clearing House data).

With regard to the best linear regression modeling, the approach meant constructing five separate model results for cumulative GPA for semesters of attendance: first, second, third, fourth, and fifth. Slanger then counted the number of times each of the 20 CSI values were included in these five models and then averaged their respective probability of significance values. There were four years of data for semesters six and seven, three years for semesters eight and nine, and two years for semester 10. The approach for cumulative academic ability was exactly the same, except the maximum number of years was four because the study only went through the eighth semester. The resulting two tables, one for GPA and one for academic capacity, allowed studied synthesis to the conclusions and recommendations. With regard to Enrollment Retention, “chi-square” type tables were created for all the possible combinations of fall of matriculation (five of them) and the four stanine values of Dropout Proneness, Predicted Academic Difficulty, Educational Stress, and Receptivity to Institutional Help. The numbers inside these tables were, separately: total semesters at any institution, semesters enrolled at the institution, semesters enrolled at the institution or another four-year institution, semesters enrolled at another four-year institution, and semesters enrolled at a two-year institution. However, instead of a chi-square statistical test, the Jonckheere-Terpstra test was used.

In this extensive study of five years of CSI–B data, Slanger showed that:

- The CSI was equally predictive of cumulative grade point average and academic capacity for each semester, and equally predictive within each of the five years.

- The number of CSI variables picked by the statistical model selection method was approximately eight out of the possible 20 CSI variables, and there was an encouraging similarity in these approximate eight for all semesters and from year-to-year.
- The R-squares of the selected regression models were also similar across all year-by semester combinations.
- These three conclusions can be drawn equally from both stanine and percentile results.
- The Dropout Proneness score was very predictive (using the Jonckheere-Terpstra test) of retention for semesters one through five and the combination of semesters six through eight.

The CSI was as predictive of cumulative academic capacity as it was of grade point average and can distinguish between these two variables. This last conclusion comes as a result of noticing that, while the CSI variables selected for the predictive models were pretty much the same for cumulative grade point average and academic capacity, there was a noticeable difference in their frequency of selection across the semesters.

The long-haul life skills (i.e., Study Habits, Verbal and Writing Confidence, and Opinion Tolerance) start to become more predictive of GPA at the long-haul fifth and sixth semesters. Study of the patterns of frequencies of model inclusions and respective average statistical significant values led to the strong impression that the CSI can separate affective characteristics from academic characteristics.

The conclusions of the above two paragraphs deserve elaboration. Slanger found that the CSI can statistically distinguish between GPA and academic capacity. While the two variables are obviously correlated, they are not the same variable. Predicted Academic Difficulty was strongly predictive of both variables across all semesters. Dropout Proneness and Receptivity to Academic Assistance were also predictive of GPA, but quite noticeably less so for academic capacity. Fundamental personal characteristics developed over the many formative years before college (e.g., the ones listed in the above paragraph plus Intellectual Interests, Confidence, and Attitude Toward Educators) become more and more predictive of capacity than of GPA as the semesters progress. Also, the signs of the selected regression model coefficients (+ or -) are not always as one might assume. For instance, higher confidence was negatively associated with GPA after adjusting for the other variables selected into the predicted regression models.

As with GPA and academic capacity, Slanger (2012) concluded from this study that the CSI was an exceptional instrument for predicting retention. More specifically:

- Educational Stress was predictive of long-term retention in higher education (i.e., total semesters and semesters at four-year institutions).
- Predicted Academic Difficulty is predictive of all five measures of semesters enrolled, but there is no need to look further than Dropout Proneness.

Except for semesters at other four-year institutions and semesters at two-year institutions, the Dropout Proneness stanine was predictive at $P < 0.001$ for each of the five years for total semesters, North Dakota State University semesters, and semesters at other four-year institutions.

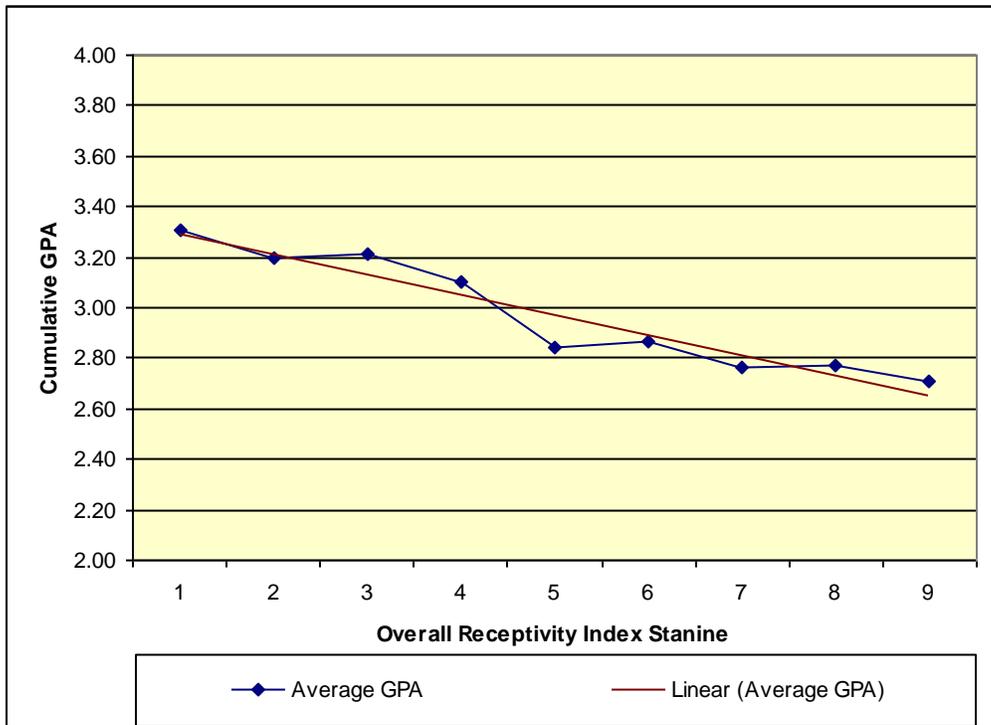
In fact, matriculating students with low dropout probability stanine scores of one, two, three, or four, were three times more likely to be enrolled at the institution the very next spring semester than their classmates with high dropout probability stanine scores of six, seven, eight, or nine. This same three-to-one advantage was still true for enrollments in the sixth, seventh, or eighth semester with the institution.

Summary Scales and Average GPA (CSI – Form C)

Three of the four summary scales in Form C were tested against student success and risk indicators: the overall receptivity index, the acknowledged academic needs index, and the apprehension index. Students' academic success was measured by the average cumulative GPA, while risk was measured by a composite risk score that incorporated academic success and persistence.

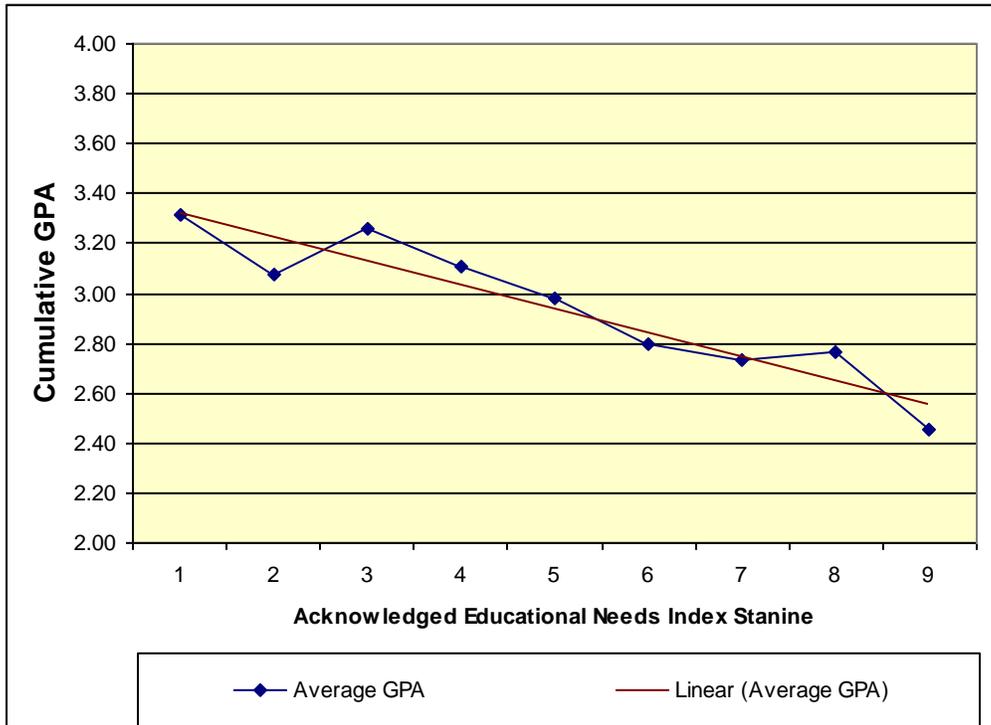
All three summary scales had a negative correlation with cumulative GPA, indicating that as students receive a higher stanine score on each of these scales, the average GPA declines. The following three graphs show the relationship between these three scales and cumulative GPA.

Figure 6: Average Cumulative GPA by Overall Receptivity Index



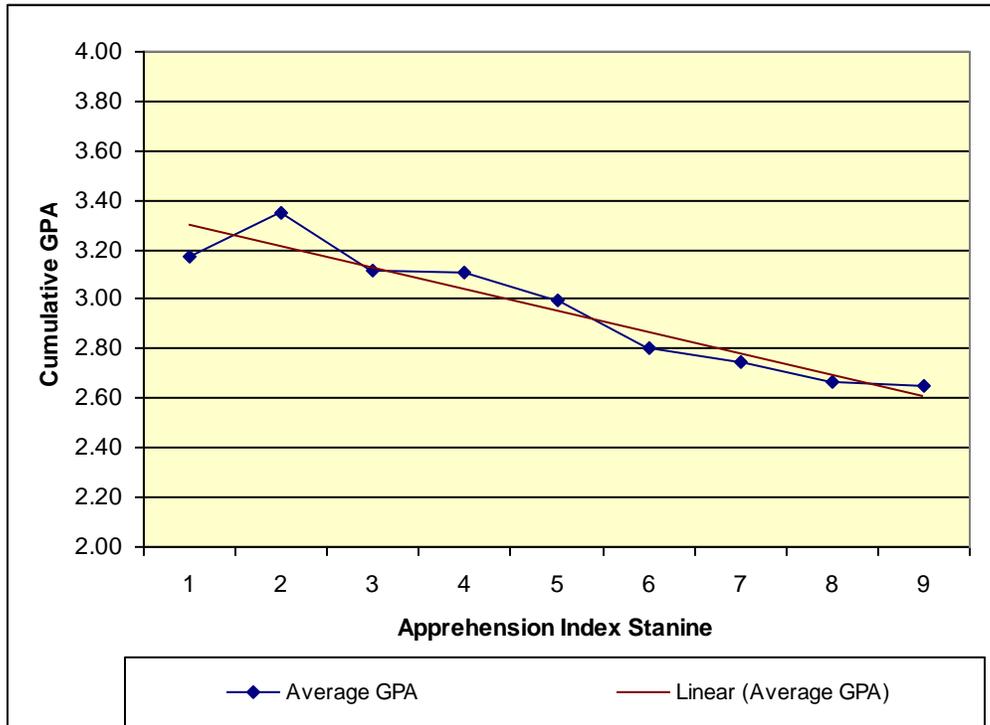
The overall receptivity index measures the student's openness and need to receive information and assistance in three general areas: Receptivity to Academic Assistance, Receptivity to Financial Guidance, and Receptivity Career Planning. Figure 1 indicates that high scores on the overall receptivity index are correlated with weaker average GPAs. The blue line of average GPAs and the accompanying red trend line show that students are aware of their challenges and indicate this in a higher Receptivity to Institutional Assistance.

Figure 7: Average Cumulative GPA by Acknowledged Academic Needs Index



Similarly, the acknowledged academic needs index shows a negative correlation to cumulative GPA. Students who are academically less prepared correctly assess their situations and indicate their needs in many areas of academic competency.

Figure 8: Average Cumulative GPA by Apprehension Index



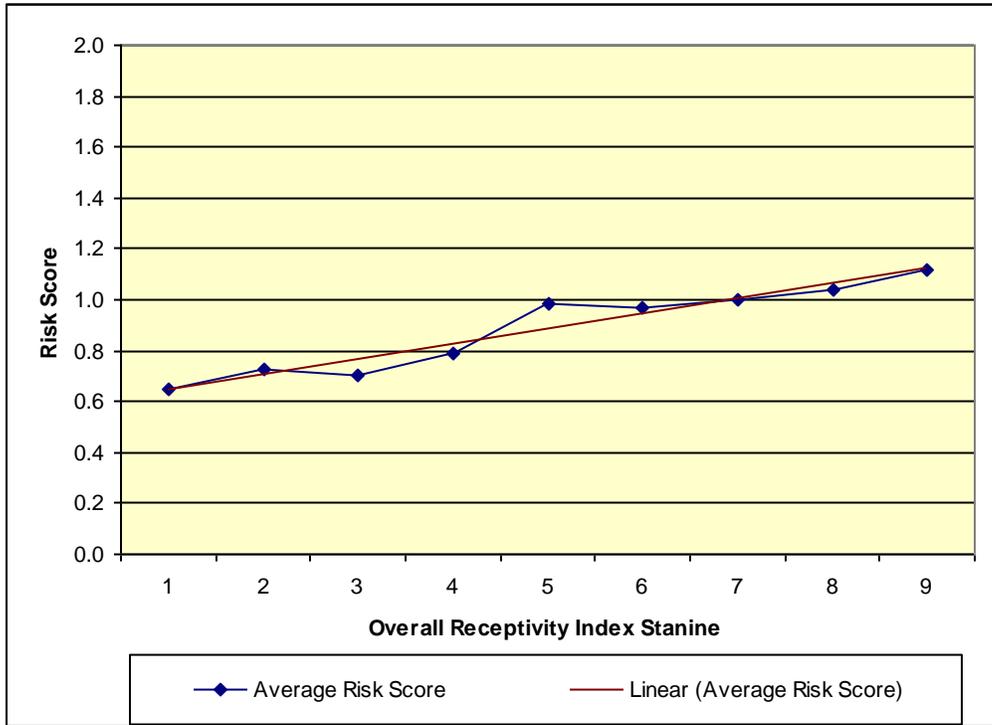
The Apprehension Index captures those items across the many scales that indicate uncertainty or fear about being able to cope and perform well in school. Again, students who are academically weaker show higher levels of apprehension than students with higher average GPAs.

Summary Scales and Academic Risk (CSI – Form C)

In addition to cumulative GPA, these three summary scales (the Overall Receptivity Index, the Acknowledged Academic Needs scale, and the Apprehension scale) in Form C were tested against a risk indicator that was based on academic performance and progress and persistence. A higher risk score indicates that the student has several risk factors, including a low GPA, poor academic progress, and non-persistence.

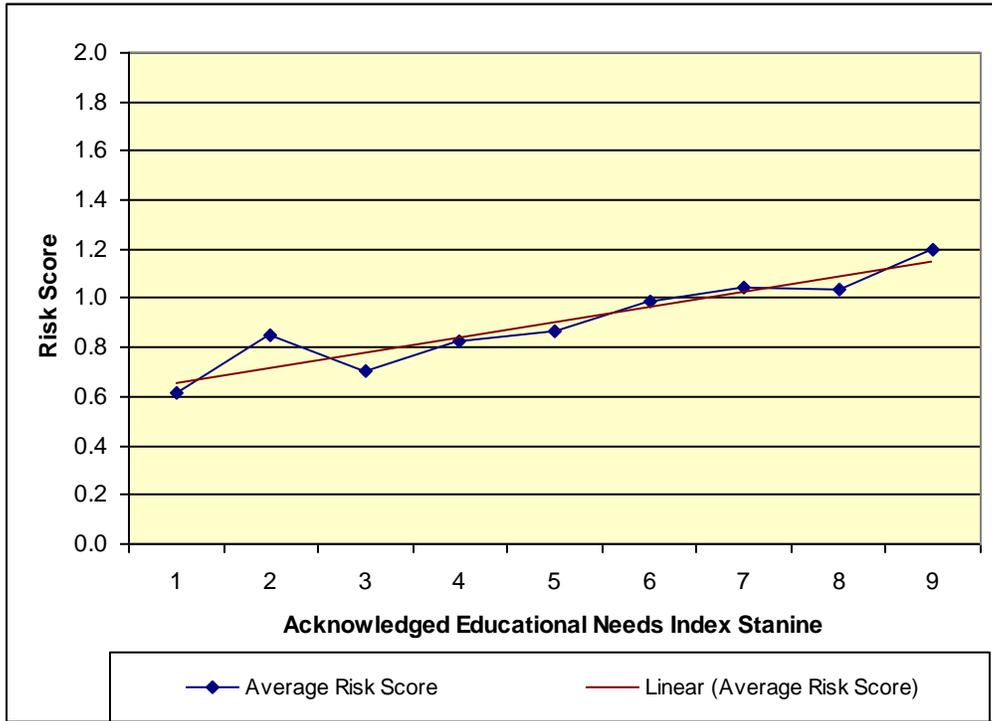
The correlation between risk and the overall receptivity index is positive, indicating that students with higher overall receptivity are at a higher academic risk. *This underscores the link between an accurate self-assessment and asking for assistance and academic risk factors.*

Figure 9: Average Risk Score by Overall Receptivity Index



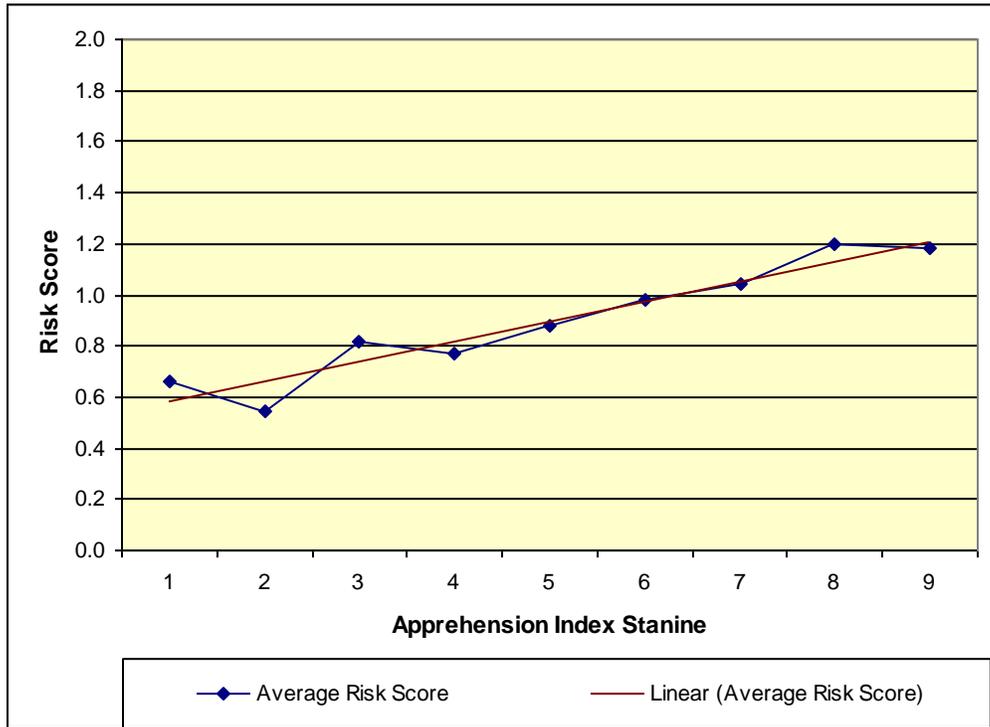
Similarly, Acknowledged Academic Needs are linked to increased academic risk. Those students who acknowledge a great need for academic assistance are at a higher risk.

Figure 10: Average Risk Score by Acknowledged Academic Needs Index



Finally, increased academic Apprehension is also correlated to increased academic risk. Students who report a high level of apprehension are at twice the academic risk of those who report a low level of apprehension.

Figure 11: Average Risk Score by Apprehension Index



The Overall Risk Index (CSI – Form C)

The Overall Risk Index assesses a student’s academic risk based on both scale and demographic information. This index is the result of a regression analysis that included all available student data and kept only the most predictive elements, using the calculated academic risk score as the dependent variable. This scale is designed specifically to measure academic risk.

Figure 12: Average Cumulative GPA by Overall Risk Index

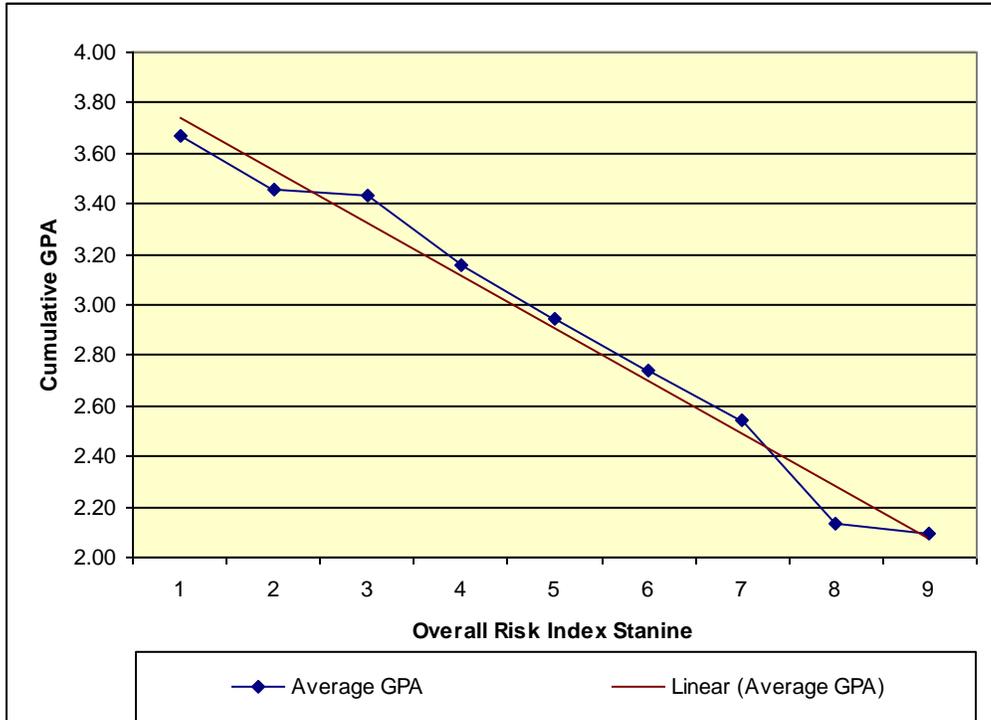
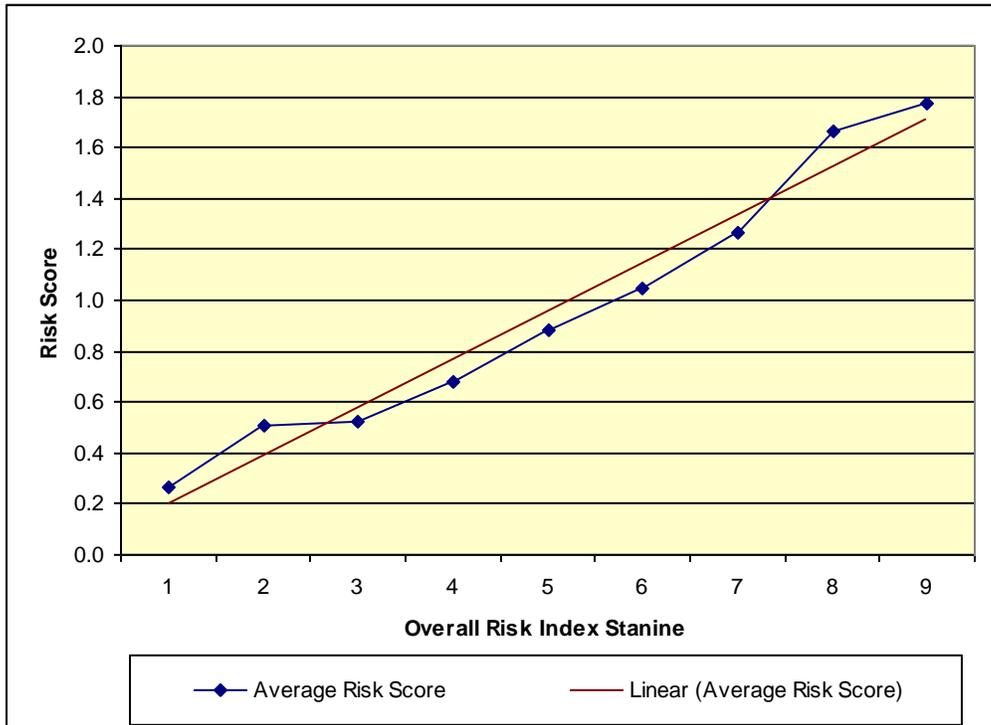


Figure 13: Average Risk Score by Overall Risk Index



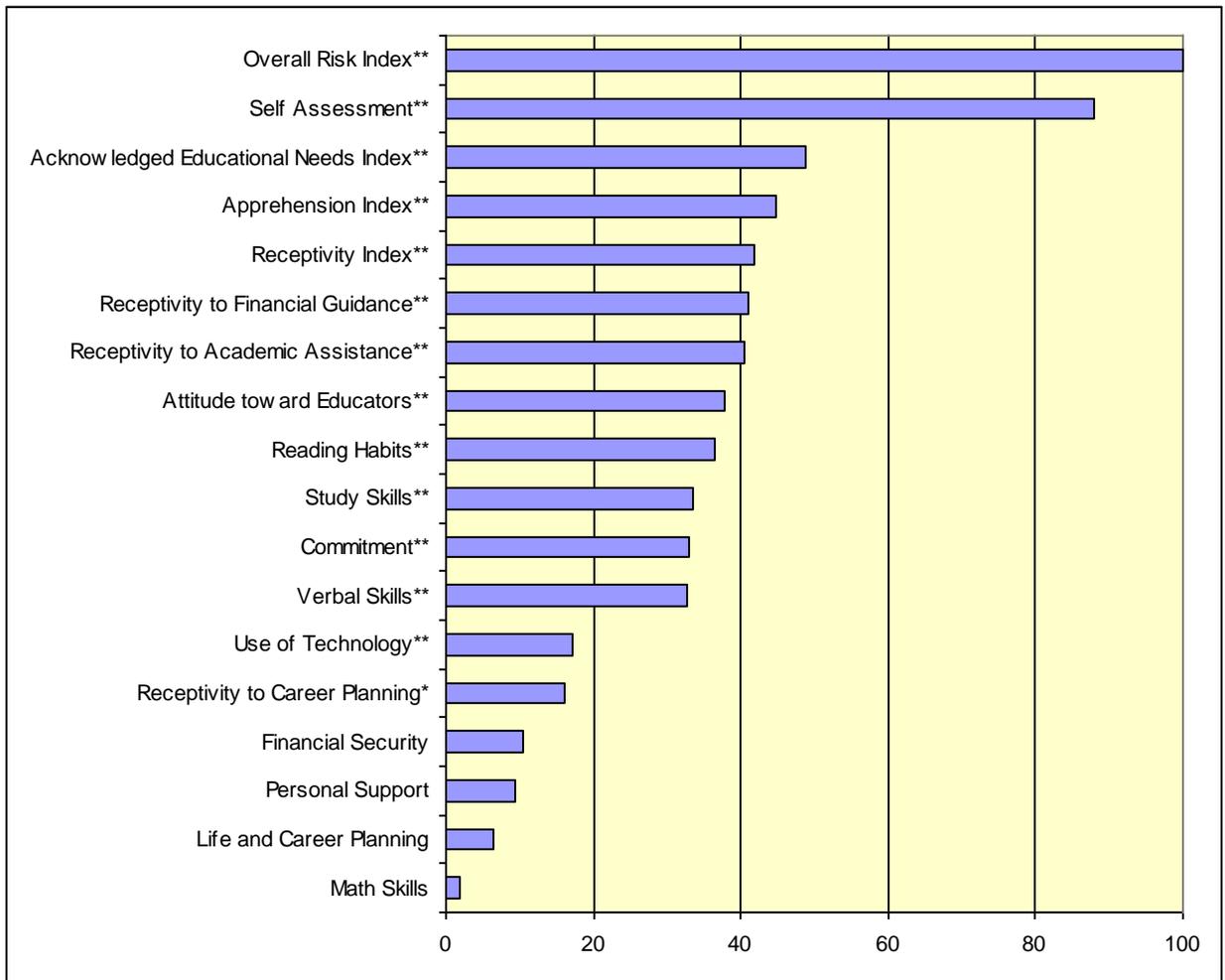
The overall risk index is highly correlated with GPA and shows a strong declining average GPA by risk stanine. The risk index correctly identifies students with a low GPA. The overall risk index also strongly reflects student risk as determined by the calculated risk score for students at the end of the first term.

Relative Predictive Validity of All Scales (CSI – Form C)

The CSI-C scales and prior academic performance were tested for their relative predictive strength against cumulative GPA and the risk score. These predictive indicators are based on a correlation with each variable that is indexed to its strongest predictor.

Of the 17 scales (13 individual scales and four summary scales) and prior academic performance, most show a strong relation to cumulative GPA. The Overall Risk scale has the strongest relation to cumulative GPA (with a correlation coefficient strength of 0.377), which outperforms prior academic performance (self-assessment). All summary scales have a strong relation to cumulative GPA, followed by the Receptivity scales, Attitude toward Educators, Reading and Study Skills scales, and Commitment to education.

Figure 14: Relative Correlation of CSI-C Scales to Cumulative GPA



* Correlation is significant at $p < 0.05$.

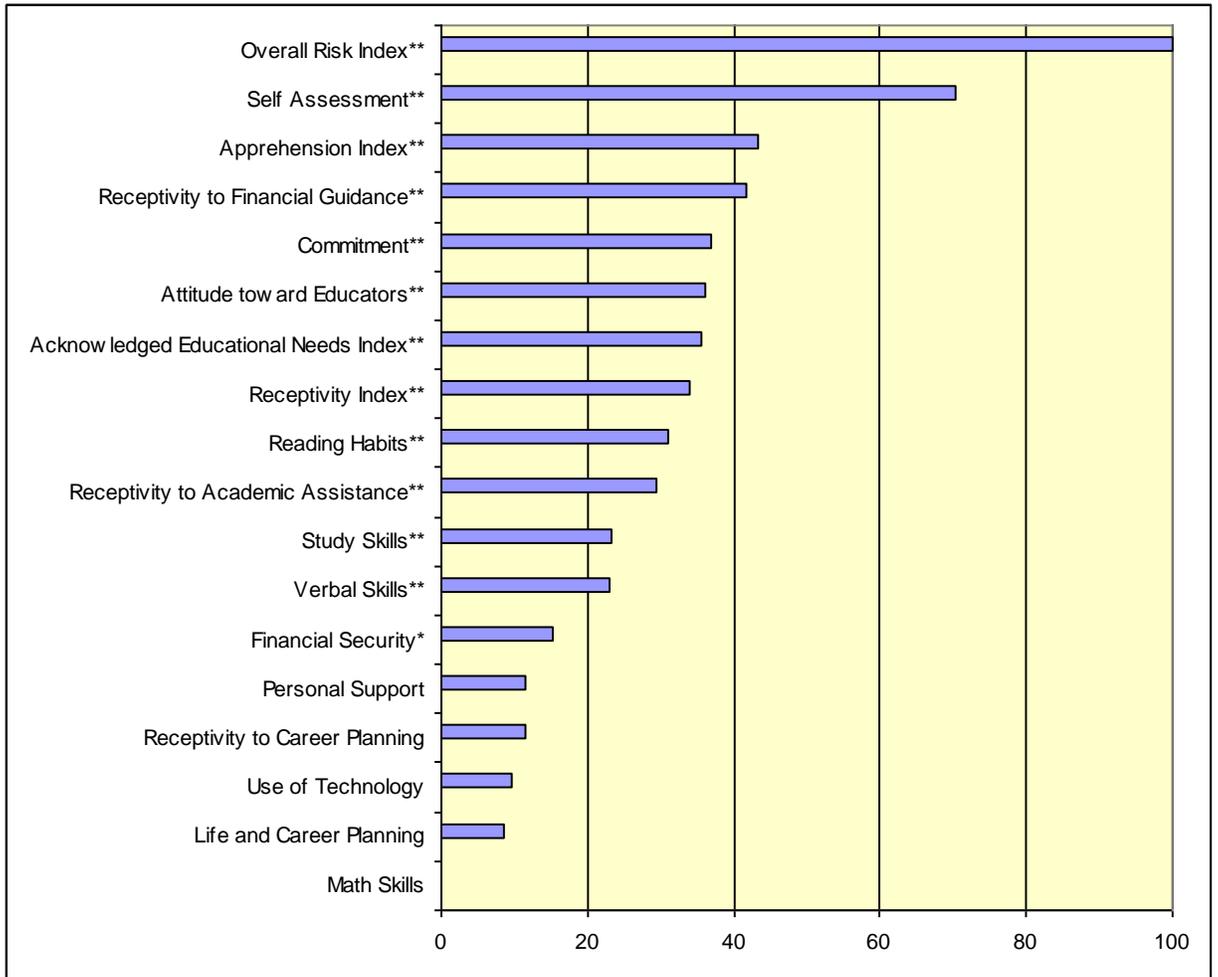
** Correlation is significant at $p < 0.01$.

This table shows that virtually all CSI-C scales show a predictive relationship to the student's cumulative GPA.

The Scales and the Risk Score (CSI – Form C)

When looking at the relative predictive validity of all scales to the risk index for CSI-C a similar picture emerges. As anticipated, the overall risk scale has the strongest correlation to the risk index (a correlation coefficient of 0.346). Again, this indicator outranks prior academic performance (self-assessment). The summary scores rank highly, as do the receptivity to financial guidance and the commitment to education scores.

Figure 15: Relative Correlation of CSI-C Scales to the Risk Score



* Correlation is significant at $p < 0.05$.

** Correlation is significant at $p < 0.01$.

Construct Validity

Construct validity is the degree to which a given set of findings is consistent with a coherent, well developed theory. In validating an instrument that purports to measure mass, a medieval researcher who somehow managed to take his or her instrument to the moon may be dumbfounded to discover that the cue ball weighs less there than on earth. But such a finding would be considered evidence of the instrument’s validity today because of the coherent conceptual framework and supporting data provided by Newton’s (1687/1999) seminal work on motion and gravitation.

This section will evaluate the CSI’s construct validity through two types of analyses. First, it will briefly examine the theoretical and empirical basis for selecting CSI-A’s scales. To be a valid measure of the background and motivational variables pertinent to student outcomes in college, CSI-A’s scales should measure variables that general research in education and psychology have shown to be relevant to that goal. Second, the section will review several empirical studies relating CSI-A to variables that relate theoretically to the educational process or to the characteristics of successful students rather than directly to student outcomes.

Overview of Theoretical and Empirical Literature

Accompanying Morrison’s (1999) empirical results is an overview of some of the CSI-A’s theoretical and empirical background. Table 11 presents a summary of many of the points she cites; it also includes a number of additional findings in the literature on academic performance and persistence among college freshmen. The table is merely an initial effort to examine this voluminous literature. But it gives the reader a general sense of the research foundations that informed the design of the various forms of the CSI.

Table 11. Overview of Theoretical and Empirical Literature Relevant to CSI-A Scales

Motivational Scale

3. Theoretical Concepts and Empirical Literature

Academic Motivation

Study Habits	Using Weiner’s attribution theory (1985) as a general framework, Smith and Price (1996) found that many developmental students have an external locus of control (attributing the major causal factors in their lives to task difficulty and luck rather than to effort). Students low on the Study Habits scale are considered to possess such an external locus of control. Elliott, Godshall, Shrout, & Witty (1990) found that students who were high on self-reported study habits earned higher grades. Richardson and Sullivan (1994) found that the CSI-A’s Study Habits scale correlated more strongly with freshman GPA for at-risk students than did the SAT.
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Intellectual Interests	Cote and Levin (1997) found that the motivation for intellectual growth was a significant factor in predicting GPA, but they also found that the college experience does not strengthen this motivation as one might expect.
Academic Confidence	Richardson and Sullivan (1994) found that the CSI-A's Academic Confidence scale correlated more strongly with freshman GPA for at-risk students than did the SAT. Ethington (1990) found that academic self-confidence predicted college persistence. Lent, Brown, and Larkin (1986) found that a scales measuring self-efficacy predicted grades, persistence, and range of perceived career options among science and engineering students. Himelstein (1992) found that expected grades predicted GPA and completion of at least 1 course at a community college.
Desire to Finish College	Allen (1999) found that the CSI-A's Desire to Finish scale predicted persistence among minority students in a causal model. Schutz and Lanehart (1994) found that possession of long-term educational goals is related to academic performance. Wilder (1992) found that a low commitment to college is related to a pattern of declining GPA. Kaufman and Creamer (1991) found that students with higher goals showed the best academic performances in college.
Attitude toward Educators	Stratil (1988) has argued that students' general attitude toward educators may transfer to the educational process and facilitate or interfere with the learning process.
Social Motivation	
Self-Reliance	Geiger and Cooper (1995) and Smith (1968) found that self-reliance was related to academic success. Pascarella and Terenzini (1991) review evidence that autonomy increases during college.
4. Sociability	See Stoecker, et al. below.
Leadership	Ting (2000) found that leadership skills were positively related to GPA among Asian American freshmen. Tracey and Sedlacek (1985) and Sedlacek (1999) found that leadership success was related to student success in higher education.
General Coping	
Ease of Transition	Stoecker, Pascarella, & Wolfle (1988) have argued that social integration promotes commitment to education and that commitment promotes persistence. Himelstein (1992) found that feeling that one will fit in socially predicted course completion and GPA.
Family Emotional Support	Reitzes and Mutran (1980) develop and test a theoretical model relating family background and perceived importance of significant others to academic success. Just (1999) and Lapsley, Rice, and FitzGerald (1990) found that parent attachment was related to college adjustment. Ferry, Fouad, and Smith (2000) found that parental encouragement was directly related to grades in math and science courses.
Openness	Perry (1970) found that intellectual development in college is characterized by an increasing acceptance of the validity of multiple perspectives and the use of increasingly complex integrative processes. Similar results are reviewed by Pascarella and Terenzini (1991).
Career Planning	Himelstein (1992) found that clarity of career goal was related to completing at least one course at a community college. Thompson (1980) describes two retention-enhancement programs emphasizing career planning.

Financial Security	Himelstein (1992) found that feeling able to meet the financial burdens of going to college predicted rate of course completion and GPA at a community college.
Receptivity	
Academic Assistance	Polansky (1993) found that training in study habits improved retention among high-risk students. Karabenick and Knapp (1988) found a curvilinear relationship between need and seeking assistance with academic skills, such the students with moderate need sought more help than those with very high and very low need. They discussed this finding in terms of Weiner's (1985) attribution theory, in which (a) repeated academic difficulty is related to attributions of stable low ability and (b) these attributions arouse negative emotions (e.g., sadness, guilt, embarrassment, hopelessness, and resignation). Covington and Beery (1976) discuss how help seeking is threatening to the self-esteem of low achieving students.
Personal Counseling	Frank and Kirk (1975) found that personal counseling was related to greater rates of academic success and higher rates of retention. Glennen (1975) found that academically oriented intrusive counseling improved grades and persistence.
Social Enrichment	See literature cited under Ease of Transition.
Career Counseling	Although Lewallen (1993) found that the degree to which entering students have made a career choice is unrelated to persistence, Pascarella, Terenzini, and Hibel (1978) found that career counseling during college improved GPA.
General Receptivity	Himelstein (1992) found that willingness to seek help with a problem is related to completion of at least one course and GPA at a community college.
Miscellaneous	
Initial Impression	Himelstein (1992) found that institutional satisfaction is related to completion of at least one course and to GPA at a community college. Richardson and Sullivan (1994) found that the CSI-A's Initial Impression scale was more strongly related to freshman GPA for at-risk students than was the SAT.
Degree Aspirations (item)	Ethington (1990) found that degree aspirations predicted persistence.

Several additional studies have demonstrated CSI-A's construct validity by examining its relationship to the broader educational process or to the characteristics of successful students. An annotated bibliography of CSI research studies is posted to the MyNoelLevitz client communities.

Attitude Toward Professors

In a study by Stratil, 96 college students completed a subset of the CSI's scales and rated their best professor, worst professor and generalized ideal professor on 11 personality dimensions. The Attitude Toward Educators scale correlated positively with the tendency to give favorable ratings of both the best and worst professor on a variety of dimensions; this finding directly supports the construct validity of this scale. Academic Confidence correlated negatively with the desire for "approval" in professors, suggesting that students with weak academic confidence have a greater need for approval from professors. This finding supports the construct validity of the Academic Confidence scale. Students high in

openness tended to have an especially positive idealization of professors who are high in altruism, high in authenticity, low in “approvingness,” and low in conventionality. In terms of specific professors, the open students also preferred past professors who were high in self-disclosure. Thus, students who score high in openness want a warm, close relationship with professors who are frank and creative; this pattern strongly supports the construct validity of the Openness Scale.

Nelson-Denny Reading Test and Myers-Briggs Type Indicator

In this study, 266 college students completed the Nelson-Denny Reading Test and the Myers-Briggs Type Indicator. The Nelson-Denny correlated positively with Academic Confidence, Intellectual Interests, Openness, Self-Reliance and self-reported high school grades. The Intellectual Interests scale correlated positively with the intuitive/sensing dimension of the Myers-Briggs and leadership correlated positively with the extroversion/introversion dimension. The Openness scale correlated positively with both the intuitive/sensing and the feeling/thinking dimensions. Finally, the Study Habits scale correlated positively with the judging/perceiving dimension. These findings provide strong additional evidence of the CSI’s criterion and construct validity (Stratil, 1988).

Pre-College Attributes and Social and Academic Motivation

This study correlated the Academic Motivation scales of the CSI with measures of student aptitude and eventual degree aspirations. Significant correlations were found with all of the CSI Academic Motivation scales: Study Habits, Intellectual Interests, Academic Confidence, Desire to Finish College and Attitude Toward Educators. The study also examined aptitude and degree aspirations specifically among women students using the Academic and Social Motivation scales of CSI-A. This analysis found that women with higher aptitude seeking higher degrees had significantly higher scores on the following CSI scales: Study Habits, Intellectual Interests, Self-Reliance, Sociability and Leadership (Erickson, 1989).

Gender Differences

The CSI measures motivational tendencies that are deeply rooted in general personality structure, and research has established important motivational differences between the two genders (Beall and Sternberg, 1993; Geary, 1998). Considerable evidence supports the conclusion that females are better adapted to tasks aimed at building a social support network in which children can be raised successfully. By contrast, men are better adapted to tasks aimed at establishing dominance, building coalitions to conduct warfare, managing intergroup power relations, and understanding and manipulating large-scale features in the environment (Geary, 1998). As an illustration of how gender differences may affect college adjustment, Strahan (1999) found that women earn higher GPAs in the first two years of college than did men. These findings suggest that women and men may respond somewhat differently on the CSI. It is also reasonable to hypothesize a gender by persistence interaction, such that the relationship between CSI-A variables and persistence is expected to differ between women and men.

To examine these hypotheses empirically, gender and persistence were used as categorical variables in a series of ANOVAs for each of the CSI-A's primary and composite scales. A total of 14 significant results were obtained in the analysis of gender differences on CSI-A at four-year institutions. These findings are reported in Table 12. In the area of academic motivation, all seven of the scales manifested significant differences. Women were higher than men in Study Habits, Intellectual Interests, Desire to Finish, and Attitude toward Educators. Men were higher in Academic Confidence, self-rated academic ability, and self-rated academic knowledge. These findings suggest that women are generally have higher levels of academically oriented self-discipline and more positive toward the school environment, whereas men are more confident of their intellectual resources.

Table 12. Analysis of Variance for CSI Scales in Relation to Gender and Gender by Persistence Interactions

Four-year Colleges, N = 4098

Scale	Gender F-ratio	p	Female M (SD)	Male M (SD)	Gender X Persistence F-ratio	p
Academic Motivation						
Study Habits	105.84	0.0000	56.7 (28.1)	45.9 (27.9)	1.23	ns
Intellectual Interests	133.29	0.0000	52.0 (28.7)	38.6 (27.3)	0.45	ns
Academic Confidence	23.15	0.0000	53.6 (26.2)	58.2 (25.7)	0.30	ns
Desire to Finish College	83.84	0.0000	56.4 (27.4)	46.4 (27.7)	0.05	ns
Attitudes toward Educators	91.46	0.0000	47.6 (29.6)	37.2 (27.9)	0.72	ns

Self-Rated Academic Ability	32.12	0.0000	4.04 (0.92)	4.22 (0.97)	1.26	ns
Self-Rated Academic Knowledge	21.93	0.0000	3.7 (0.83)	3.86 (0.87)	0.00	ns
Social Motivation						
Self-Reliance	1.37	ns	52.8 (28.4)	52.9 (28.0)	2.94	ns
Sociability	17.17	0.0000	57.7 (28.7)	51.3 (27.8)	5.64	0.02
Leadership	16.82	0.0000	61.0 (28.2)	55.0 (28.7)	3.61	ns
General Coping						
Ease of Transition	0.20	ns	47.5 (28.9)	46.2 (27.7)	0.93	ns
Family Emotional Support	48.31	0.0000	55.4 (28.5)	47.8 (26.9)	0.04	ns
Openness	43.25	0.0000	52.3 (27.4)	44.1 (29.2)	1.25	ns
Career Planning	18.65	0.0000	45.0 (29.8)	41.1 (28.7)	3.12	ns
Sense of Financial Security	0.55	ns	57.2 (28.8)	59.0 (27.4)	2.38	ns
Receptivity						
Receptivity to Academic Assistance	4.43	0.04	46.4 (28.2)	44.8 (26.9)	0.78	ns
Receptivity to Personal Counseling	14.71	0.0002	44.2 (28.8)	47.9 (27.9)	0.98	ns
Receptivity to Financial Guidance	1.32	ns	51.1 (28.1)	49.1 (28.0)	1.07	ns
Receptivity to Social Enrichment	44.87	0.0000	54.6 (28.2)	46.2 (27.8)	1.41	ns
Receptivity to Career Counseling	0.73	ns	56.1 (27.7)	53.8 (26.6)	3.85	0.05

Miscellaneous						
Initial Impression	17.15	0.0000	53.6 (28.7)	48.6 (29.7)	0.02	ns
Transfer Proneness	3.35	ns	49.5 (26.0)	51.5 (25.2)	0.01	ns
Senior Year High School Grades (4-point scale)	75.52	0.0000	3.37 (0.55)	3.17 (0.62)	0.86	ns
Cumulative GPA (4-point scale)	23.06	0.0000	2.80 (0.72)	2.63 (0.72)	1.77	ns
Self-Reported Aptitude (raw item scores; female n = 2001; male n = 1996)	49.82	0.0000	4.79 (1.21)	5.06 (1.20)	1.56	ns
Composite Scales						
Dropout Proneness	114.21	0.0000	39.7 (27.1)	50.8 (27.9)	0.79	ns
Predicted Academic Difficulty	69.30	0.0000	45.7 (27.2)	54.0 (26.9)	1.46	ns
Educational Stress	2.31	ns	43.6 (27.5)	46.4 (28.4)	2.44	ns
Receptivity to Institutional Assistance	4.11	0.05	50.5 (27.1)	47.7 (26.4)	0.84	ns

Notes: (1) When the main effect for gender is statistically significant, the larger mean is shown in bold.

Two of the three scales involving social motivation showed significant differences. Women were higher than men in sociability and leadership. In the area of general coping, three scales showed significant differences: Family Emotional Support, Openness, Career Planning. Again women were higher on each scale. Regarding receptivity, women were higher than men on Receptivity to Academic Assistance and Receptivity to Social Enrichment; men were higher on Receptivity to Personal Counseling. On the miscellaneous variables, women were higher on Initial Impression, senior year high school grades, and freshman GPA. But the men reported higher academic aptitude scores (ACT, SAT, or an average of the two; see CSI-A items 18 and 19). Thus, the women earned better grades in high school and college, but the men had higher test scores. The men's higher scores on Receptivity to Personal Counseling may be an indication of the difficulties that contemporary young men are experiencing in accepting the prospect of four more years of education and in working in a largely service-dominated economy. One might argue that both of these activities conflict with the traditional masculine gender-role.

The gender differences on the composite scales reflect the above findings. Men were higher on dropout proneness and predicted academic stress, whereas women were higher on general receptivity.

Only two gender-by-persistence interactions were significant. Level of Sociability did not relate to men's persistence, but women persisters were more sociable than were women leavers. Similarly, level of Receptivity to Career Counseling did not relate to men's persistence, but women persisters were more receptive to such intervention than were women leavers. Except for these two interactions, CSI-A predicted persistence equally well for women and men at four-year schools.

One of the findings that is especially relevant to the above findings is the fact that females of all ages are generally better readers than males (Geary, 1998). Given that reading is one of the central activities in educational settings, it is easy to understand why men show less interest in college than do women, generally underachieve academically, and leave at higher rates than women. The general tendency of males to feel dissatisfied with school is illustrated in research by Nichols and Good (1998), who examined junior high and high school students' perceptions of the fairness of school rules. In this case, the dissatisfaction that males feel toward an environment emphasizing female-oriented activities may manifest itself as a perception that the environment is "unfair."

The results of the gender and gender-by-persistence interactions at two-year institutions are reported in Table 13. Women are again higher than men in all areas of academic motivation. There were no gender differences in social motivation. In the area of general coping women were higher than men in openness, whereas men were higher in Sense of Financial Security. There was only 1 significant difference in receptivity, where women were higher than men on receptivity to academic assistance. In the miscellaneous area, women were high on Initial impression and senior year high school grades. The composite scales again manifest the above differences. Men had higher scores on Dropout Proneness and Predicted Academic Difficulty, whereas women higher on general Receptivity. There were no gender-by-persistence interactions at two-year schools.

Table 13. Analysis of Variance for CSI Scales in Relation to Gender and Gender X Persistence Interactions**Two-year Colleges, N = 968**

Scale	Gender F-ratio	p	Female M (SD)	Male M (SD)	Gender X Persistence F-ratio	P
Academic Motivation						
Study Habits	27.03	0.0000	53.4 (28.2)	43.4 (27.5)	0.92	ns
Intellectual Interests	60.56	0.0000	52.8 (29.4)	38.3 (27.0)	1.04	ns
Academic Confidence	11.91	0.0006	45.4 (28.9)	51.6 (27.5)	0.09	ns
Desire to Finish College	23.77	0.0000	45.8 (28.6)	37.0 (28.1)	0.51	ns
Attitudes toward Educators	19.30	0.0000	54.0 (29.6)	46.0 (29.9)	2.40	ns
Self-Rated Academic Ability	6.18	0.02	3.41 (0.93)	3.57 (1.02)	1.39	ns
Self-Rated Academic Knowledge	8.85	0.003	3.12 (0.83)	3.28 (0.88)	0.30	ns
Social Motivation						
Self-Reliance	0.16	ns	50.1 (30.6)	50.8 (28.4)	0.00	ns
Sociability	0.33	ns	43.7 (28.2)	43.1 (27.6)	2.50	ns
Leadership	1.38	ns	45.3 (30.0)	43.5 (28.6)	2.23	ns
General Coping						
Ease of Transition	0.15	ns	51.6 (28.5)	51.4 (26.8)	2.39	ns
Family Emotional Support	1.46	ns	46.2 (29.7)	43.9 (27.2)	0.12	ns
Openness	25.55	0.0000	46.8 (29.5)	37.3 (28.9)	0.35	ns

Career Planning	2.98	ns	45.9 (29.1)	42.7 (27.8)	0.26	ns
Sense of Financial Security	10.55	0.002	41.6 (27.9)	47.5 (28.4)	0.77	ns
Receptivity						
Receptivity to Academic Assistance	6.71	0.01	45.7 (30.2)	41.5 (29.5)	0.40	ns
Receptivity to Personal Counseling	0.23	ns	44.7 (30.0)	44.3 (27.8)	1.26	ns
Receptivity to Financial Guidance	0.02	ns	47.3 (28.3)	47.9 (27.6)	0.16	ns
Receptivity to Social Enrichment	5.07	ns	33.2 (26.9)	30.1 (26.1)	2.84	ns
Receptivity to Career Counseling	1.46	ns	46.2 (28.0)	44.3 (27.5)	0.00	ns
Miscellaneous						
Initial Impression	20.41	0.0000	49.1 (29.6)	40.6 (28.7)	0.34	ns
Transfer Proneness	2.79	ns	57.8 (28.4)	60.8 (27.1)	0.85	ns
Senior Year High School Grades (4-point scale)	11.84	0.006	2.95 (0.66)	2.80 (0.71)	0.88	ns
Cumulative GPA (4-point scale)	0.90	ns	2.58 (1.12)	2.44 (1.15)	1.81	ns
Composite Scales						
Dropout Proneness	14.76	0.0002	51.8 (29.1)	59.3 (27.9)	0.00	ns
Predicted Academic Difficulty	12.37	0.0005	50.0 (28.7)	57.1 (27.6)	0.56	ns
Educational Stress	0.08	ns	54.2 (29.9)	54.5 (28.6)	0.98	ns
Receptivity to Institutional Assistance	5.82	0.02	41.6 (28.9)	37.8 (27.8)	0.56	ns

Note: (1) When the main effect for gender is statistically significant, the larger mean is shown in bold.

Age Differences

Impetus for the development of the CSI-C was the observation that the motivational assessment tools used by campuses (CSI-A and CSI-B) are geared toward new college students, with the majority of them being 18-year-old freshmen. Thus, many scales and items that apply to younger students are not as appropriate for older and returning students.

Statistical tests comparing adults to younger students using the CSI-B have shown that the responses of older students (age 25 and older) on this instrument are significantly different from those of younger students (age 24 and younger). Older students in general showed a stronger commitment to their educational goals, displayed stronger Intellectual Interests, and reported stronger Study Habits and a higher Verbal and Writing Confidence, but lower Math and Science Confidence. They were more likely to be focused on a specific career and to report financial distress than younger students. They were less sociable than younger students, not seeking new social contacts, but demonstrated a higher Opinion Tolerance. Overall, it was clear that the CSI-B contained some scales that stopped short of reflecting the specific concerns and challenges of adult learners. (This awareness served as the initial impetus for developing the CSI Form C instrument, which has since expanded to serve adult and traditional learners alike.)

The pilot study included students of multiple age categories. 60 percent were 25 years and older and 40 percent were 24 years and younger. Statistical tests revealed that the survey responses for students 25 and older differed significantly from those students 24 and younger on one or more items from each scale. The trend of differences mirrored those between older and younger students from the scales on the CSI-B.

The Role of Decision Making in College Student Retention

By Herbert Bruce, Ph.D., Director, First-Year Programs, Lynchburg College (VA)

Note: Currently, Dr. Bruce serves at Armstrong Atlantic State University (GA)

Student persistence and retention is based on the decisions students make. Porter (2000) lists two fundamental choices that college students must face, whether to continue their education and whether to continue their education at the current institution. While scholars have considered how high school students choose which college to attend (Bradshaw, Espinoza, & Hausman, 2001; Govan, Patrick, & Yen, 2006; Hossler & Gallagher, 1987; Smith, 1994) as well as the process by which students determine their major (Bergeron & Romano, 1994; Galotti, 1999; Galotti et al., 2006; Kiener, 2006), they have not considered the role of decision making on student retention and attrition. Retention theorists expect students to take a careful, deliberate approach to decisions of such importance. However, in many cases, students make impulsive choices, even if the stakes are high (Byrnes, 2002, 2005; Steinberg & Scott, 2003). Students who tend to use an intuitive, heuristic approach to decision making will not consider all of the information available and use only a few characteristics to come to a conclusion (Klaczynski, 2001). In fact, some students may have already made up their minds about staying or leaving college before they begin classes. These premature, impulsive decisions may cause a student to leave an institution that ultimately may meet the needs of the student and produce a satisfactory relationship between the student and the institution. The objective of this study is to determine if the

decision-making style of the student plays a role in predicting one-year retention of first-year students at a private liberal arts college.

Mortenson (2005) reports the average retention rate (percentage of those students who return for their second year of college) has slowly declined over the past 18 years to 74 percent, which is consistent with the most recent data from American College Testing (2006). With a first-year retention rate of 74 percent and an average institutional graduation rate of 52 percent, more than half of all individual college departures occur from matriculation to the start of the second year, indicating that the first year of college may be the most crucial in assisting students towards graduation.

The Study

From the literature, retention may be considered a function of Initial Goal Commitment, Initial Institutional Commitment, academic skills, Ability to Pay, Student Background Characteristics and, for this study, the Student's Decision-Making Process. The independent variables of Initial Goal Commitment (GC-1), Initial Institutional Commitment (IC-1), Ability to Pay (ATP), and Initial Decision-Making Process (DM-1) will be estimated using subscales Desire to Finish College, Initial Impression, Sense of Financial Security, and Openness, respectively, of the College Student Inventory (CSI), an instrument designed to assist college personnel in determining individual risk factors that students' possess at matriculation (Noel-Levitz, 2002). Incoming academic skill will be estimated by Scholastic Aptitude Test (SAT) scores and high school grade point average (HSGPA). Additional variables include in-state status, minority status, gender, level of financial need, and parental education level. A summary of the independent variables is listed in table 14. The dependent variable for this study is student retention at one year (R1). Because the dependent variable is dichotomous, either a student is retained or not, a logistic regression analysis was conducted for three sets of variables.

Table 14. Independent variables used in this study

Symbol	Variable	Construct
Finish	Desire to Finish College	Initial Goal Commitment
FinSec	Financial Security	Ability to Pay
InitImp	Initial Impression	Initial Institutional Commitment
Open	Openness	Initial Decision-Making Process
HSGPA	High School Grade Point Average	Incoming Academic Skill
SAT	Scholastic Aptitude Test combined math and verbal scores	Incoming Academic Skill
Minority	Minority Status	Student Background Data
InState	In-state Status	Student Background Data
Gender	Gender	Student Background Data
Need	Level of Financial Need	Student Background Data
HiParEd	Highest Level of Parental Education	Student Background Data

The study reviews the data of four cohorts of freshmen entering fall semesters from 2003 through 2006 at a small liberal arts college in central Virginia. The college administers the College Student Inventory (CSI) to all incoming freshman students to assist in identifying at-risk students and providing a basis for intervention. The participation rate for taking the CSI averaged 98.6 percent for the 2003 to 2006 cohorts. The 2,233 students who have completed the CSI during these years comprise the data set for this study.

The college's freshman-sophomore retention rate of 71 percent is at the median of the 115 institutions classified in southern region (range of 33-92 percent). In 2006, the college had 1,966 full-time undergraduate students with another 99 full-time graduate students. Total enrollment, including part-time students, was 2,398 students, with about 92 percent of these students living on campus or in college-owned housing. African American students were the largest minority with 159 students (6.6 percent of total student body) and the college had 111 students in other minority categories. Female students make up 58 percent of the student population. The 2006 entering freshman class consisted of 553 students averaging a 3.11 high school grade point average and 1032 Scholastic Aptitude Test combined math and verbal score. The freshman-to-sophomore retention of the college has varied from 66 to 76 percent during the time period of this study.

The decision-making process of students can be predicted by the Openness subscale of the CSI. Developed to be an indicator of intellectual development as described by Perry (1999/1970), the Openness subscale is a measure of the tendency of students to listen to and accept new ideas (Noel-Levitz, 2002). Through Klaczynski's (2005) work, intellectual development is related to the decision-making tendencies and will be used to estimate the students' incoming tendencies to use analytic or experiential decision making as they approach complex issues such as persistence in college.

Logistic regression assumes linearity of ordinal and interval variables with the logit function (Hosmer & Lemeshow, 2000). All of the continuous variables met the assumption of linearity except for the Open quartiles which exhibiting a U-shaped curve when plotted against the categorical coefficients. The variable was transformed into a binomial variable representing either low or high level of openness. In order to isolate those students with a low level of openness (students who would tend to use the experiential process to make decisions), I recoded the first quartile of Openness as zero, representing the lack of analytic decision-making tendencies, and the remaining quartiles as one, indicating a greater propensity to use analytic decision making. This coding system also allows for cognitive development and can account for those students in the second quartile who develop more effective analytic decision-making skills between the time period when they took the CSI and when they made the decision to stay or leave the college.

Model 1: Base Model With Interactions Terms

Braxton and Hirschy's (2005) theory of college student retention predicts the significance of the three main variables Initial Goal Commitment (Finish), Initial Institutional Commitment (InitImp), Ability to Pay (FinSec) and the two interaction terms, Initial Goal Commitment by Initial Institutional Commitment and the Ability to Pay by Initial Institutional Commitment. Additionally, according to the theory, there is no direct interaction between the Ability to Pay and Initial Goal Commitment. However, several

researchers suggest that the ability to pay for college may influence Initial Goal Commitment (Glynn, Sauer, & Miller, 2003; Tinto, 2004); therefore the interaction term of Finish by FinSec is included in this model and all subsequent models to account for this possible interaction.

The results of the logistic regression analysis are listed in Table 15. Finish as a main variable is a significant contributor to the model ($\beta=0.0146$, $p=0.01$) while InitImp may be considered significant ($\beta=0.0071$, $p=0.23$) as a main variable in logistic modeling (Hosmer & Lemeshow, 2000).

Table 15. Regression coefficient estimates for reduced Model 1 using Student Retention at one year as dependent variable

Variable	β	S.E.	Wald	p
Finish	0.01455**	0.0058	6.255	0.012
FinSec	-0.00151**	0.0042	0.126	0.722
InitImp	0.00709**	0.0059	1.468	0.226
Finish by FinSec	-0.00011**	0.0001	1.826	0.177
Finish by InitImp	-0.00012**	0.0001	2.992	0.084
FinSec by InitImp	0.00019**	0.0001	5.434	0.020
Constant	0.23361**	0.2692	0.753	0.386

* $p<0.10$, ** $p<0.05$

This model confirms the tenants of Braxton and Hirschy's (2005) theory of retention, indicating that there are significant interactions between Initial Institutional Commitment and Initial Goal Commitment as well as between Initial Institutional Commitment and the Ability to Pay. The interaction term, Finish by FinSec, which represents the interaction between Initial Goal Commitment and Ability to Pay, is not significant at traditional levels, which continues to support the theory.

Model 2: Base Model and Decision Making with Interactions Terms

Model 2 consists of the previous model having the interaction terms Finish by FinSec, Finish by InitImp, and FinSec by InitImp, while including the variable Initial Decision Making (Open) and the interaction terms of interest in this research, Finish by Open and InitImp by Open. The results of the logistic regression analysis are listed in Table 16. The addition of these interaction terms creates a significantly different model than the previous model, with the change in the -2 log likelihood value equaling 4.92 (2 df, $p=0.09$). The interaction terms Finish by FinSec, Finish by InitImp and FinSec by InitImp together with the interaction term involving Open and InitImp are all significant by either traditional measures or may be considered significance in logistic regression.

Table 16. Regression coefficient estimates for reduced Model 2 using Student Retention at one year as dependent variable

Variable	β	S.E.	Wald	p
Finish	0.01809**	0.0069	6.883	0.009
FinSec	-0.00175**	0.0043	0.168	0.682
InitImp	0.00147**	0.0065	0.052	0.820
Open	-0.25820**	0.2467	1.095	0.295
Finish by FinSec	-0.00011**	0.0001	1.833	0.176
Finish by InitImp	-0.00017**	0.0001	5.212	0.022
FinSec by InitImp	0.00019**	0.0001	5.693	0.017
Finish by Open	-0.00243**	0.0049	0.243	0.622
InitImp by Open	0.01072**	0.0050	4.672	0.031
Constant	0.35247**	0.2913	1.464	0.226

*p<0.10, **p<0.05

Model 3: Addition of Student Background Factors

Model 3

Contains all of the variables and interaction terms previously considered while controlling for student background variables. The student background factors available for this study include Level of Financial Need (Need), Minority Status (Minority), In-state status (InState), Gender, and Highest Parent Education Level (HiParEd). The results are listed in Table 17. The addition of the background variables resulted in a likelihood ratio of 13.1 (5 *df*, $p=0.02$) indicating that adding these factors creates a significantly different model than Model 2.

Table 17. Regression coefficient estimates for reduced Model 3 using Student Retention at one year as dependent variable

Variable	β	S.E.	Wald	p
Finish	0.02058**	0.0070	8.727	0.003
FinSec	0.00202**	0.0045	0.202	0.653
InitImp	-0.00123**	0.0065	0.035	0.851
Open	-0.35195**	0.2549	1.906	0.167
Finish by FinSec	-0.00014**	0.0001	2.991	0.084
Finish by InitImp	-0.00018**	0.0001	5.466	0.019
FinSec by InitImp	0.00020**	0.0001	5.883	0.015
Finish by Open	-0.00302**	0.0050	0.363	0.547
InitImp by Open	0.01098**	0.0050	4.814	0.028
SAT	0.00022**	0.0004	0.238	0.626
HSGPA	0.79653**	0.1114	51.081	<0.001
Need	-0.02280**	0.0367	0.386	0.534
Minority	-0.02536**	0.1379	0.034	0.854
InState	0.30714**	0.1041	8.706	0.003
Gender	0.11420**	0.1126	1.029	0.310
HiParEd	0.10053**	0.0488	4.244	0.039
Constant	-2.97053**	0.6067	27.470	<0.001

*p<0.10, **p<0.05

Finish and HSGPA remain significant contributors to the model with p-values of less than 0.01 for both factors. The interaction terms Finish by FinSec, Finish by InitImp, FinSec by InitImp and InitImp by Open continue to be significant in Model 3 at approximately the same p-value as before. A 10 percentage point increase in FinSec and InitImp individually from the mean while holding all other variables at their mean or mode increases the probability of student retention by 0.8 and 1.8 percentage points respectively, while a decile increase in Finish does not affect the probability of retention significantly, less than 0.1 percentage points. A 10 percentage point increase in the HSGPA increases the retention probability by 2.3 percentage points while a similar increase in the SAT scores increases the chances of being retained by the college by 0.3 percentage points, holding all other factors constant. The lower Open level reduces the probability of being retained by 1.0 percentage point as compared to a student having a high level. An increase in the Need level quintile (indicating a reduced level of financial assistance and presumably an increase in FinSec) lowers the probability for retention by 0.3 percentage points, which is about one half of the effect of a numerically equivalent but opposite change in FinSec.

Of the student background factors, only InState ($\beta=0.3071$, $p<0.01$) and HiParEd ($\beta=0.1005$, $p=0.04$) are significant while none of the remaining factors had small enough p-values to even be considered as potentially significant in logistic regression modeling.

However, in comparisons of students who remained for their second year and those who did not, gender was the only background factor significantly different between the two groups of students ($\chi^2=0.082$, $p=0.08$) while InState ($\chi^2=0.104$, $p=0.16$) and HiParEd ($t=0.67$, $p=0.25$) were not. The direct contributing effects of these two student-entry characteristics, highest level of parental education and in-state status, cannot be confirmed by these results as either or both of the factors may have significant interactions with Initial Goal Commitment, Initial Institutional Commitment and/or Ability to Pay. Braxton and Hirschy (2005) suggest their primary contribution is in an interaction with one of the constructs.

A change to minority status reduces the probability of remaining at the college for a second year by 0.4 percentage points while shifting from an in-state student status to that of an out-of-state student reduces the retention probability by 5.1 percentage points. Additionally, female students have a 1.8 percentage point greater probability of retention than male students.

Students with at least one parent who graduated from college are more likely to be retained by 1.5 percentage points over those students whose parents attended college but did not graduate. The model also predicts students with at least one parent who graduated from college having a 3.3 percentage points better chance of remaining for their second year than those whose highest education level is a high school diploma. The odds ratio for persisting to the second year was 1.22 for student having a parent with a college degree as compared to those students whose parents had no college experience, which is especially noteworthy since socioeconomic factors were controlled through FinSec and Need.

The interaction of Openness with Initial Impression was significant. For the majority of students, a change in Openness from 0 to 1 increases the chances of being retained. For students most likely to use experiential decision making (i.e., Open=0), a decile increase in InitImp from the mean increases the probability of being retained by 0.2 percentage points, while students who tend to make decisions by using an analytic method (Open=1) have an increase of 1.8 percentage points in retention probability for the same change in InitImp. These results suggest that students using experiential decision making are less inclined to change their mind based on initial impression of the college than those using an analytic decision-making model, consistent with the findings in Model 2.

Discussion

The Role of Decision Making in College Student Retention

The construct IC-1 has significant interactions with decision making as a student reaches subsequent institutional commitment, estimating student persistence at the college. For students with at least moderate levels of InitImp, the presence of Openness leads to an increased likelihood they will remain on campus for their second year of school. Students who tend to use analytic decision-making methods have more variability in their persistence decisions and may be receptive to change their impressions of the college. Those students may take a more comprehensive look at the college and review more characteristics than they previously considered at matriculation as they make their final decision to remain or leave. They may even remain at the college they are attending even if it was not their first choice depending on their interactions with the college, rather than relying on their original institutional commitment.

Students who tend to use experiential decision making may rely on their initial commitment to the college to determine if they will remain at a particular institution rather than taking additional information into account before making the decision to remain. Perhaps for those students, the impression they have of the institution does not change appreciably even after interactions with the college and they are not inclined to reconsider their initial conclusion. The addition of Open and the interaction term with InitImp to empirical models statistically improves the effectiveness of the models to predict retention. The manner in which a student considers the many variables involved in the complicated process of determining whether to persist at a particular institution appears to influence the final decision.

Policy Implications

Although the validity of the current study may be limited for other institutions, it appears that the impression that a student holds of the college will largely determine if he or she will remain at the institution or look to transfer. Less selective and open admission colleges may be at greater risk for impression-driven departures since many students may already have formed at least a preliminary negative impression of college before interacting directly with the college and those who use experiential decision making as the primary way to reach conclusions may not be receptive to new information. If correct, these conclusions imply that colleges that are not among the elite should focus their attention to the initial interactions with potential applicants. The research suggests there may be great rewards for institutional efforts in this area.

The initial impression of the college begins to take shape during the initial contacts with the college, through the media, the Internet, and the publications produced by the higher education marketing firms designed to attract the prospective student. The college can further develop this impression through subsequent interactions between the student and college personnel. Correspondence with prospective students continues for orientation and with other college personnel, including residence life and information technology staff members, as the students begin to set up accounts and register for classes. These interactions, together with the initial interactions students have with their professors, residence assistants, coaches, food services staff, and maintenance staff after matriculation, contribute to their initial impression of the college, laying the foundations for future persistence decisions. If the student predominately uses experiential decision making, the student may have reached the decision whether to stay or leave the college within the first few days of arriving, while students using analytic decision making may delay their final decision to allow future interactions to help them reach a persistence conclusion. Initial impressions, especially for less selective colleges and universities, are formed over several months through many interactions with various departments within the institution. Each of these interactions is critical to developing a positive initial impression of the college.

In this study, the interaction of Sense of Financial Security by Initial Impression is the most significant interaction term in the final model, suggesting that students look for educational value as they select a college. They may also continue to re-evaluate the cost and the benefits as they proceed through their first year in college. For the college in this study, a list of the institutions to which students transferred indicate 16 of the top 18 landing schools are public, with 14 of those 16 being community colleges. The conclusion can be drawn that the cost of the institution played an important role in determining the final outcome of a student's decision. Students who were not performing well, either academically or socially,

together with their parents may conclude that there was not value added by the institution and decide to transfer to a less expensive option where the educational value is more in line with the student's (and the parents') expectations.

Colleges need to clearly present the value added by the institution in terms that the student and their families can understand. For this particular college, it may be emphasizing the individual attention students obtain in the small class sizes or the opportunities for leadership on a small campus. An internal marketing campaign may be useful in helping current students understand the value of the college, thus affirming the decisions students have already made to attend.

The level of openness which estimates the predominant decision-making method indicates if a student is receptive to considering options. Students using an experiential method of deciding may benefit from courses designed to improve their critical thinking and metacognition skills. Development of these skills may help students realize that there may be other characteristics or factors to consider when making an important decision and that a visceral reaction may not be the most appropriate approach.

For those students predominately using an analytic approach to decision making, continued student recruitment is a priority. Students must be convinced of the value of the institution as they match their impression of the college with expectations that they hold for college. As some of these expectations may not be appropriate or reasonable, students need to be challenged on unreasonable expectations so that they do not simply transfer to other institutions only to discover their expectations are misguided. In the age of instant communication with students on other college campuses, students are continuing to evaluate how well their college suits them. Therefore, recruitment should not be limited to prematriculation. At all times, colleges, especially those not among the elite, need to continuously re-recruit and re-enroll their students.

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Exploratory Study of CSI-A Motivational Styles

Michael L. Stratil, Ph.D.

Overview

This study presents exploratory research on a potentially promising new direction for the CSI. The findings are preliminary but very encouraging. The 2 central premises of the study are that (a) each person's mind is a coherent system of thoughts and emotions and (b) optimal interpretation of motivation must take that coherence into account.

Consider the implications of these premises for the CSI. Like most motivational assessment instruments, the CSI employs a set of scales to measure a corresponding set of underlying motivational processes. Each scale is designed to be linear (i.e., to tap a continuum from low to high) and unidimensional (to tap only one continuum). The resulting scale scores are inferred to be manifestations of the strengths of the respondent's tendencies on the various underlying processes without regard to how these processes relate to one another.

As appealing as this methodology is for its practicality and ease of comprehension, it is clear that the brain is not organized into a set of independent processes. There is overwhelming evidence that the brain is a complex system of closely interacting processes. Neural activities in a given anatomical area of the brain frequently have significant effects on the simultaneous activities occurring elsewhere in the brain. Often we respond to situations with a configuration (pattern) of interrelated responses rather than through a single response or a set of multiple independent responses.

One of the challenges of contemporary psychometrics, then, is to discover methods for studying the interrelations among psychological processes. In simple terms, how can a set of multidimensional scores from inventories like the CSI be analyzed in a way that accurately reflects the brain's underlying configurations? What is needed is a configural method of studying psychological processes.

The importance of this issue for the CSI can be seen in an example. Suppose two students are both very ambitious; they both have a strong desire to get ahead in life. One student, however, is endowed with a high level of academic aptitude, so that intense studying has often been followed by academic success. For this student, ambitiousness and academic talent are mutually facilitating: the presence of one facilitates the other. Now consider another student, one who has a much more limited natural endowment of academic talent. By the time this student graduates from high school, his intense studying has often been followed by frustration and anxiety rather than gratification. School comes to be experienced as an obstacle to success, and a complex of negative feelings attaches to every aspect of the educational environment. The point is not just that low academic talent generates dislike of school. A third student who has equally low talent as the second but possesses much less ambitiousness might not experience the same degree of frustration as the second student because he or she does not become as involved in academic goals. Thus, it is the combination of ambitiousness and low talent that is especially frustrating for the second student. This example illustrates why it is important to understand each student's individual pattern of CSI results as a whole rather than as a set of independent scores.

The need for a configural approach to the study of student outcomes is illustrated in the study of persistence. Astin (1975) and others have found that students leave college for a

variety of reasons, some favorable and some unfavorable. Hackman and Dysinger (1970) have offered the following succinct summary of the most general patterns of leaving:

Thus, while persisters tend to be both talented and committed, there appears to be three distinguishable routes to attrition, corresponding to the three withdrawal categories used in the present research:

- Students with solid academic competence but moderately low commitment tend to withdraw from college, but to transfer to another institution or to re-enroll at the same school later (transfers/returnees).
 - Students with poor academic qualifications but moderately high commitment tend to persist in college until they finally are forced to leave because of poor academic performance (academic dismissals).
 - Students with both low commitment and moderately low academic competence tend to withdraw from college and not re-enroll in the same school or elsewhere.
- (p. 321)

Although these three categories need to be further subdivided on the basis of other variables, they illustrate the general nature of a configural approach to student outcomes.

Earlier it was found that men and women have different global patterns on CSI-A. In a more configural analysis of CSI motivational patterns, it is expected that these broad gender differences will further manifest themselves through the differentiation of more specific patterns. Therefore, the present study will examine configural patterns separately for women and men.

The present study thus has three goals: (a) to identify the primary motivational configurations that occur with CSI scores, (b) to identify the separate motivational patterns for women and men, and (c) to provide a preliminary assessment of the validity of these CSI configurations. The general hypothesis is that CSI scores are organized into subtle but meaningful patterns that are not apparent except through careful statistical analyses designed specifically for that purpose. The procedure is based primarily on a statistical technique called cluster analysis. Cluster analysis is an important method in the field of taxonomy, where it is used, for example, to classify plants based on dimensional measurements (e.g., number of leaves, stem length, method of pollination).

Tomkins' (1979, 1987) concept of script is a very useful framework for understanding configural results in motivation. At one level, people's motivation tends to be organized into scripts containing plots and images, and associated emotions. According to Tomkins, people condense information about a class of experiences into a coherent plot of action-outcome relationships, a set of discrete, focused images of the outcomes, and emotional responses to those images. The various components of the script are strongly integrated, so that the activation of one component leads to the activation of other components. When a person encounters a new situation that resembles the script, he or she interprets it in terms of the script's plot. The plot then activates a pattern of emotional responses. Seeing a textbook and a desk, for example, may activate a plot for studying, taking exams, and earning good grades. These expectations activate feelings of pride and security. The textbook thus triggers a series of interrelated mental activities.

Motivational inventories like the CSI can be conceptualized as measuring the distinct components of scripts. The Study Habits scale, for instance, focuses largely on measuring a student's plot for studying, whereas the Academic Confidence scale focuses largely on measuring the student's outcome images and emotional responses to the activity of studying. In this way, the different scale scores tend separate the student's responses into distinct parts (traits). We know where the student stands on each trait, but we do not know how the traits are related to one another. To gain a coherent understanding of the student's motivation, it is essential that these parts be reintegrated. This is where cluster analysis is helpful: it identifies clusters of students who have the same style of integrating the primary motivational dimensions.

The ultimate goal of this study is to provide the professionals who use the CSI (e.g. advisors, counselors) with a concise, empirically based, configural interpretation of each student. Such an interpretation will enable them to gain a rapid understanding of each student's motivational "story." This configural interpretation is expected to help professionals to better intuit the kinds of emotionally toned expectations and plot interconnections that are often the core of student motivation. Each configuration will be called a *motivational style*.

It is important to recognize that the present study is merely the first phase in the study of motivational styles. Like any scientific method, the study of motivational styles must be amenable to empirical validation. The first task will be to provide a more complete validation of the interpretations of the styles. Then research will be needed to test the effectiveness of different types of interventions with each style.

What are the types of evidence that can tell us whether we are on the right or wrong track in our interpretations of the different styles? The following criteria are appropriate to such a line of research:

- Although the styles may possess some overlapping characteristics, each should possess sufficient distinctiveness to warrant its separate consideration;
- Each style should possess a configuration of correlates (e.g., other attitudinal measures) and academic outcomes (e.g., performance, persistence, and social behavior) that is consistent with a coherent theoretical rationale;
- The classification of a student into a given style category should provide more information than is provided by the simple scale scores.

Method

All statistical analyses were performed by Stratil using Statistica AX6.0 (StatSoft, 2001). The statistical procedure used in the present study is similar in some ways to that employed by Pulkkinen's (1996) in a study of male and female types. After identifying a primary set of clusters, he searched deeper into the cluster hierarchy in order to identify a set of subclusters. But he expanded his analysis into subclusters by increasing the number of clusters sought by Ward's procedure. This method reorganizes the data in ways that are not strictly hierarchical, which decreases cluster reliability at a rapid rate.

An alternative approach to subcluster expansion was employed in the present study. As in Pulkkinen's (1996) study, a preliminary cluster analysis was performed as the basis for defining a small set of primary clusters. But a set of secondary cluster analyses were

performed *within* each primary cluster rather than on all the cases at once. This approach appears to solve the fundamental problem one often encounters in using cluster analysis. On the one hand, one must keep the number of variables to about five or less in order to obtain reliable cluster solutions. Similarly, one must keep the target number of clusters to about five for the same reason. On the other hand, an analysis based on only four or five clusters is too broad to have much practical value; the large amount of intra-cluster heterogeneity results in many marginal classifications in which the individual does not closely match any of the cluster definitions. Put succinctly, people are too idiosyncratic to fit into a typology composed of only 4 or 5 types.

The present procedure solves these problems by (a) reducing the number of variables through factor analysis and (b) conducting the cluster analyses in a series of hierarchical stages.

Factor Analysis

The procedure begins by conducting an exploratory factor analysis of the CSI-A's major scales using a normalized varimax procedure. The sample consisted of an equal number of female and male (N = 4088) freshmen students attending a diverse set of 14 four-year colleges and universities during the academic years of 1997-98 and 1998-99. They will be referred to as the 1999 Study (four-year). This analysis yielded a solution with the five factors given earlier in Table 3. Factor scores and coefficients were computed from this analysis. These coefficients allowed the factor solution to be generalized to additional samples.

Cluster Analysis

These factor scores were submitted to a seven-step cluster-analytic procedure. The steps in this procedure are as follows.

First, an agglomerative joining procedure with Ward's algorithm was applied separately to a large sample of women students and a large sample of men students. These analyses indicated a four-cluster solution for women and a separate four-cluster solution for men. The decision regarding the number of clusters to seek in this procedure was based on guidelines recommended by Aldenderfer and Blashfield (1984). Although these guidelines are very useful, they do not provide a definitive framework. Some intuitive considerations remain, which makes the procedure somewhat subjective. The problem of subjectivity was considered minimal at the level of primary clusters, but in deciding on the number of subclusters (clusters within the primary clusters) the degree of subjectivity was more significant but still manageable.

Second, a k-means cluster analysis using Ward's algorithm was applied to these data in order to obtain separate sets of cluster assignments and cluster coefficients for women and men.

Third, the joining procedure using Ward's algorithm was separately applied to the 8 groups formed from the cluster assignments obtained in the previous step. The goal of this step was to identify subclusters within each cluster. These analyses identified a total of 11 subclusters for women and 12 subclusters for men.

Fourth, a systematic set of descriptive labels was developed for these 23 subclusters based on the mean factor scores for each subcluster. Four rules were followed in applying labels:

(a) the order in which the factors were listed reflected the extremity of the factor score means within the subcluster, with the most extreme factor listed first, the next most extreme factor listed next, and so forth; (b) any factor whose subcluster mean was greater than or equal to one standard deviation was preceded by “V” (for “very”); (c) only factors exceeding 0.5 standard deviation were included in the description; and (d) negative subcluster means were preceded by “Lo” for (“low”).

Fifth, discriminant analyses were performed on the subcluster assignments obtained in the previous step. These analyses yielded 11 sets of discriminant coefficients for the women and 12 sets for the men. These discriminant analyses were not performed in a hierarchical manner; rather, all subclusters for one gender were studied in one analysis. This procedure was followed for two reasons: (a) if discriminant analysis had been conducted within primary clusters, a misclassification at the primary level would have placed a subject in a cluster for which no appropriate subcluster existed, necessarily resulting in an erroneous final classification and (b) a comparative analysis of both methods found that the analysis on all subclusters at once produced results that were at least as meaningful as those from a within cluster discriminant analysis. Thus, the hierarchical approach was effective in developing the original primary and secondary cluster solutions, but a simple one-level discriminant analysis was most effective in defining the final discriminant coefficients.

Sixth, subcluster classification scores were computed for the original sample using the discriminant coefficients obtained in the preceding step.

Seventh, the discriminant coefficients were then applied to two additional samples, yielding subcluster classification scores and subcluster assignments for each subject. One of these samples consisted of an equal number of male and female freshmen attending six two-year institutions during the 1998-99 period (N = 968). Not only was the number of institutions involved in this study much smaller than the number in the 1999 four-year study, the distribution of subjects across institutions was also much less even (70.9% were drawn from one institution and 24.1% were drawn from another). This study is called the 1999 Study (2yr). The other sample consisted of the subjects in the original CSI-A study conducted in 1990. It contained 2675 freshman women and 2281 men attending a diverse set of 15 institutions, most of which were four-year schools. The distribution of subjects across the institutions was fairly even. The results from this sample will be labeled 1990 Study (4-yr).

The concurrent variables used in this study are from the Part B of CSI-A. They include the student’s self-reported (a) assessment of her or his high school’s academic standards, (b) goals for highest degree, (c) estimate of personal time to be spent studying, (d) assessment of college’s academic standards, (e) parents’ education, and (f) academic aptitude test scores.

Results

Application of the above hierarchical cluster analytic method to the 1999 data set resulted in the identification of 11 female and 12 male motivational styles. Each participant was classified into one of these styles, and the classifications were then analyzed by discriminant analysis to obtain 2 sets of discriminant coefficients. The coefficients were then applied back to 1999 data set, yielding final style classifications. All subsequent concurrent analyses for validation were run using these final style classifications. In this way, the results reported below reflect the types of findings that one should expect when the

discriminant coefficients are applied to new samples that are entirely independent of the original sample.

To further assess the generalizability of the styles and their concurrent implications, the discriminant coefficients were applied to archival data from the 1990 study of mostly four-year institutions.

In the following discussion of the data, the styles will first be defined in terms of group means on the 5 factors. A characteristic in which the cluster mean differs by 1 or more standard deviations from the 1999 grand mean for four-year institutions (females plus males, N = 4088) will be shown in bold italics. Characteristics in which the cluster means differ by at least 0.5 standard deviation from the four-year grand mean will then be listed in the order of the magnitude of the cluster mean-grand mean differences.

All concurrent findings are based on post hoc comparisons from one-way, between-styles ANOVAs. The modified Tukey's HSD test for unequal ns developed by Spjotvoll and Stoline (1973) was applied in all analyses. The alpha level was set at .05 for two reasons. First, the research goal is exploratory. The study is intended to provide a preliminary assessment of the construct validity of the proposed CSI-A motivational styles, not to prove their validity at a high level of certainty. Second, the intention was to focus on findings that replicated across two large samples, thus reducing the likelihood of Type I errors.

These post hoc tests were conducted according to the following procedure. On a given dependent variable, a given style's mean was compared to the means of all the other styles to ascertain its position in the distribution of means. The number of means that reliably exceeded its own on the Tukey test was calculated, as was the number of means that reliably fell below its own. The results of these comparisons are presented in tables based on the following conventions. If a given style's mean is reliably greater than the mean of 1 other style, the word High is entered into the appropriate cell of the table. If the mean for the focal style is reliably greater than the mean for 2 to 4 other styles, a single asterisk is added (High*). When the focal style's mean is reliably greater than that of 5 or more other styles, a double asterisk is added (High**). Likewise, if the focal style's mean is reliably less than that of other styles, the word Less followed by 0, 1, or 2 asterisks is entered, according to the same rules described above.

In interpreting these findings, the absence of both words (neither High nor Low) indicates that the style's mean was approximately in the center of the distribution. Thus, the members possessing the style in question are roughly average on the dependent variable. Often a style is High relative to some other styles and Low relative to others; these signs offset one another, again indicating that the style is approximately in the center of the distribution. If a style is described only as High, it is slightly above average on the dependent variable. If it is High*, it is considered somewhat high in the distribution, and if it is High** it is considered very high (at or close to the top) in the distribution. Similar interpretations apply to Low, Low*, and Low**.

Each of these comparisons was performed for both the 1990 and 1999 four-year samples, and the results were entered in adjacent columns in the table. In constructing the integrative summaries at the end of the presentation, all of the signs were weighed and an appropriate summary description developed. Thus, a style might have High in the 1990 column and Low in the 1999 column, yielding the inference that it would be essentially in the center if the two samples were combined. Most of these conflicting indications occur with means

that are centrally located, but occasionally more complex findings were obtained. The latter are summarized in a way that was judged as best describing the overall trend across the two samples.

Discussion of the primary tables will focus on issues of special significance to the general hypotheses of the study. More detailed analysis of the implications for each style will be reserved for the integrative summaries at the end of the women's and men's sections.

Women's Motivational Styles

Style Definitions and Academic Performance

The factor definitions of the 11 female motivational styles are given in Table 18. The styles are arranged in the order of the respective freshman-year grade point average (GPA). The style number simply indicates its arbitrary order in the original cluster analysis, and it is given merely as a concrete label to simplify the discussion and add continuity across tables.

To illustrate how the styles were defined, let us examine style 7. The mean factor score that most strongly differentiates this style from other styles is the group's very low social adjustment. The next most important differentiator is the group's very high mean on the academic competence factor. Both of these differentiators are described with the word *Very* to indicate that the factor score means are at least 1.0 standard deviation greater than (or less than) the grand mean for women. Thus, the mean for the women in style 7 was at least 1 standard deviation below the mean on the social adjustment factor and at least 1 standard deviation above the mean on the academic competence factor. On the third most important factor, academic motivation, their mean factor score was greater than 0.5 and less than 1.0 standard deviation higher than the grand mean. Likewise, they were somewhat high in attraction to the institution and somewhat low in family support.

The remainder of the styles are defined in a similar manner. Only factors whose mean scores diverge by at least 0.5 standard deviation are included in a style's definition, so that some styles (3, 9, 10, 6, 1, and 4) are defined by only 3 factors because only three factors met this criterion.

Table 18. Cumulative Grade Point Average and CSI Motivational Styles for Women at Four-Year Institutions (1990 and 1999 Studies Combined)

Female Style #	Cumulative GPA	First Factor	Second Factor	Third Factor	Fourth Factor	Fifth Factor
7	3.22	Very low social adjustment	Very High academic competence	High academic motivation	High attraction to institution	Low family support
11	2.96	High attraction to institution	High academic competence	High academic motivation	High family support	
3	2.90	Very low attraction to institution	High receptivity	High family support		
5	2.78	Very low	High	High social	High	

		family support	receptivity	adjustment	academic competence
2	2.72	Very low attraction to institution	Very high academic motivation	Low receptivity	High social adjustment
8	2.67	Very high academic motivation	Very low receptivity	Very low family support	High attraction to institution
9	2.62	Very low social adjustment	Low receptivity	Low attraction to institution	
10	2.62	High attraction to institution	High family support	Low academic motivation	
4	2.42	High receptivity	Low academic competence	Low family support	
1	2.36	Very low attraction to institution	Low academic competence	High family support	
6	2.31	Very low social adjustment	Very low academic competence	High attraction to institution	

Note. The cumulative GPAs are unweighted means of 1990 (4-yr) study and 1999 (4-yr) study.

One of the most significant findings from Table 18 is that there are three quite distinct motivational styles related to high GPA (styles 3, 7, and 11) among women. The distinctiveness of these styles can be seen in a comparison of the factor constituents. Most strikingly, not a single factor is common to all three styles. Two styles are high in attraction to institution, but the third is very low on this factor. Similarly, two styles are high in family support, but the third is low on this factor. Two styles (3 and 11) share high factor scores on family support, but the other style is low on this factor. Another set of two styles (7 and 11) share high factor scores on academic competence and academic motivation, but neither of these factors is significant in the third style. This diversity among the successful women strongly supports the configural theory on which the present study is based: it indicates that the continuum from high to low academic success is not comprised merely of simple incremental increases on co-varying variables.

Two of the high performance styles raise important theoretical questions. Regarding the top style (7), the question arises as to the motivational dynamics underlying the presence of social problems among the women with this style. Do these social problems contribute in some systematic manner to the high academic achievement attained by these women? Specifically, is the academic success of these women motivated by a need to compensate for underlying social anxieties and frustrations? Regarding style 3, the presence of very low attraction to the institution is an especially salient finding. What is the cause of these

negative feelings and how do they relate to the students' relatively high academic achievement? These are issues that will be addressed to some extent in the evidence on concurrent validity, and they deserve more detailed examination in future research.

Among the motivational styles associated with medium freshman GPA, medium academic competence as measured by the CSI-A is common to 4 of the 5. At this level, then, there is at least one fairly strong commonality. But these styles show no appreciable commonality on any of the other factors.

The three women's motivational styles related to low freshman GPA continue the trends found with the other styles. Low academic competence is common to all there, but there is no other commonality. Indeed, there are two factors on which two of the styles have opposite mean scores. Whereas style 1 is very low on attraction to institution, style 6 is high. Styles 1 and 4 are opposite on family support. A central theoretical question regarding the low-achievement styles pertains to institutional support: Do the distinctive components of these styles provide a basis for formulating differentiated intervention strategies? That is, do the styles help advisors and counselors to better recognize and understand the individual differences among low-performing students? This is an issue that will be addressed later.

Overall, there is strong support for the distinctiveness hypothesis. Except for levels of CSI-A measured academic competence, the motivational styles having roughly equivalent mean GPAs are quite distinct. This finding holds at the high, medium, and low levels of academic performance, and it is consistent with the low correlations shown in Table 19 for all variables except academic competence.

Table 19. Correlations between Women's Freshman GPA and CSI-A Factor Scores

CSI-A Factor	1990 Study	1999 Study
Social Adjustment	-.04	-.08**
Receptivity	.06*	.02
Academic Competence	.39**	.40**
Academic Motivation	.11**	.10**
Family Support	.04	.07**
Attitude toward Institution	.05*	.04

* $p < 0.05$. ** $p < 0.001$.

One of the most striking findings in this study is the virtually perfect correspondence between the 1990 study at four-year schools and the 1999 study at four-year schools in the relationship between motivational styles and GPA relationship. Table 20 shows a Pearson correlation of .99 between these two patterns. The coefficient confirms the visual impression provided by Figure 1, in which the contour of the 1990 line (shown with a solid line and solid black markers) parallels the contour of the 1999 four-year line (shown with a large dashed line and a starburst marker). The abbreviations used in this diagram are shown below. This finding is theoretically important because it suggests that the each style possesses a coherent set of motivational underpinnings that emerge in different historical

settings and in separate but comparable four-year institutional settings. That is, it supports the configural premises of the study.

Figure 16

Key to Abbreviations				
Scale	High (z => .5)	Very High (z => 1.0)	Low (z =< -.5)	Very Low (z =< -1.0)
Social Adjustment	Soc	VSoc	LoSoc	VLoSoc
Receptivity	Rec	VRec	LoRec	VLoRec
Academic Competence	Comp	VComp	LoComp	VLoComp
Academic Motivation	Mot	VMot	LoMot	VLoMot
Family Support	Fam	VFam	LoFam	VLoFam
Attitude Toward the Institution	Att	VAtt	LoAtt	VLoAtt

The lower correlations between the two-year pattern and the four-year patterns (.72 and .74) is also important in supporting the conclusion that women’s motivational dynamics at two-year institutions are somewhat different than are those at four-year institutions. From a methodological and practical perspective, this finding suggests that two-year institutions should be studied separately from four-year institutions (i.e., participants from these two types of institutions should not be lumped together). Close examination of Figure 16 further shows that much of the discrepancy between the two types of institutions occurs with three motivational styles.² First, the two-year students with very low family support, high receptivity, high social adjustment, and high academic competence appear to have underachieved compared to the similar groups at four-year institutions. Perhaps these are students who would very much preferred to have attended a four-year institution but could not afford the costs. As a result, their motivation may have been disrupted. Second, the two-year students with very low attraction to the institution, high academic motivation, low receptivity, and high social adjustment appear to have overachieved compared to the similar groups at four-year institutions. Given that this group had a high rate of attrition (see Figure 17 below), it is possible that these students were attempting to prove that they could perform satisfactorily at the college level and, after having done so, then transferred to four-year institutions. Third, the two-year students with high receptivity, low academic competence, and low family support appear to have underachieved compared to the similar groups at four-year institutions. It must be emphasized that the empirical contrasts and

² As of the 2001 publication of this manual, the preliminary interpretations of these discrepancies are ad hoc and have not been assessed for statistical significance.

theoretical interpretations offered here are highly speculative. But they illustrate the interesting possibilities for future research that are generated by the motivational style methodology.

Table 20. Intercorrelation of Academic Performance-Attitudinal Pattern Relationships Among Three Female Samples

	1990 Study	1999 Study (2-yr)	1999 Study (4-yr)
1990 Study			
1999 Study (2-yr)	<i>0.72</i>		
1999 Study (4-yr)	<i>0.99</i>	<i>0.74</i>	

Coefficients in bold italics are significant at $p < .05$.

It is also interesting to note that the combination of very low social adjustment, very high competence, high motivation, and low family support emerged as the most academically successful female group at both two-year and four-year institutions. Thus, the interlocking motivational cohesion that underpins this style appears to be highly stable across institutional settings. Similarly, the students with very low social adjustment, very low competence, and high attraction to the institution appear to have the same very low academic outcomes regardless of institutional setting.

Institutional Persistence

The analysis now turns to the relationship between women's CSI-A motivational style and persistence. Table 21 reports the level of persistence for each of the 11 female styles. It is important to keep in mind that there is no theoretical reason to expect a close correspondence between grades and persistence given the inherent ambiguities of a simple, unpartitioned persistence rate. Some students leave because they are doing well academically and seek greater challenge, whereas others leave because they are failing or having significant social adjustment problems.

Table 21. Persistence and CSI-A Motivational Styles for Women at Four-Year Institutions

Female Style #	Percent Persisting	First Factor	Second Factor	Third Factor	Fourth Factor	Fifth Factor
7	87.2	Very low social adjustment	Very High academic competence	High academic motivation	High attraction to institution	Low family support
10	85.2	High attraction to institution	High family support	Low academic motivation		
11	84.7	High attraction to institution	High academic competence	High academic motivation	High family support	
5	82.1	Very low family support	High receptivity	High social adjustment	High academic competence	
3	78.5	Very low attraction to institution	High receptivity	High family support		
4	74.5	High receptivity	Low academic competence	Low family support		
8	70.9	Very high academic motivation	Very low receptivity	Very low family support	High attraction to institution	
9	69.5	Very low social adjustment	Low receptivity	Low attraction to institution		
1	67.3	Very low attraction to institution	Low academic competence	High family support		
6	65.3	Very low social adjustment	Very low academic competence	High attraction to institution		
2	64.0	Very low attraction to institution	Very high academic motivation	Low receptivity	High social adjustment	

Note. Persistence rates are unweighted means of 1990 (four-year) study and 1999 (four-year) study.

As with the women's performance data, the most striking implication in the persistence results can be seen in Figure 17 showing the patterns across different styles for the 3 studies. There is again a very close correspondence in the contours of the 1990 and 1999 four-year students. As reported in Table 22, the correlation between them is .94. Moreover, the divergence of the two-year students from both of the four-year groups is even more pronounced than was found with persistence. The correlation between two-year and 1990

four-year was only .20, and the correlation between two-year and 1999 four-year was only .14. Clearly, the retention implications for motivational styles at two-year schools are quite different than at four-year schools.

Figure 17

Table 22. Intercorrelation of Persistence-Attitudinal Pattern Relationships Among Three Female Samples			
	1990 Study	1999 Study (Two-Year)	1999 Study (Four-year)
1990 Study			
1999 Study (2-yr)	0.20		
1999 Study (4-yr)	0.94	0.14	

Coefficients in bold italics are significant at $p < .05$.

Most of the discrepancies occur with the styles that have the highest persistence rates at four-year schools (i.e., those appearing at the top of the figure due to the arrangement of styles from top to bottom based on the mean persistence rates at four-year schools). There were four such groups. First, the women with high attraction to the institution, high family support, and low academic motivation were much more likely to leave at two-year schools than at four-year schools. A hypothesis about these students is that those attending two-year schools began their studies with little commitment to their education. They appear to be reasonably well adjusted overall but simply disinclined to pursue a path for which they are not well suited. Those at four-year schools, although possessing a similar low level of academic motivation (in terms of confidence and gratification), appear to be more committed to making the best showing they can. A closer examination of specific scale differences might provide more information regarding this hypothesis, but that is beyond the scope of the present study.

The second highly discrepant style was composed of two-year women with very low family support, high receptivity, high social adjustment, and high academic competence. Their discrepancy was the greatest of all the groups. Given that they have a high degree of academic competence and, as seen in Figure 17 above, some underachievement, it may be that the motivation of many of these women is being undermined by their very low level of family support. Fairly outgoing students who usually have the intellectual capacity to succeed, they may lack the familial support structure needed to nourish a level of career motivation adequate to sustain the pursuit of a college degree.

Third, the women with a very unfavorable attitude toward the institution but high receptivity and high family support showed a moderate amount of discrepancy at two-year schools. Given that this group had the third highest mean GPA (see Table 18 above), it appears that many of these students may be departing two-year schools because of academic success rather than failure: that is, they have proven to themselves and their family that they have the personal resources needed to succeed, and they are now moving on to a four-year school.

Fourth, the last two-year group that was sharply discrepant from the four-year groups (style 4) was composed of students possessing high receptivity, low academic competence, and

low family support. Given that this group has low academic competence and earned the lowest freshman GPA (see Figure 1 above), it appears that their leaving is being caused primarily by academic difficulties and discouragement.

Overall, the data on persistence strongly support the general premise that implications of motivational style for two-year students are somewhat different than they are for students attending four-year institutions. The implications of the persistence data for four-year women will be discussed later in the section summarizing the various analyses. Some of these outcome differences may be due to the manner in which the motivational styles interact with differences in institutional settings. That is, a given style may motivate students to respond favorably to one type of institution and unfavorably at a different type of institution. The outcome differences may also be due in part to subtle self-selection factors. The students with a given CSI-defined motivational style who choose to attend a two-year school may possess undetected motivational differences compared with those who choose to attend four-year schools. The CSI's capacity to categorize students into motivational styles is certainly less than perfect, and some of the discrepancies found above may result from its limitations.

The relationship between performance and persistence is examined in Table 23. Most of the commentary on the results will be deferred until the summary tables, but there are two salient results that deserve brief mention. Group 2, which possesses very low attraction to the institution, very high academic motivation, low receptivity, high social adjustment, tends to leave at a rate that is highly discrepant from their relatively high performance. By contrast, the women in group 10, who possess a high attraction to institution, high family support, and low academic motivation, tend to persist at a rate much higher than their performance.

Table 23. Relationship between GPA and Persistence Rankings For Women's CSI-A Motivational Styles at Four-Year Institutions

Female Motivational Style #	Cluster description	GPA Rank	Persistence Rank	Difference
7	Very low social adjustment, very high academic competence, high academic motivation, high attraction to institution, low family support	1	1	0
11	High attraction to institution, high academic competence, high academic motivation, high family support	2	3	-1
3	Very low attraction to institution, high receptivity, high family support	3	5	-2
5	Very low family support, high receptivity, high social adjustment, high academic competence	4	4	0
2	Very low attraction to institution, very high academic motivation, low	5	11	-6

receptivity, high social adjustment				
8	Very high academic motivation, very low receptivity, very low family support, high attraction to institution	6	7	-1
9	Very low social adjustment, low receptivity, low attraction to institution	7	8	-1
10	High attraction to institution, high family support, low academic motivation	8	2	6
4	High receptivity, low academic competence, low family support	9	6	3
1	Very low attraction to institution, low academic competence, high family support	10	9	1
6	Very low social adjustment, very low academic competence, high attraction to institution	11	10	1

Extracurricular Activity

In an effort to provide some preliminary basis for evaluating the external validity of the interpretations given above, CSI-A's data relating to student involvement in extracurricular activities were studied through analyses of variance. The procedures were the same as those described in the earlier Methods section. Briefly, the indications High (Low) indicate that the style showed a high (low) mean on the activity, with asterisks indicating the number of comparisons showing this trend. Again, the implications of these findings will be discussed in the summary tables. All of the analyses of extracurricular activities were limited to women attending four-year schools. All indications are based on Tukey's HSD test for unequal sample sizes based on 1-way ANOVAs.

Table 24. Relationship between Women's Motivational Style and Extracurricular Activities at Four-Year Institutions (1990 Study)

Female Motivational Style	Extracurricular Activity						
	Athletics	Fine Arts	Organizational Officer	Special Interest, Social, Honorary, and Service Groups	Speech	Research	Writing
1. Very low attraction to institution, low academic competence, high family support	High	Low	High Low	Low**	Low		Low*
2. Very low attraction to institution, very high academic motivation, low receptivity, high social adjustment	High	High	High	High*	High		High
3. Very low attraction to institution, high receptivity, high family support	High		High	High*			High*
4. High receptivity, low academic competence, low family support	High		High	Low**	Low		Low
5. Very low family support, high receptivity, high social adjustment, high academic competence	High	High*	High**	High*	High*		High**
6. Very low social adjustment, very low academic competence, high attraction to institution	Low**	Low*	Low**	Low**	Low*		Low**
7. Very low social adjustment, very high academic competence, high academic motivation, high attraction to institution, low family support	Low		High	High**			High

8. Very high academic motivation, very low receptivity, very low family support, high attraction to institution		High	Low*	Low		Low
9. Very low social adjustment, low receptivity, low attraction to institution			Low	High Low		
10. High attraction to institution, high family support, low academic motivation	High*	Low*	High* Low	High* Low*	Low	Low*
11. High attraction to institution, high academic competence, high academic motivation, high family support	High	High*	High*	High*		High

* Indicates a comparison involving 2 to 4 other groups.
** Indicates a comparison involving 5 or more other groups.

To facilitate the identification of broader motivational tendencies among the extracurricular data, a principal components factor analysis using a normalized varimax rotation was performed with the four-year data for women and men combined. The factor loadings are given in Table 25. The analysis shows a very clear separation of the two factors. Factor 1 primarily measures involvement in intellectual activities, whereas factor 2 primarily measures involvement in social assertion. Only Leadership loaded heavily on both factors.

**Table 25. Factor Analysis of Extracurricular Activity Scores
Four-Year Institutions**

Extracurricular Activity	Factor 1	Factor 2
Athletics	-.22	.82
Fine arts	.63	-.16
Leadership (officer or captain)	.41	.64
Group member	.53	.29
Public speaking	.54	.03
Scientific research	.46	-.03
Writing	.53	.15
Eigenvalues	1.68	1.21
Proportion of total variance	0.24	0.17

Note: Loadings .40 or higher are in bold.

Table 26 reports the results of the relationship between women's motivational styles and the two extracurricular activity factors. The results show very strong consistency across the 1990 and 1999 studies at four-year institutions. Recall that both high and low indications for the same style either within or between studies indicates that the style should be considered as having moderate tendencies for that factor (e.g., style 1 is moderate on social assertion).

**Table 26. Relationship between Women's Motivational Style and Extracurricular
Activity Factors
Four-year Institutions**

Female Motivational Style	Intellectual Factor		Social Assertion Factor	
	1990 Study	1999 Study	1990 Study	1999 Study
1. Very low attraction to institution, low academic competence, high family support	Low**	Low**	High	Low*
2. Very low attraction to institution, very high academic motivation, low receptivity, high social adjustment	High	High**	High*	High*
3. Very low attraction to institution, high receptivity, high family support	High*	High**	High*	High*
4. High receptivity, low academic competence, low family support	Low*	Low*	High	High
5. Very low family support, high receptivity, high social adjustment, high academic competence	High**	High**	High*	High*

6. Very low social adjustment, very low academic competence, high attraction to institution	Low**	Low**	Low**	Low**
7. Very low social adjustment, very high academic competence, high academic motivation, high attraction to institution, low family support	High*	High*	High	High
8. Very high academic motivation, very low receptivity, very low family support, high attraction to institution	High	High*	Low*	Low**
9. Very low social adjustment, low receptivity, low attraction to institution	Low	Low*	High Low	Low**
10. High attraction to institution, high family support, low academic motivation	Low**	Low**	High	High*
11. High attraction to institution, high academic competence, high academic motivation, high family support	High*	High* Low	High*	High**

Miscellaneous

Table 27 reports the Tukey HSD ANOVA results on the relationship between women's motivational style and their parents' education, their degree aspirations, and their self-reported aptitude test scores.

Table 27. Relationship between Women’s Motivational Style and Parental Education, Degree Aspiration, and Aptitude Scores Four-year Institutions

Female Motivational Style	Parental Education		Degree Aspiration		Self-Reported Aptitude Scores (either ACT, SAT, or mean of both)	
	1990 Study	1999 Study	1990 Study	1999 Study	1990 Study (n = 2675)*	1999 Study (n = 2001)*
1. Very low attraction to institution, low academic competence, high family support	High**	High*	Low*	Low**	Low**	Low**
2. Very low attraction to institution, very high academic motivation, low receptivity, high social adjustment	High*	High*	High**	High*	High* Low	High* Low*
3. Very low attraction to institution, high receptivity, high family support	High*	High**	High*	High	High* Low	High* Low
4. High receptivity, low academic competence, low family support	High Low*	Low**	High Low*	Low*	Low**	Low**
5. Very low family support, high receptivity, high social adjustment, high academic competence	High*	High Low*	High**	High**	High**	High** Low
6. Very low social adjustment, very low academic competence, high attraction to institution	Low**	Low**	Low**	Low*	Low**	Low**
7. Very low social adjustment, very high academic competence, high academic motivation, high attraction to institution, low family support	High Low*	High	High*	High*	High**	High**
8. Very high academic motivation, very low receptivity, very low family support, high attraction to institution	Low**	Low*	Low*		High Low*	High* Low
9. Very low social adjustment, low receptivity, low attraction to institution	High Low	Low**	Low**	Low**	High* Low*	High* Low*

10. High attraction to institution, high family support, low academic motivation	High*	High*	Low*	Low*	High* Low**	High Low*
11. High attraction to institution, high academic competence, high academic motivation, high family support	High*	High**	High* Low	High*	High**	High**

* Some participants did not report test scores, so the ns refer to subsets of the total female samples.

Table 28 reports ANOVA findings on the relationship between women’s motivational style and their perceived high school academic standards, their perceived college academic standards, and their expectations of personal weekly study hours.

Table 28. Relationship between Women’s Motivational Style and Perceived High School Academic Standards, Perceived College Academic Standards, and Expected Hours of Study Four-year Institutions

Female Motivational Style	Perceived High School Academic Standards		Perceived College Academic Standards (high is “standards are just right”, low is “standards are too high”)		Expected Hours of Study	
	1990 Study	1999 Study	1990 Study	1999 Study	1990 Study	1999 Study
1. Very low attraction to institution, low academic competence, high family support		Low*	High	Low	Low**	Low**
2. Very low attraction to institution, very high academic motivation, low receptivity, high social adjustment	High	High*	High*	High**	High*	High*
3. Very low attraction to institution, high receptivity, high family support	High*	High*		High*	High*	High*
4. High receptivity, low academic competence, low family support	Low*	Low**	Low*	Low**		Low*
5. Very low family support, high receptivity, high social adjustment, high academic competence	High**	High*		High*	High	High*

6. Very low social adjustment, very low academic competence, high attraction to institution	Low*	Low**	Low*	Low**	Low*	Low*
7. Very low social adjustment, very high academic competence, high academic motivation, high attraction to institution, low family support		High**		High*	High*	High**
8. Very high academic motivation, very low receptivity, very low family support, high attraction to institution	Low*	Low		High	High	High*
9. Very low social adjustment, low receptivity, low attraction to institution	Low*	Low**		Low**	Low**	Low**
10. High attraction to institution, high family support, low academic motivation	Low	Low*	High	Low*	Low	Low*
11. High attraction to institution, high academic competence, high academic motivation, high family support	High*	High**	High*	High*	High*	High**

Integrative Summary

In this section, the large number of findings presented in the preceding tables will be integrated into a series of coherent portraits. The reader should keep in mind that the motivational style definitions and classifications contained in the left column are entirely independent of the validation information in the top subsection of the right column. The interpretive and scriptive subsections on the right then provide a synthesis of both the style definitions and the validation findings.

The interpretive section for each style should be understood as (a) medial and (b) speculative. The term medial is used here in a statistical sense, referring to the score lying at the center of a distribution of ranked scores. Suppose 5 people's weight in pounds is arranged in rank order as follows: (1) 193, (2) 185, (3) 168, (4) 159, (5) 142. In this distribution, rank 3 (168 lbs.) is the medial score. Applying this concept to the understanding of motivational styles, a given style is most descriptive of the individuals near the center of the distribution. The farther the person's scores differ from the cluster median, the less descriptive are the interpretations given in the tables below. This issue will be discussed at greater length in relation to the summary table for the least favorable women's style.

In addition to the issue of descriptive scope, it should also be understood that the interpretations are speculative. They are based loosely on post-Freudian psychodynamic and self theories of coping and personality functioning (e.g., Adler, 1958; Ansbacher & Ansbacher, 1956; Erickson, 1968, 1985; Horney, 1945, 1950; Janis, 1971; Rogers, 1951, 1961; Tompkins, 1991). Because they synthesize both the style definitions and the concurrent validity data, there is no additional validity data currently available for them.

The hypothesized scripts are an attempt to express the inferred experiences (both cognitive and affective) of a typical representative of the different styles. They too are highly speculative. Moreover, not every representative of a given style is expected to possess a script of the type ascribed to that style. Some women will not fit the style definition itself very well, so the typical script for that style will also be inappropriate for them. In other cases, motivational factors beyond the scope of CSI-A may significantly influence a student's experiences; the script will thus be inappropriate for that reason. In light of these qualifications, a given script should be viewed as merely a preliminary description of informed intuition about a given motivational style. Each script may prove to be a fairly accurate summary of many but not all the students possessing a given motivation style, but the degree to which that is true has yet to be studied empirically.

Table 29 summarizes the 3 motivational style definitions for the highest performing group of women (Mean GPA = or > 2.90). The women with style 7 provide an interesting illustration of the configural principles on which this study is based. When viewed from the perspective of a simple additive linear model of student outcomes, the style definition appears to possess a mixed set of indications. On the one hand, the very high competence, high motivation, and high attraction to the institution might be seen as favorable. But the very low social adjustment and low family support might be seen as unfavorable. To combine these conflicting indications by simply adding them together (++ , + , + , -- , -) might yield a net + or a ++ depending on how the factors are weighted. Thus, one might expect solid but not outstanding grades from the students with this style. Yet the actual result (in the upper right segment of Table 29) is the most favorable of any of the women's styles. How can this finding be explained?

Table 29. Integrative Summary of Findings Pertaining to the Most Favorable Women’s Motivational Styles Four-year Institutions (1990 and 1999 Studies)

Women’s Motivational Style	Concurrent Empirical Findings, Interpretations, and Hypothesized Scripts
7. Very low social adjustment, very high academic competence, high academic motivation, high attraction to institution, low family support	<p>Concurrent Findings: Very high GPA (M = 3.22); very high persistence (M = 87.2%); very strong concordance between GPA and persistence; very high involvement in intellectual extracurricular activities; moderately high involvement in socially assertive extracurricular activities; about average parental education; high degree aspirations; very high academic aptitude scores; perceives her high school as having moderately high academic standards; perceives her college as having slightly high academic standards; very high expectations of personal study time.</p> <p>Interpretation: The women with this motivational style appear to be very bright, highly motivated, and very successful academically. They also persist at a very high level. Even though they report feeling socially inadequate, they have a history of strong extracurricular activity. It is possible that the negative social factors in the lives of these women actually contribute to their high performance by motivating them to seek compensatory gratifications through achievement. Overall, their strong attraction to the institution should be reinforced by early recognition of their strengths. They should be encouraged to participate in honors programs, to become involved in directed study projects, and to give serious consideration to pursuing a graduate degree. They are likely to make significant extracurricular contributions to their institution.</p> <p>Hypothesized Script: But I’ve experienced a lot of problems in my family, and social situations often make me feel tense. Although I participated in a lot of activities in high school, often I found them unsatisfying or tension arousing. So I’m torn between approaching and moving away from others. My mind grasps information quickly, and I often feel a sense of satisfaction when I master some difficult new ideas. The intellectual life gives me a feeling of strength and purpose that I can’t find anywhere else. Therefore, intellectual competition and exploration are the types of experiences that bring me the most reliable satisfactions.</p>
11. High attraction to institution, high academic competence, high academic motivation, high family support	<p>Concurrent Findings: High GPA (M = 2.96); high persistence (M = 84.7); strong concordance between GPA and persistence; somewhat high involvement in intellectual extracurricular activities; high involvement in socially assertive activities; high parental education; moderately high degree aspirations; very high academic aptitude scores; perceives her high school and college as having high academic standards; high expectations of personal study time.</p> <p>Interpretation: The women with this motivational style appear to be very bright, well rounded, and strongly committed to their education. Although slightly underachieving, they appear to have a very solid core of self-esteem and a realistic attitude toward goal setting. They are probably effective leaders, and they will probably be very valuable assets to the institution outside the classroom. As a group, they appear not to have significant needs for institutional support, but they may have some circumscribed needs.</p> <p>Hypothesized Script: Overall, I’m very happy with life. My family is great, and</p>

	<p>they're supporting my education. My college is a nice place to live and study, and I feel very capable. My life seems well rounded. I get a lot of pleasure from socializing with others, but I'm also able to buckle down and study. I feel that I have reasonably good control over the direction of my life.</p>
<p>3. Very low attraction to institution, high receptivity, high family support</p>	<p>Concurrent Findings: High GPA (M = 2.90); average persistence (M = 78.5%); fairly strong concordance between GPA and persistence, with some degree of over-attrition; high involvement in both intellectual and socially assertive extracurricular activities; highly educated parents; high degree aspirations; academic aptitude scores slightly above average; perceives her high school's academic standards as high; perceives her college's academic standards as moderately high; high expectations of personal study time.</p> <p>Interpretation: The women with this motivational style tend to perform at a level that is somewhat above their ability level. They are also highly involved in extracurricular activities. They feel fairly good about their families and the level of financial support they are receiving. Their strong dissatisfaction with their institution may reflect an underlying feeling of inadequacy relative to their parents' status. They may want to prove themselves by attending a more prestigious school even though their test scores, on average, do not indicate the advisability of their do so. Because they seem to be fairly open to advice, it may be possible to help them see the suitability of their present institution. Overall, they are very good prospects for academic success, persistence, and extracurricular contributions to the campus.</p> <p>Hypothesized Script: My parents are very successful, and they've done a great job of providing for me. Because of this, I've always felt that I belonged in the upper strata of society. I admire my parents for what they've accomplished, and I want to carry on the family traditions. In school I've done pretty well, but I have to work hard. Sometimes I feel that I'm not as bright as my parents. This thought is very upsetting, and it motivates me to do the best I can. I was very disappointed when my test scores were not good enough to get me admitted into the school I wanted to attend, and I felt that I was slipping down to a level below my parents. As soon as I can I'd like to transfer to my preferred school so I'll feel more comfortable with myself and won't feel inferior to the people in my high school who went to more prestigious schools. I welcome any help that my teachers can provide.</p>

Psychodynamic principles suggest that talented and achievement-motivated individuals often respond to adversity by mobilizing and intensifying their achievement strivings. That is, the achieving process provides them with a stable method of reducing the distresses they experience in the adverse areas of their lives. In the case of the style seven women, one might argue that their focus on achievement has actually been intensified over time by the social issues in their lives. Intellectual activity may have become their central channel for reducing everyday distresses, and the gratification they have repeatedly experienced in performing this activity may have imbued it with a strong positive valence. Through stimulus generalization, this positive valence appears to have spread to academic institutions in general, including their current institution (at which their academic career is only beginning). They appear to be willing to make significant sacrifices (e.g., time and effort) to maintain the vital flow of this soothing gratification.

The rest of the available validation data from background variables supports the psychodynamic interpretation of style seven. The aptitude scores of these women, for example, confirm the very strong sense of academic competence found in the style

definition. Furthermore, they reported a stronger involvement in intellectually oriented extracurricular activities than in socially assertive activities (even though they are above average in both). The strength of the intellectual channel in their lives is further confirmed by their very high expectations of personal study time and their high academic aspirations. Their parents' education is only average for college students, suggesting that their intense motivation may be driven partly by the desire to improve their financial circumstances. In sum, there is a remarkable degree of consistency between the validation data and the psychodynamic explanation of style 7. Nevertheless, need to be supplemented by research that more directly address the hypothesized processes (e.g., compensation).

The consistency in the relationship between style seven and academic success also supports the study's general configural principles. If style seven were associated with high GPA in only one group, then one might doubt that the style has a strong configural underpinning of interlocking causes. But we have seen that this motivational style is characteristic of the highest performing women in two separate studies of women attending four-year institutions as well as in one study of women attending two-year institutions. It is thus associated with consistent behavioral manifestations. The style is not a fluke of sampling error in a single sample.

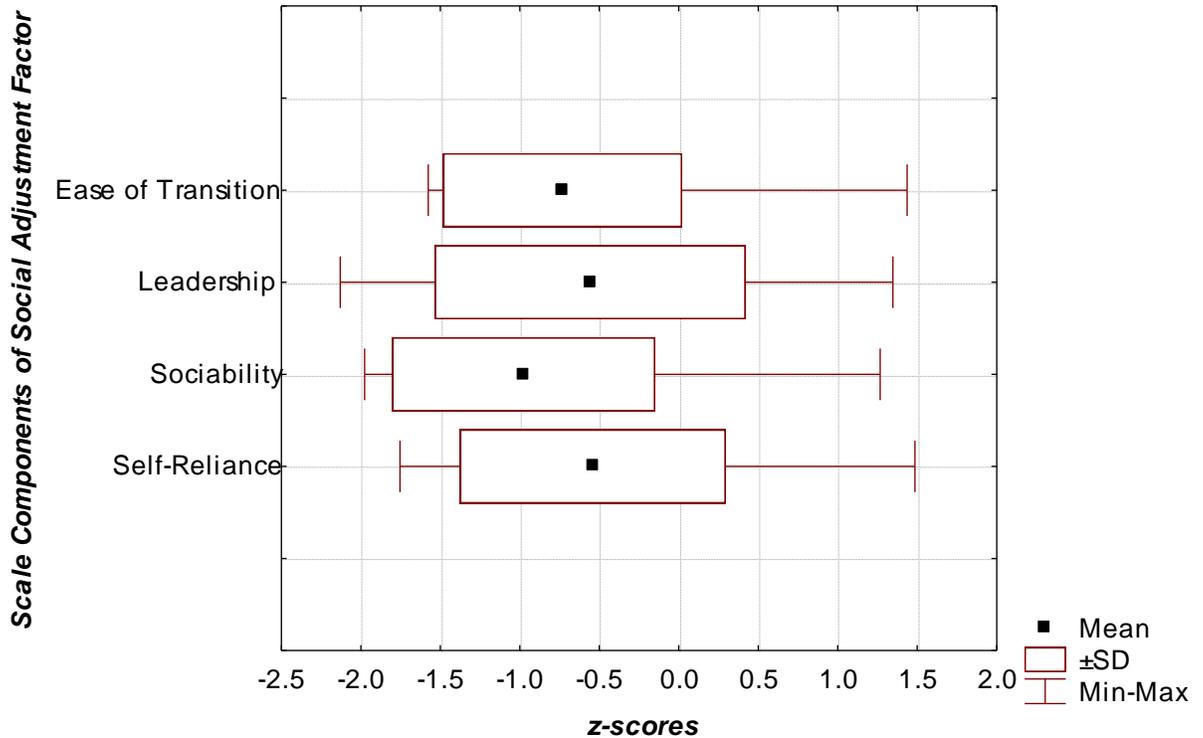
Despite the coherence and consistency of the style seven findings, it is very important to recognize that it is not comprised of a highly homogeneous group of students. The members of each style are a family of somewhat similar, but far from identical, individuals. This principle is illustrated in the box and whisker plots reported in Figure 18. Each plot shows the distribution of style seven women on 1 of the 6 primary factors. The style mean is shown by the small black square, and the range from 1 standard deviation above to one standard deviation below the mean is shown by the top and bottom limits of box. The maximum and minimum scores are shown by the whiskers (horizontal lines at the ends of the distribution). The figure clearly illustrates two principles that apply to all of the styles. First, the means agree with style 7's definition (e.g., the mean for style seven on the social adjustment factor is below the -1.0 criterion, the mean on academic motivation is over 1.0, and so forth). Second, there is considerable within-style variation on each of the factors. Thus, a few style seven students are actually above the mean on social adjustment, whereas a few others are down in a range close to three standard deviations below the mean. The whiskers indicate that there are some quite significant outliers in each distribution. One must be careful to search for these outliers in interpreting the reports of individual students. The middle 68 percent (as represented by the limits of the box) possess a much narrower range, but even this subset possesses a range from approximately -.5 to -1.7 on social adjustment. Similar ranges exist on the other factors.

This analysis of within-style variation can be extended one more step. *A given factor score can be obtained through various combinations of the factor components.* Consider the social adjustment factor, which is composed of scores from the Self-Reliance, Sociability, Leadership, and Ease of Transition scales. As an illustration, the variability of scale scores within the social adjustment factor is reported in Figure 18. The graph shows how a specific social adjustment score (e.g., 1.0) can be obtained in various ways: 1 member of this style might be very low on sociability and ease of transition but moderate on leadership and self-reliance, whereas another member might be somewhat low on all four scales. Each member of the style will have a different combination of component scores. These are the types of

details that an advisor or counselor should examine in order to obtain the most precise understanding of a particular student.

Figure 18

**Box and Whisker Plots of the Components
 of the Social Adjustment Factor in Style 7
 1999 Study of Women Attending 4-Year Institutions**



In sum, a student's style classification is useful as the first step in understanding a CSI-A report: it provides information about the central thrust of the student's motivational tendencies. But it is necessary to refine that analysis through a subsequent examination of the student's scale scores. The latter indicate the individualistic details that enable one to understand how far the student may deviate from the style and in what ways she or he may deviate. These principles apply to all motivational styles, not merely to style seven.

In addition to requiring that a given style be amenable to a coherent theoretical explanation supported by a confirming set of validating data, the configural theory requires that each motivational style possess significant differences with the other styles. A brief examination of the two other high-performance styles provides such support. Like the women with style seven, those with style 11 have very high academic aptitude scores. But they appear to have a much happier family background and to have less interpersonal issues in their lives. Theoretically, one would infer that they are faced with a lower level of chronic distress, so that their motivation to achieve through the compensatory channel of intellectual activity is less intense. Nevertheless, the intrinsic gratifications of intellectual activity appear to have become an important source of gratification for them, and they apply themselves with some diligence. The combination of their talents and efforts produces an above average level of

academic success. Thus, these students possess some significant differences relative to those in style seven even though both groups also share some commonalities.

The women with style three differ somewhat more markedly from the other two high performance groups. Most importantly, their aptitude scores are significantly lower than the others, and their socioeconomic background appears to be much higher than that of style seven. Of the high performing students, they alone have a very strong negative attitude toward their institution. This central fact combined with their lower aptitude suggests that their motivational dynamics are markedly different than that of the other two high performance groups. They appear to be focused on (a) the status of their families and (b) their feeling of intellectual inadequacy compared to their parents. Neither style three nor style seven appears to have the balance and peace of mind that one finds in style 11. Contrasts of these three groups thus provide some basis for concluding that the present analysis has met the distinctiveness criterion regarding high performing styles.

Among the five motivational style associated with moderate academic performance, which are described in Table 30, there is again a striking degree of diversity. There *is no factor on which all of the styles are similar*. Thus, on social adjustment, two are high and one is low. On receptivity, one is high but three are low or very low. On academic competence, one is high and the rest are medium. This diversity continues on academic motivation: two are very high but one is low. On attraction to the institution, two are high but two others are low or very low. Finally, one is high on family support but two are very low.

It is interesting that one style (2) resembles the above compensatory group (style 3) in having a very unfavorable attitude toward the institution. But style two also has important differences from that earlier group. Most notably, they are (a) much more strongly motivated academically, (b) much less receptive to institutional assistance, (c) more inclined to actually leave their current institution (persistence = 64% compared to 78.5), (d) lower in academic aptitude, and (e) more likely to come from a family experiencing some difficulties. They thus appear to possess less aptitude and to be more tense and driven in their compensatory strivings than the women with style three.

Table 30. Integrative Summary of Findings Pertaining to the Intermediate Women’s Motivational Styles Four-year Institutions (1990 and 1999 Studies)

Women’s Motivational Style	Concurrent Empirical Findings, Interpretations, and Hypothesized Scripts
5. Very low family support, high receptivity, high social adjustment, high academic competence	<p>Concurrent Findings: Slightly high GPA (M = 2.78); high persistence (M = 82.1%); strong concordance between GPA and persistence; high involvement in both intellectual and socially assertive extracurricular activities; parental education slightly above average; somewhat low degree aspirations; high academic aptitude scores; perceives high school academic standards as high; perceives college academic standards as somewhat high; moderately high expectations of personal study time.</p> <p>Interpretation: The women with this motivational style appear to be bright, socially active, fairly well motivated academically, and receptive to support. But these favorable indications are offset somewhat by very low parental support and moderately low degree aspirations. Overall, they seem to possess good</p>

prospects for academic success and persistence, making them good candidates for institutional support (especially recognition, encouragement, and financial guidance).

Hypothesized Script: There's been a lot of conflict and worry over money in my family. This has given me some insecurities that don't seem to go away. But I've tried to deal with these problems by doing pretty well in school and getting involved in a lot of activities. I like to be on good terms with my teachers and to receive their help because it makes me feel better about the adult world. I also have a number of friends, and people tend to respect me. Although I sometimes get distracted by social activities, doing well in school is very important to me. Except for my financial problems, I feel I can manage the challenges of college fairly well.

2. Very low attraction to institution, very high academic motivation, low receptivity, high social adjustment

Concurrent Findings: Slightly high GPA ($M = 2.72$); slightly low persistence (64.0%); persistence is disproportionately low relative to GPA; high involvement in both intellectual and socially assertive extracurricular activities; highly educated parents; high degree aspirations; academic aptitude scores about average; perceives both high school and college as having high academic standards; high expectations of personal study time.

Interpretation: The women with this motivational style appear to have high aspirations and well developed social skills. There is a noticeable discrepancy between their parents' high level of education and their moderate sense of family support, suggesting some difficulties in their family life. Their strong rejection of their present institution (relative to other students) may stem from feeling frustrated at failing to gain admission to a more prestigious school or the absence of sufficient funds to pay the high tuition at a more expensive school. This emotional interpretation of their strong institutional rejection is supported by (a) their high apparent socioeconomic status in the context of moderate test scores, (b) the discordance between grades and persistence, and (c) their strong desire to leave despite their high academic motivation and favorable perception of their institution's academic standards. Overall, high status pressures in their families combined with their moderate academic aptitude may have made them somewhat externally directed, insecure about their status, and inclined to blame their environment when they feel inadequate. If an advisor or counselor can soothe these feelings, the student's prospects of success and persistence are good.

Hypothesized Script: My parents were very successful in school, and I admire them for that. But there have been a lot of tensions and conflict in the family. In school I've done pretty well, but I have to work hard. Sometimes I feel that I'm not as bright as my parents. This thought is very upsetting, and it motivates me to do the best I can because I've always felt that I belonged (or ought to belong) in the upper strata of society. I'm an intense person, and I don't like having other people interfere in my life. I was very disappointed when my test scores were not good enough to get me admitted into the school I wanted to attend. I felt that I was slipping down in status. As soon as I can I'd like to transfer to my preferred school so I'll feel more comfortable with myself and won't feel inferior to the people in my high school who went to more prestigious schools.

8. Very high academic motivation, very low receptivity, very low family support, high attraction to institution

Concurrent Findings: Slightly high GPA ($M = 2.67$); slightly high persistence (70.9%); strong concordance between GPA and persistence; moderately high involvement in intellectual extracurricular activities; very low involvement in socially assertive extracurricular activities; very low parental education; slightly low degree aspirations; moderate academic aptitude test scores; perceives her high school as having somewhat low academic standards; perceives her

college as having slightly high academic standards; high expectations of personal study time.

Interpretation: The women with this motivational style often come from low-income families and to be less outgoing socially than other students. Their very low receptivity to assistance in the context of moderate need suggests some defensiveness: they strongly dislike others interfering in their lives. Nevertheless, they are likely to appreciate financial guidance and assistance in light of their very low family support. But they have a strong desire to achieve. Their prospects are further enhanced by a positive attitude toward the institution. Their level of academic success closely matches their aptitude. Most of these students will graduate with moderate but quite acceptable grades.

Hypothesized Script: I feel uncomfortable around other people, and I don't like people putting pressure on me. My parents have had a very hard time in life, and they have had to struggle to make ends meet. By witnessing their difficulties I have come to appreciate the value of a good education, and I have an intense desire to get a college degree as a way of bettering myself. But I'm not sure that I have the ability that it takes. I appreciate my college because it has given me an opportunity to get ahead.

10. High attraction to institution, high family support, low academic motivation

Concurrent Findings: Moderate GPA (M = 2.62); very high persistence (M = 85.2%); persistence is disproportionately high relative to GPA; very low involvement in intellectual extracurricular activities; somewhat high involvement in socially assertive activities, especially athletics; fairly high parental education; somewhat low degree aspirations; moderate academic aptitude test scores; perceives her high school as having somewhat low academic standards; perceives her college as having moderate academic standards; somewhat low expectations of personal study time.

Interpretation: The women with this motivational style show a somewhat conflicted attitude toward their education. On the one hand, they express a favorable attitude toward the institution, a very high persistence rate, and average test scores. But they have a low interest in intellectual activities, low degree aspirations, low dedication to studying, and moderately low grades. It appears that they are trying to try to appease their parents' high educational standards while covertly or unconsciously rejecting them. Their personal development will probably be most facilitated by helping them to establish their own life goals so that they can emotionally own their educational pursuits.

Hypothesized Script: My parents have put a strong emphasis on education, but I'm just not a very brainy person. I prefer athletics and social or physical involvement with the world rather than thinking a lot. I like my college because it's respectable but not too demanding. I plan to hang in there and to try to make through all four years even though school is not really my thing.

9. Very low social adjustment, low receptivity, low attraction to institution

Concurrent Findings: Moderate GPA (M = 2.62); slightly low persistence (M = 69.5%); strong concordance between GPA and persistence; somewhat low involvement in extracurricular activities; moderately low parental education; very low degree aspirations; moderate academic test scores; perceives her high school and college as having somewhat low academic standards; very low expectations of personal study time.

Interpretation: The women with this motivational style appear to be very unhappy, introverted, and socially insecure. They have approached their institution with a negative attitude, and they are somewhat unreceptive to

assistance. Nevertheless, they achieve at a level that is roughly commensurate with their academic aptitude. Although they are probably difficult to approach, they may have one or two areas of selective receptiveness to assistance. Efforts to integrate them into their social environment and reduce their general negative outlook may be very beneficial to them, but it may be difficult to modify their general feelings of unhappiness. They will probably graduate with low but quite acceptable grades.

Hypothesized Script: I've always been a tense person who doesn't handle stress very well. I try to keep my life simple and to avoid upsetting situations. Although I do all right in school, I don't like studying and competitive pressures. I don't care too much for my college; it's just more of the same that I've had for twelve years. I guess I'm here because of society's demand that young people get a degree. I hope to get by and that's all.

Given the importance of reducing academic failure, the three motivational styles associated with low academic performance are of special interest (see Table 31). Perhaps the most salient pair of findings from these groups is that (a) all three groups report a low or very low sense of academic competence on the attitudinal scales and self-reported high school grades and (b) all three report having obtained very low academic aptitude scores. The obvious conclusion is that some degree of objective intellectual deficit is related to all of the low academic performance styles.

Table 31. Integrative Summary of Findings Pertaining to the Most Unfavorable Women's Motivational Styles Four-year Institutions (1990 and 1999 Studies)

Women's Motivational Style	Concurrent Empirical Findings, Interpretations, and Hypothesized Scripts
4. High receptivity, low academic competence, low family support	<p>Concurrent Findings: Slightly low GPA (M= 2.42); slightly high persistence (M = 74.5%); persistence is disproportionately high relative to GPA; low involvement in intellectual extracurricular activities; moderately high involvement in socially assertive extracurricular activities; moderately low parental education; moderately low degree aspirations; very low academic aptitude scores; perceives her high school as having low academic standards; perceives her college as having low academic standards; slightly low expectations of personal study.</p> <p>Interpretation: The women with this motivational style appear to feel very inadequate academically, and their low test scores suggest that their ability level is objectively low. Their sense of inadequacy seems to permeate their world-view, such that they may be inclined to attribute their academic problems to deficiencies in their high schools and to gain comfort from the perception of their college's academic standards as low. These women appear to need a considerable amount of academic, emotional, and financial support. Fortunately, they are receptive to such support. Their disproportionately high persistence is also a favorable indication. Many of the students in this group are likely to earn low but passing grades and to complete their degrees. Overall, they are very good candidates to receive institutional assistance</p>

Hypothesized Script: School has always been something of a struggle for me, and I've never been very interested in brainy activities. I prefer working directly with practical tasks. Sometimes I wonder if I'm going to be wasting my time at college. But I've seen the struggle my parents have had with just high school diplomas, and I plan to hang in there and do the best I can. Anything my teachers can do to help me will be appreciated.

1. Very low attraction to institution, low academic competence, high family support

Concurrent Findings: Very low GPA ($M = 2.36$); slightly low persistence (67.3%); strong concordance between GPA and persistence; very low involvement in intellectual extracurricular activity; medium involvement in socially assertive extracurricular activity (with emphasis on athletics); highly educated parents; low degree aspirations; very low academic aptitude scores; perceives her high school's academic standards as moderately low; perceives college academic standards as medium; very low expectations of personal study time.

Interpretation: The women with this motivational style appear to feel inadequate relative to their parents' educational achievements, and they may be rejecting intellectual aspiration as a way of protecting themselves from further stress in this area. Their rejection of the institution may reflect a subconscious rejection of all educational demands. Given that their test scores are generally close to average but their performance well below average, their personal development would probably be most facilitated by counseling aimed at helping them to accept themselves as they are and to gain a greater sense of ownership over the direction of their lives (rather than rebelling against their parents standards).

Hypothesized Script: My parents are well educated and they've done well in life. But I'm just not a brain. Intellectual activities have never interested me at all. I prefer to get involved in practical tasks, and I really enjoy athletics. I don't like my college because it places too much emphasis on classes and studying. I'm here because my parents have always expected me to go to college and because our society puts so much pressure on young people to get a degree. I wish I could just drop out, but I'd feel ashamed of myself if I did that. I'm planning to stick it out as long as I can.

6. Very low social adjustment, very low academic competence, high attraction to institution

Concurrent Findings: Slightly low GPA ($M = 2.31$); slightly low persistence ($M = 65.3\%$); strong concordance between GPA and persistence; very low involvement in both intellectual and socially assertive extracurricular activities; very low parental education; low degree aspirations; very low academic aptitude test scores; perceives both her high school and college as having low academic standards; low expectations for personal study time.

Interpretation: The women with this motivational style appear to be quite introverted and unsure of themselves. Their parents' low level of education has possibly deprived them of strong educational role models, and their low test scores suggest that their aptitude may be objectively low. They appear to have bonded somewhat strongly to the institution as a source of inspiration and support, and a majority of them are likely to earn passing grades and to graduate. Even though they are only average in receptivity, their high level of need and their attraction to the institution are favorable indications for institutional support. They are most likely to benefit from efforts to enhance their basic academic skills and to provide emotional support aimed at reducing their general feeling of inadequacy.

Hypothesized Script: I've always been a tense person who doesn't handle stress very well. I try to keep my life simple and to avoid upsetting situations.

For this reason, I tend to keep to myself a lot. When I'm with others, I tend to go along with whatever they want to do.

I don't like studying and competitive pressures. My parents didn't go to college and they're getting by. I feel fairly comfortable with my college because it doesn't seem to place too much emphasis on grades.

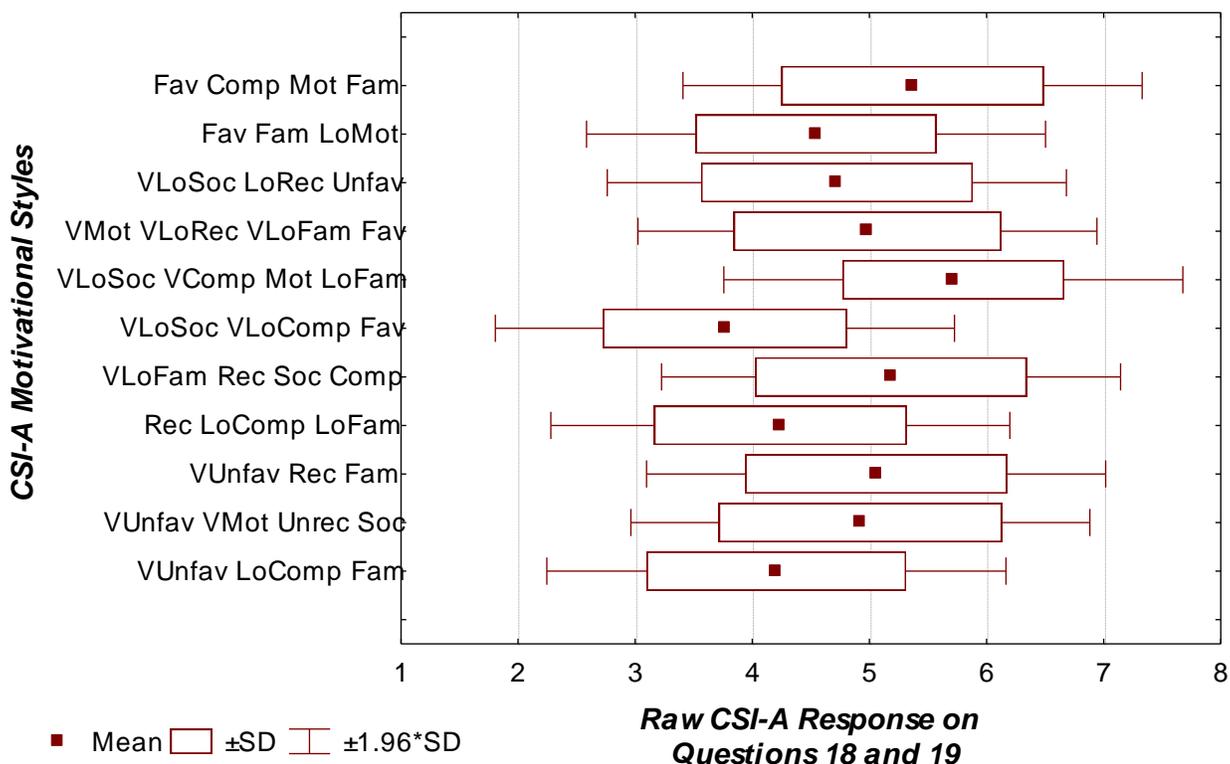
It is very important to recognize, however, that not all members of these low-performing styles actually have deficits in academic competence. As discussed earlier, *we must remember that each style is a family of somewhat similar but idiosyncratic individuals*. In the case of students possessing one of the less favorable motivational styles, it is especially important to examine the specific indications pertaining to academic competence. Even though the group as a whole will possess a low mean on this factor, some of these students will be high on some of its components. It is also advisable to examine the student's specific receptivity scales. A student who is low in overall receptivity might still be moderate or high on one of the specific receptivity scales.

The within-group variation on aptitude can be seen very clearly in Figure 19, which shows the box and whisker plots of the raw self-reported aptitude scores for the women in the four-year 1999 study.³ Examination of these plots shows considerable overlap in the distributions. For example, most members of the low-performing style six are below most of the members in the high-performing style seven. But *some* members of style six actually obtained higher aptitude scores than did *some* members of style seven. Thus, although very low *mean* academic aptitude is characteristic of all 3 of the low-performing women's styles (1, 4, and 6, counting up from the bottom), there is still considerable within-group variability even on this dimension.

³ Raw scores can range from 1 to 7. When a student reported both ACT and SAT scores, they were averaged.

Figure 19

Box and Whisker Plots of Self-Reported Aptitude Test Scores for Different CSI-A Motivational Styles
1999 Study of Women Attending 4-Year Institutions



These data again emphasize the importance of interpreting the motivational styles appropriately. When a student is categorized as having a given style, that categorization should be used only as a starting point in understanding the student. The categorization is essentially stating that the preponderant weight of all the evidence points toward a given general conclusion about the student, but it does not imply that the student will necessarily fit the style in all particulars. As the next step, it is necessary to examine the specific scale results to ascertain any aspects of the student’s report that do not fit the general profile of the style.

Men’s Motivational Styles

Style Definitions and Academic Performance

The men’s motivational styles are defined in Table 32. There are some very noticeable differences between the 3 most favorable men’s styles and the three most favorable women’s styles. The men’s style that was highest in all three studies was very high in competence, high in receptivity, and high in attitude toward the institution. There is no evidence of the low social adjustment that was found in the comparable women’s style. The third most favorable men’s style (5) was low in social adjustment, but not very low, and

there was no indication of low family support as was found in the most favorable women's style. Thus, high academic performance among men does not appear to be as closely associated with low social adjustment as it does with women. But this conclusion must be qualified by the fact that, overall, the men's GPAs are lower than the women's. Therefore, a comparison between the highest men's style and the highest women's style involve some subtle ambiguities.

Another interesting point is that there is a low-performance men's style (10) in which low academic competence is not a significant factor. There is no comparable style among the women.

Table 32. Cumulative Grade Point Average and CSI Motivational Styles for Men at Four-Year Institutions (1990 and 1999 Studies Combined)

Male Style #	Cumulative GPA	First Factor	Second Factor	Third Factor	Fourth Factor	Fifth Factor
2	2.97	Very high academic competence	High receptivity	High attraction to institution		
7	2.71	Very unreceptive	High attraction to institution	High academic competence	High family support	
5	2.67	Low social adjustment	High academic competence	Low attraction to institution	Low academic motivation	
11	2.63	Very low family support	High attraction to institution	High academic competence		
3	2.58	Very low attraction to institution	High academic motivation	High social adjustment	High receptivity	
4	2.53	Very low social adjustment	Low academic motivation	High receptivity		
12	2.49	Very low family support	Low receptivity	Low attraction to institution	High social adjustment	
1	2.33	High attraction to institution	High receptivity	Low academic competence	High academic motivation	
8	2.29	Low receptivity	Low attraction to institution	High family support	High social adjustment	
10	2.26	Very high social adjustment	Low family support	High receptivity	Low academic motivation	

6	2.20	Low academic competence	Low attraction to institution	Low social adjustment		
9	2.19	Very low academic competence	High attraction to institution	Low receptivity	Low academic motivation	High family support

Figure 20 shows the patterns of relationships between men’s motivational style and academic performance across the three studies. As was the case with women, the pattern for the 1990 study at four-year schools closely follows the pattern for the 1999 study at four-year schools. As reported in Table 33, the Pearson correlation between these two patterns is .93. This finding is further evidence that the styles identified through the methodology used in the present study have stable academic performance implications across samples from the same population. The figure also suggests that the men’s pattern at two-year schools diverged less sharply from the four-year patterns than were found among women. The only striking deviation among the two-year men was found with style 1 (Att Rec LoComp Mot), which had the lowest GPA of any of the groups in the study.

Figure 20

Table 33. Intercorrelation of Academic Performance-Attitudinal Pattern Relationships Among Three Male Samples

	1990 Study	1999 Study (2-year)	1999 Study (4-year)
1990 Study			
1999 Study (2-year)	0.83		
1999 Study (4-year)	0.93	0.80	

Coefficients in bold italics are significant at $p < .05$.

Institutional Persistence

The relationship between men's motivational styles and persistence at four-year schools is reported in Table 34.

Table 34. Persistence and CSI-A Motivational Style For Men at Four-Year Institutions

Male Cluster #	Percent Persisting	First Factor	Second Factor	Third Factor	Fourth Factor	Fifth Factor
2	89.7	Very high academic competence	High receptivity	High attraction to institution		
7	83.7	Very unreceptive	High attraction to institution	High academic competence	High family support	
4	83.3	Very low social adjustment	Low academic motivation	High receptivity		
1	78.7	High attraction to institution	High receptivity	Low academic competence	High academic motivation	
9	78.7	Very low academic competence	High attraction to institution	Low receptivity	Low academic motivation	High family support
3	76.8	Low attraction to institution	High academic motivation	High social adjustment	High receptivity	
11	73.9	Very low family support	High attraction to institution	High academic competence		
5	73.5	Low social adjustment	High academic competence	Low attraction to institution	Low academic motivation	
8	66.5	Very low receptivity	Low attraction to	High family support	High social adjustment	

institution					
6	62.7	Low academic competence	Low attraction to institution	Low social adjustment	
10	62.5	Very high social adjustment	Low family support	High receptivity	Low academic motivation
12	55.8	Very low family support	Low receptivity	Low attraction to institution	High social adjustment

Figure 21 shows the relationships between persistence and motivational styles in the three studies. Once again, there is a strong relationship ($r = .88$, as shown in Table 29) between the patterns at four-year institutions and a weaker relationship between the four-year pattern and the four-year patterns.

Figure 21

Table 35 reports the intercorrelations of the persistence rates for the different motivational styles in the 3 studies.

Table 35. Intercorrelation of Persistence-Attitudinal Pattern Relationships Among Three Male Samples

	1990 Study	1999 Study (2-yr)	1999 Study (4-yr)
1990 Study			
1999 Study (2-yr)	0.66		
1999 Study (4-yr)	0.88	0.40	

Coefficients in bold italics are significant at $p < .05$.

Relationship between Performance and Persistence

As reported in Table 36, there are three motivational styles that show large discrepancies between the group's GPA rank and its persistence rank. First, the men with style five appear to be somewhat under-persisting: their mean GPA rank is fairly high (3) but their persistence rank (8) is somewhat low, for a difference of -5. The men with this style appear to have some significant motivational problems. Later we will see that the group earned very high aptitude, yet they have low academic motivation, report low social adjustment, and report a low attraction to the institution. Because of their high ability, their departure is likely to be caused primarily by either a desire to transfer to a more prestigious institution or a general disenchantment with education.

Second, style 12 also seems to be under-persisting but at a much less favorable overall position than style five. The men in this group have a very negative view of their life situation, and they appear to be achieving well below their aptitude scores. Their under-achievement appears to be related to significant family problems.

Third, style nine is essentially the opposite of the previous two styles: their performance is the lowest of the 12 styles (rank = 12) but they persist at a fairly high level (rank = 5). We will see later that their mean aptitude scores are very low. Thus, they appear to be low-ability middle-income students who are quite discouraged but determined to persist as long as they can.

Table 36. Relationship between GPA and Persistence Rankings for Men's CSI-A Motivational Styles at Four-Year Institutions

Men's Style #	Cluster description	GPA Rank	Persistence Rank	Difference
2	Very high academic competence, high receptivity, high attraction to institution	1	1	0
7	Very unreceptive, high attraction to institution, high academic competence	2	2	0
5	Low social adjustment, high academic competence, low attraction to institution, and low academic motivation	3	8	-5
11	Very low family support, high attraction to institution, high academic competence	4	7	-3
3	Very low attraction to institution, high academic motivation, high social adjustment, high receptivity	5	6	-1
4	Very low social adjustment, low academic motivation, high receptivity	6	3	3
12	Very low family support, low receptivity, low attraction to institution, high social adjustment	7	12	-5
1	High attraction to institution, high receptivity, low academic competence, high academic motivation	8	4	4

8	Very low receptivity, low attraction to institution, high family support, high social adjustment	9	9	0
10	Very high social adjustment, low family support, high receptivity, low academic motivation	10	11	-1
6	Low academic competence, low attraction to institution, low social adjustment	11	10	1
9	Very low academic competence, high attraction to institution, low receptivity, low academic motivation, high family support	12	5	7

Extracurricular Activity

Tables 37 and 38 report ANOVA findings on the relationship between men’s motivational styles and their extracurricular activities. The specific results from these analysis will be discussed in the summary tables at the end of the section.

Table 37. Relationship between Men’s Motivational Style and Extracurricular Activities at Four-year Institutions (1999 Study)

Male Motivational Style	Extracurricular Activity						
	Athletics	Fine Arts	Leadership	Group Membership	Speech	Research	Writing
1. High attraction to institution, high receptivity, low academic competence, high academic motivation				Low*	Low		
2. Very high academic competence, high receptivity, high attraction to institution			High**	High**	High	High*	
3. Very low attraction to institution, high academic motivation, high social adjustment, high receptivity		High	High*	High**	High*		
4. Very low social adjustment, low academic motivation, high receptivity			Low	High Low*			
5. Very low social adjustment, high academic competence, low attraction to institution, low academic motivation	Low		Low*	High* Low			Low
6. Low academic competence, low		Low*	Low*	Low**	Low*	Low	Low

attraction to institution, low social adjustment						
7. Very low receptivity, high attraction to institution, high academic competence, high family support	High*	High	High*	High*	Low	
8. Very low receptivity, low attraction to institution, high family support, high social adjustment			Low	Low*		
9. Very low academic competence, high attraction to institution, low receptivity, low academic motivation, high family support	High		Low*	Low**	Low	Low
10. Very low social adjustment, low family support, high receptivity, low academic motivation	High			High*	Low	
11. Very low family support, high attraction to institution, high academic competence		High	Low*	High**		High*
12. Very low family support, low receptivity, low attraction to institution, high social adjustment	Low*	High	Low*	High*	Low	

* Indicates a comparison involving 2 to 4 other groups. ** Indicates a comparison involving 5 or more other groups.

Table 38. Relationship between Men's Motivational Style and Extracurricular Activity Factors Four-Year Institutions

Male Motivational Style	Intellectual Factor		Social Assertion Factor	
	1990 Study	1999 Study	1990 Study	1999 Study
1. High attraction to institution, high receptivity, low academic competence, high academic motivation	Low	Low*		
2. Very high academic competence, high receptivity, high attraction to institution	High**	High**	High*	High*
3. Very low attraction to institution, high academic motivation, high social adjustment, high receptivity	High* Low	High**	High	High
4. Very low social adjustment, low academic motivation, high receptivity	Low**	Low*	Low	High
5. Very low social adjustment, high academic competence, low attraction to institution, low academic motivation	High* Low	High Low*		Low*
6. Low academic competence, low attraction to institution, low social adjustment	Low**	Low**	Low*	Low*

7. Very low receptivity, high attraction to institution, high academic competence, high family support	High Low	High* Low		High*
8. Very low receptivity, low attraction to institution, high family support, high social adjustment	Low	Low**		
9. Very low academic competence, high attraction to institution, low receptivity, low academic motivation, high family support	Low	Low**	Low	
10. Very low social adjustment, low family support, high receptivity, low academic motivation	High Low	High* Low	High	High*
11. Very low family support, high attraction to institution, high academic competence	High Low	High** Low	Low	
12. Very low family support, low receptivity, low attraction to institution, high social adjustment	High	High*		Low**

* Indicates a comparison involving 2 to 4 other groups. ** Indicates a comparison involving 5 or more other groups.

Miscellaneous

Table 39 reports ANOVA findings on the relationship between men's motivational style and parent education, degree aspirations, and self-reported aptitude scores. Similarly, Table 40 reports ANOVA findings on the relationship between men's motivational style and their perceived high school academic standards, their perceived college academic standards, and their expectations of personal weekly study hours. Again, the specific findings will be discussed in relation to the summary tables at the end of the section.

Table 39. Relationship between Men’s Motivational Style and Parental Education, Degree Aspiration, and Aptitude Scores Four-Year Institutions

Male Motivational Style	Parental Education		Degree Aspiration		Self-Reported Aptitude Scores (ACT or SAT)	
	1990 Study	1999 Study	1990 Study	1999 Study	1990 Study	1999 Study
1. High attraction to institution, high receptivity, low academic competence, high academic motivation	Low*	Low*	Low	High Low	Low**	Low**
2. Very high academic competence, high receptivity, high attraction to institution	High**	High*	High**	High**	High**	High**
3. Very low attraction to institution, high academic motivation, high social adjustment, high receptivity	High*	High*	High**	High*	High* Low**	High* Low
4. Very low social adjustment, low academic motivation, high receptivity	Low		Low**	High Low*	Low**	High* Low**
5. Very low social adjustment, high academic competence, low attraction to institution, low academic motivation	High	High	High* Low	High* Low	High**	High**
6. Low academic competence, low attraction to institution, low social adjustment	Low	Low*	Low**	Low**	Low**	Low**
7. Very low receptivity, high attraction to institution, high academic competence, high family support		High*	High Low*	Low*	High**	High**
8. Very low receptivity, low attraction to institution, high family support, high social adjustment	High*		Low*	Low**	High Low**	High* Low**
9. Very low academic competence, high attraction to institution, low receptivity, low academic motivation, high family support	Low		Low**	Low**	Low**	Low**
10. Very low social adjustment, low family support, high receptivity, low academic motivation		Low	High*	High*	High* Low**	High* Low**
11. Very low family support,	Low*	Low*	High	High*	High**	High**

high attraction to institution, high academic competence		Low			
12. Very low family support, low receptivity, low attraction to institution, high social adjustment	Low	High*	High Low	High**	High**

Table 40 reports ANOVA findings on the relationship between men’s motivational style and their perceived high school academic standards, their perceived college academic standards, and their expectations of personal weekly study hours. Again, these data will be discussed in relation to the summary tables at the end of the section.

Table 40. Relationship between Men’s Motivational Style and Perceived High School Academic Standards, Perceived College Academic Standards, and Expected Hours of Study						
Four-year Institutions						
Male Motivational Style	Perceived High School Academic Standards		Perceived College Academic Standards (high is “just right”, low is “too high”)		Expected Hours of Study	
	1990 Study	1999 Study	1990 Study	1999 Study	1990 Study	1999 Study
1. High attraction to institution, high receptivity, low academic competence, high academic motivation	Low*	High			High*	High**
2. Very high academic competence, high receptivity, high attraction to institution	High**	High*	High*	High*	High**	High**
3. Very low attraction to institution, high academic motivation, high social adjustment, high receptivity	High* Low	High*		High	High*	High**
4. Very low social adjustment, low academic motivation, high receptivity	Low*	Low*	Low*	Low*	Low	Low*
5. Very low social adjustment, high academic competence, low attraction to institution, low academic motivation	High** Low	High			Low	Low*
6. Low academic competence, low attraction to institution, low social adjustment	Low**	Low**	Low*	Low**	Low*	Low*
7. Very low receptivity, high attraction to institution, high academic competence, high	High** Low	High*	High*	High*	High* Low	Low*

family support						
8. Very low receptivity, low attraction to institution, high family support, high social adjustment	High* Low			High	Low*	Low*
9. Very low academic competence, high attraction to institution, low receptivity, low academic motivation, high family support	Low**	Low*			Low*	Low*
10. Very low social adjustment, low family support, high receptivity, low academic motivation	Low*			Low*	Low	Low*
11. Very low family support, high attraction to institution, high academic competence	Low	High		High	Low	Low*
12. Very low family support, low receptivity, low attraction to institution, high social adjustment	Low	Low*		High	Low	Low*

Integrative Summary

One of the interesting contrasts between the styles of the two genders is that the women earned higher freshman GPAs but reported lower test scores than the men (see Table 12 above). To facilitate comparability across the genders, the descriptions of GPA (e.g., High) are based on the same convention across the genders (no other variable was treated in this way). As a result, none of the men’s styles is described as Very High on GPA. It is important to keep this fact in mind because most of the men’s styles with the highest GPA would only be classified as intermediate if they were assessed by the women’s standards.

In examining the four men’s styles with the highest freshman GPAs (see Table 41), there is only one (style 2) that is composed of high achieving students. These men appear to be quite high in both intellectual effectiveness and emotional balance. They feel positively toward their institution, they are receptive, and they have a history of high involvement in extracurricular activities. Clearly these men are significant assets to their institutions.

The other three men’s styles with the highest GPAs each present one or more problems. Men with style seven appear to have low academic motivation relative to both their very high self-rated academic competence and their very high test scores. They could benefit from institutional efforts to enhance their performance, but they are very unreceptive to assistance. Like the highest performing women’s group (style 7), men with style five report very low social adjustment, but unlike the women, they have low academic motivation and low attraction to the institution. There is no women’s group that is comparable. Finally, the men with style 11 are also very high in aptitude but somewhat indifferent to achievement and very low in family support.

Table 41. Integrative Summary of Findings Pertaining to the Most Favorable Men's Motivational Styles

Four-year Institutions (1990 and 1999 Studies)

Men's Motivational Style	Concurrent Empirical Findings, Interpretations, and Hypothesized Scripts
2. Very high academic competence, high receptivity, high attraction to institution	<p>Concurrent Findings: High GPA (M = 2.97); very high persistence (M = 89.7%); very strong concordance between GPA and persistence; very high involvement in intellectual extracurricular activities, and somewhat high involvement in socially assertive extracurricular activities; very high parental education; very high degree aspirations; very high academic aptitude test scores; perceives both his high school and college as having high academic standards; very high expectations for personal study time.</p> <p>Interpretation: The men with this motivational style are strongly inclined to take a very positive attitude toward academic endeavors and their broader social world. They are very bright individuals with a healthy balance in their priorities. Even though they, are receptive, their high achievement and persistence suggest that most of them do not need intensive institutional support. They should be encouraged to participate in honors programs, to become involved in directed study projects, and to give serious consideration to the pursuit of a graduate degree. They should be urged to further develop their leadership skills by taking the initiative in student activities. They are likely to make significant extracurricular contributions to their institution.</p> <p>Hypothesized Script: My parents are well educated, and they've put a lot of stress on education. I like school and do well. I feel comfortable at my present school; it's going to challenge me about as much as I want to be challenged. I'm thinking of going on to graduate school after I finish my bachelor's degree. I don't expect any problems to develop, but if they do I'll be receptive to help from my school. I'm looking forward to campus life and may join some groups.</p>
7. Very low receptivity, high attraction to institution, high academic competence, high family support	<p>Concurrent Findings: Slightly high GPA (M = 2.71); high persistence (M = 83.7%); very strong concordance between GPA and persistence; a moderate involvement in intellectual extracurricular activities; a mildly high involvement in socially assertive extracurricular activities; slightly high parental education; slightly low degree aspirations; very high academic aptitude test scores; perceives his high school and college as having high academic standards; moderate expectations of personal study time.</p> <p>Interpretation: The men with this motivational style are very bright and persistent in their studies, but their academic motivation is a little low relative to their high level of talent. Although their achievement is solid, they appear to be underachieving. This impression is reinforced by their modest degree aspirations. Their very low receptivity is a major consideration in working with them. They appear to resent outside assistance, either because they feel they do not need it or because it interferes with their sense of independence. If the student has any specific areas of need and receptivity, these should be pursued but in a cautious manner.</p> <p>Hypothesized Script: My parents have a fairly good education but it's nothing special. I've done well in school because it's easy for me, but I don't particularly enjoy it. My parents are strongly behind me, and that bolsters my motivation. My study skills are very good, and I don't need any help with them. In general, I</p>

feel that I can solve my own problems.

5. Very low social adjustment, high academic competence, low attraction to institution, low academic motivation

Concurrent Findings: Slightly high GPA ($M = 2.67$); moderate persistence ($M = 73.5\%$); persistence is disproportionately low relative to GPA; a moderate involvement in intellectual extracurricular activities; a mildly low involvement in socially assertive extracurricular activities; moderately high parental education; slightly high degree aspirations; very high academic aptitude test scores; perceives his high school as having high academic standards; perceives his college as having moderate academic standards; low expectations of personal study time.

Interpretation: The men with this motivational style tend to be very bright but academically under-motivated and socially reserved. Their tendency to reject the institution is likely to stem from either a desire to transfer to a more prestigious institution or a general disenchantment with education (which they may have found unchallenging or ungratifying). Efforts to help these students should focus on reducing their negative attitudes toward the school, heightening their academic motivation, and facilitating their sense of social integration.

Hypothesized Script: My parents have a fairly good education but it's nothing special. I've done well in school because it's easy for me, but I don't particularly enjoy it. I've always been a tense person, and the stress of studying and taking tests sometimes gets to me. My parents and I don't get along very well, and I feel I have to make my own decisions and earn the extra money I need to go to school. I would prefer to attend a better school, but I can't afford it (or couldn't get in because of high school grades). There's a part of me that wants to finish college, but I can't say I'm really enthusiastic.

11. Very low family support, high attraction to institution, high academic competence

Concurrent Findings: Moderate GPA ($M = 2.63$); moderate persistence ($M = 73.9\%$); persistence is disproportionately low relative to GPA, but only to a slight degree; a slightly high involvement in intellectual extracurricular activities; a mildly low involvement in socially assertive extracurricular activities; low parental education; slightly high degree aspirations; very high academic aptitude test scores; perceives his high school and college as having moderate academic standards; low expectations of personal study time.

Interpretation: The men with this motivational style are generally talented under-achievers, often from low- to moderate-income families. In addition to their high aptitude, the most positive indications are (a) their high attraction to their institution and (b) their moderate receptivity. They are often somewhat open to help. Thus, these are students who are prime candidates for intervention focused on providing emotional support and financial assistance. To reinforce the students' pre-existing bonds to the institution, the advisor should attempt to establish her- or himself as a firm base of support in his new environment. These students should also be encouraged to get to know their professors, to seek opportunities for directed study, and to give serious consideration to aiming at a graduate degree.

Hypothesized Script: My parents don't have a very good education, and we don't get along very well. I've done well in school because it's easy for me, and sometimes I get interested in a certain subject. But it's not the most important part of my life. I'm going to have to work in order to get through school, and I don't expect to have a lot of time for studying. I like my school because it fits my needs.

As was found with the women, the men's styles associated with intermediate levels of performance are quite diverse (see Table 42). In style three, the most distinctive characteristic is very low attraction to the institution. In style four it is very low social adjustment, and in style 12 it is very low family support. Thus, each intermediate style possess a major weakness that counterbalances its strengths.

Table 42. Integrative Summary of Findings Pertaining to the Intermediate Men's Motivational Styles
Four-year Institutions (1990 and 1999 Studies)

Men's Motivational Style	Concurrent Empirical Findings, Interpretations, and Hypothesized Scripts
3. Very low attraction to institution, high academic motivation, high social adjustment, high receptivity	<p>Concurrent Findings: Moderate GPA (M = 2.58); slightly high persistence (M = 76.8%); moderate concordance between persistence and GPA; a high involvement in both intellectual and socially assertive extracurricular activities; high parental education; very high degree aspirations; moderate academic aptitude test scores; perceives his high school as having high academic standards; perceives his college as having moderate academic standards; high expectations of personal study time.</p> <p>Interpretation: The men with this motivational style tend to come from upper-middle class families, and they are often extraverted and very ambitious. They may be somewhat frustrated by their moderate level of academic aptitude. This frustration may underlie their strong rejection of the institution, perceiving it as lacking the status they seek. Their receptivity to assistance is a favorable indication, possibly providing support staff with an opportunity to help the student accept his ability level and to pursue realistic life goals. A central element of such realism would be to help him accept his present institution as a fruitful ally in his strivings for success.</p> <p>Hypothesized Script: Life is a great challenge, and the people who get ahead are the people who give it their all. I'm an ambitious person, and I tend to get very involved in a lot of activities. I feel that my present school is a bit beneath me. I want to associate with other ambitious people and to make a lot of contacts that will be valuable in my career, so I may transfer. Although I've done well enough in school, I have to put in a lot of time and effort. So I welcome any help from my teachers that I can get.</p>
4. Very low social adjustment, low academic motivation, high receptivity	<p>Concurrent Findings: Moderate GPA (M = 2.53); high persistence (M = 83.3%); persistence is mildly disproportionately high relative to GPA; a low involvement in intellectual extracurricular activities; a moderate involvement in socially assertive extracurricular activities; moderate parental education; low degree aspirations; low academic aptitude test scores; perceives both his high school and college as having low academic standards; low expectations of personal study time.</p> <p>Interpretation: The students with this motivational style appear to be very introverted and socially insecure, and they seem to possess a somewhat negative attitude toward education. To some degree, their rejection of their school may reflect an objectively low level of academic aptitude. But their negative attitude has a defensiveness that seems to go beyond what might be expected from their aptitude level, and their actual academic performance is</p>

better than one might expect. In addition to their often solid performance, the most favorable indications for these students are (a) their high receptivity to assistance and (b) their relatively high level of persistence. They are prime candidates for an intervention focused on developing their academic skills and reducing their feelings of social inadequacy.

Hypothesized Script: I've always been a tense person, and the stresses of dealing with other people and trying to get good grades often get to me. I haven't done particularly well in school, and I'm not very enthusiastic about college. I plan to do what I think is necessary but not to get really involved. If someone could help me be a better student or deal more effectively with my tensions, I would welcome that.

12. Very low family support, low receptivity, low attraction to institution, high social adjustment

Concurrent Findings: Slightly low GPA (M = 2.49); very low persistence (M = 55.8%); persistence is quite disproportionately low relative to GPA; a high involvement in intellectual extracurricular activities; a moderately low involvement in socially assertive extracurricular activities; moderate parental education; slightly high degree aspirations; very high academic aptitude test scores; perceives his high school as having low academic standards; perceives his college as having moderate academic standards; low expectations of personal study time.

Interpretation: The men with this motivational style appear to be quite talented academically but to come from families that not fostered their academic motivation. Their distress is likely to be the cause of their rejection of the institution and their low receptivity; perhaps they resent not having the financial resources to attend a more prestigious school. They also appear to have learned to reject outside pressures. The principal favorable indication is their fairly good social adjustment and their acceptable academic performance. They are likely to benefit greatly from the development of good working relationships with their professors and from participation in directed study and extracurricular activities that enable them to find a channel for personal development.

Hypothesized Script: My parents and I don't get along very well, and we often don't see eye-to-eye on my education. I don't like people interfering in my life. School has always come easily for me, and I don't plan on putting in a lot of time studying. I'll probably spend quite a bit of time hanging out with friends and just enjoying life. My present school is acceptable, but I'd really like to attend one of the big league schools where there's more excitement. If I can swing it, I may transfer in a semester or two.

As reported in Table 43, there are 5 men's styles associated with low academic performance. Three of these are characterized by low (styles 1 and 6) or very low (style 9) scores on the academic competence factor. But two of the low-performing styles (style 8 and 10) are associated with aptitude scores that are close to (only slightly below) the average for all men. The men in these groups thus appear to be underachieving. Of these, the men with style 10 appear to be the most promising candidates for institutional support. Although low on several important indicators, they appear to be receptive to help.

The group with the lowest academic performance is style nine. These men appear to have a history of fairly severe academic difficulty by the standards of the rest of the college population, and they appear to be discouraged. Given that the average member of this group earns passing grades (GPA = 2.29), most are capable of completing a degree. Therefore, they are prime candidates for institutional assistance—except that many of them are low in

receptivity. This tendency is most likely a defensive reaction to their discouragement. An appropriate approach by staff may be able to reduce their discouragement.

**Table 43. Integrative Summary of Findings Pertaining to the Most Unfavorable Men's Motivational Styles
 Four-Year Institutions (1990 and 1999 Studies)**

Men's Motivational Style	Concurrent Empirical Findings, Interpretations, and Hypothesized Scripts
1. High attraction to institution, high receptivity, low academic competence, high academic motivation	<p>Concurrent Findings: Somewhat low GPA (M = 2.33); slightly high persistence (M = 78.7%); persistence is somewhat disproportionately high relative to GPA; a low involvement in intellectual extracurricular activities; a moderate involvement in socially assertive extracurricular activities; low parental education; moderate degree aspirations; very low academic aptitude test scores; perceives his high school as having slightly low academic standards; perceives his college as having moderate academic standards; very high expectations of personal study time.</p> <p>Interpretation: The men with this motivational style are very low in academic aptitude but highly motivated to succeed. They appear to have bonded to the institution as a source of support in their struggle to achieve, and they are receptive to help. Thus, they are prime candidates for institutional intervention, with a focus on the further development of basic academic skills. They are likely to appreciate the help they receive, and it will further strengthen their strong desire to persist.</p> <p>Hypothesized Script: My parents have always stressed the importance of a good education, and I can see the wisdom of their advice. School has always been difficult for me, and I have to put in a lot of study time in order to make acceptable grades. But somehow I'm going to get a college education. That's why I like my college; they don't have unreasonable expectations here, and they've been helpful to me. Anything my teachers can do to help me is greatly appreciated.</p>
8. Very low receptivity, low attraction to institution, high family support, high social adjustment	<p>Concurrent Findings: Somewhat low GPA (M = 2.29); very low persistence (M = 66.5%); moderately strong concordance between persistence and GPA; a low involvement in both intellectual and socially assertive extracurricular activities; slightly high parental education; somewhat low degree aspirations; slightly low academic aptitude test scores; perceives both his high school and college as having moderate academic standards; low expectations of personal study time.</p> <p>Interpretation: The men with this motivational style appear to be somewhat conflicted in their social life: they perceive themselves to be assertive and socially involved, but they did not participate very much in extracurricular activities. Although their test scores are just slightly below average, their grades and persistence are very low. These facts also suggest a lack of direction. The impression that they are struggling to clarify their attitudes and goals is further supported by their very low receptivity to assistance. They may be attempting to protect their sense of self through an excessive resistance to outside influence. Their rejection of their institution further supports this conclusion, as it suggests a generalized negativity in their attitudes toward their environment. These are young men who could benefit significantly from counseling and other support</p>

services, but they are likely to resist such help. Because of the high need, however, some efforts in this direction are worth attempting.

Hypothesized Script: I get easily frustrated when things don't go the way I want them to, and I get down on myself when I get bad grades. I don't like people giving me advice or trying to run my life because it makes me feel bad about myself. School in general makes me feel tense and irritable—there's just too much pressure. My parents support my education and are urging me to finish a degree, but I don't know how long I will be able to put up with all the nonsense of studying for tests and worrying about everything all the time.

10. Very low social adjustment, low family support, high receptivity, low academic motivation

Concurrent Findings: Somewhat low GPA ($M = 2.26$); slightly low persistence ($M = 62.5\%$); moderately strong concordance between persistence and GPA; moderate involvement in intellectual extracurricular activities; high involvement in socially assertive extracurricular activities; moderate parental education; high degree aspirations; slightly low academic aptitude test scores; perceives both his high school and college as having slightly low academic standards; low expectations of personal study time.

Interpretation: The men with this motivational style seem to be somewhat conflicted over their education and social adjustment. Educationally, they have high degree aspirations but low academic motivation and slightly low test scores. This pattern suggests that they would like to pursue a prestigious career path but feel inadequate and discouraged. Socially, they have a record of high involvement in socially assertive extracurricular activities, but they seem to feel very insecure socially and to lack family support. Overall, these students seem to be prime candidates for an intervention focused on (a) providing general emotional support and academic encouragement and (b) helping them discover and commit to a suitable career goal. Their high receptivity supports this recommendation.

Hypothesized Script: I'm a sensitive person, and interacting with other people is difficult for me. But I force myself to get involved. Going to college is going to be difficult because my parents can't give me a lot of help, and I need a lot of time to study. For these reasons, I often feel discouraged about school. But I really want to get a degree and move up in the world. I welcome any help I can get.

6. Low academic competence, low attraction to institution, low social adjustment

Concurrent Findings: Very low GPA ($M = 2.20$); slightly low persistence ($M = 62.7\%$); moderately strong concordance between persistence and GPA; very low involvement in intellectual extracurricular activities; low involvement in socially assertive extracurricular activities; low parental education; very low degree aspirations; very low academic aptitude test scores; perceives both his high school and college as having very low academic standards.

Interpretation: The men with this motivational style appear to feel very weak academically and to have difficulty asserting themselves socially. Many appear to come from low-income families. Their very low test scores suggest that objectively they are academically weak. Their low attraction to the institution probably suggests that they are contemplating transferring to a less demanding institution. Overall, these students seem to be good candidates for an intervention focused on (a) providing general emotional support and academic encouragement and (b) helping them discover and commit to a suitable career goal. Although their receptivity to help is only moderate, many of these students will probably respond to intervention efforts with some degree of cooperation. In working with these students, staff members need to keep their apparent fragile

self-esteem at the forefront of their thinking.

Hypothesized Script: School has always been very hard for me, and sometimes I wonder why I'm even going to college. I don't feel that I really belong at my school. Interacting with others is also difficult for me because I have sensitive feelings, so I often prefer to do things by myself. If someone has ideas that can help me, I'm willing to listen. But I don't think anything is really going to work out for me here.

9. Very low academic competence, high attraction to institution, low receptivity, low academic motivation, high family support

Concurrent Findings: Very low GPA ($M = 2.19$); slightly high persistence ($M = 78.7\%$); persistence is quite disproportionately high relative to GPA; low involvement in intellectual extracurricular activities; slightly low involvement in socially assertive extracurricular activities; moderate parental education; very low degree aspirations; very low academic aptitude test scores; perceives his high school as having very low academic standards; perceives his college as having moderate academic standards; low expectations of personal study time.

Interpretation: The men with this motivational style are very weak academically and recognize their weaknesses. As a result, they feel a considerable amount of discouragement, which appears to have undermined their motivation. Their low receptivity suggests that they are defensive about their inadequacies. Nevertheless, they have two major favorable indications: (a) they are strongly attracted to the institution and (b) they have a high level of family support. Interventions with these students should provide emotional support and emphasize the importance of effort in academic success. Any areas of selective receptivity to assistance should be given a high priority.

Hypothesized Script: School has always been very difficult for me, and I'm not optimistic about actually finishing a degree. But my parents are encouraging me and helping to pay my way, so I'm going to give it a try. The people at my school have been helpful, and I like the overall atmosphere. They don't seem to put too much emphasis on grades. But learning is such a drag that I don't expect to spend much time studying. I find it humiliating to be given special help, so I don't want to go into any special programs for weaker students.

Overall, the substantial diversity among the low-performing men's styles further supports the configural premises of the study. If motivational variables combine in a simple linear manner, then each level of performance as one moves from highest to lowest would be characterized as having an increasing quantity of the most unfavorable tendencies. The pattern might appear as follows:

- A. Most favorable style = unfavorable trait 1 at 1.0 + unfavorable trait 2 at 1.0 + unfavorable trait 3 at 1.0;
- B. intermediate style = unfavorable trait 1 at 2.0 + unfavorable trait 2 at 2.0 + unfavorable trait 3 at 2.0
- C. most unfavorable style = unfavorable trait 1 at 3.0 + unfavorable trait 2 at 3.0 + unfavorable trait 3 at 3.0.

Instead of this pattern, the present study has found a pattern in which the unfavorable traits shift back and forth as they combine with each other in different ways. There is a general trend for academic competence and academic aptitude to decrease as GPA decreases, but the trend is by no means linear (e.g., style 12 is very high in aptitude but intermediate in GPA). This support for the configural premise among the men buttresses the similar evidence found among women. Together, these converging lines of support strongly suggest that further research on a configural theory of college student outcomes may be very fruitful.

Individual Institution Research Studies

Thus far, the discussions in this guide have focused on quantitative research findings that support the development of the College Student Inventory and how the three versions (Forms A, B, and C) have emerged with strong empirical evidence. It is equally important to consider qualitative findings, as well as findings that integrate the quantitative and qualitative methods of research, to more fully define the value of this powerful tool. To that end, you are encouraged to visit the Noel-Levitz website and review the client case studies that add tremendous insights into the conceptual underpinnings of the CSI. In addition, the MyNoelLevitz client community Website provides opportunities to review the results of multiple campus research studies in the Retention Success Journal, as well as the annotated bibliography on early intervention.

<https://www.noellevitz.com/student-retention-solutions/retention-management-system-plus/clients-and-case-studies>

<https://www.noellevitz.com/mynoelevitz/clientcommunities/retention-management-system-plus/welcome/retention-success-journal>

In Summary

A considerable body of empirical data supports the CSI's reliability and validity. Its reliability is solid when assessed in terms of both homogeneity and stability. Its validity is also very solid. The content of its items closely parallels the motivational constructs that it attempts to measure, and these constructs are closely related to the established principles of academic achievement and retention at the post-secondary level. Research on the CSI's concurrent validity has shown that it relates well with other indicators of the variables it measures. Its results are consistent with general theory, thus establishing its construct validity. The CSI's predictive validity is very solid when assessed in terms of students' first year GPA. Predicting persistence is a more difficult task because of the complexity of the social and academic factors involved. In addition, the various subtypes of leaving must be distinguished from one another in order to gain a clearer understanding of the CSI's effectiveness in this area. This has not been feasible in the research conducted to date. But the relationship between the CSI's scales and persistence are in the directions expected even without distinguishing among the different types of leaving.

Thus, the CSI appears to be a very valuable instrument for helping college personnel identify the needs of entering students and target those at-risk for appropriate intervention early in the first term.

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