SAIR and NCAIR Best Paper: Academic Confidence and the Impact of a Living-Learning Community on Persistence

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NOTE:

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ABSTRACT

Academic confidence cultivated within the context of learning communities may be an important key to student success. This study examined the structural relationships of four constructs on academic performance and persistence for summer bridge learning community (SBLC) and non-SBLC members. Constructs included (1) student background, (2) academic confidence, (3) desire to finish college, and (4) intent to transfer. SBLC participants ended their freshman year with significantly higher GPAs and returned the following year at greater rates than non-SBLC members. Even though it was found that none of the constructs directly influenced persistence for either group, a significant direct effect of academic confidence on academic performance was found for SBLC members. This study demonstrates clearly that in spite of budgetary constraints, learning community models work; students in SBLCs generally show more positive outcomes (i.e., first year GPA and persistence to year two) than non-SBLC students. The statistical power of structural equation modeling is demonstrated and policy implications are discussed.

Keywords: Learning communities, summer bridge, academic confidence, persistence

Strong academic confidence informed through a learning community experience may be an important component of student motivation to complete college. Tinto (1998a) has emphasized that engagement matters and learning communities with their shared learning experiences may serve to bridge the academic-social divide that typically plagues student life. If true then perhaps learning communities with their emphasis on bolstering academic confidence through small group interaction and other forms of engagement merit closer investigation. But how effective are learning communities in addressing the academic needs of the plethora of underprepared students entering higher education? As institutions experience exacerbated accountability pressure as a result of deeply constrained budgets, evidence of cost effectiveness becomes mandatory. The present study attempts to provide such evidence in its investigation of a learning community at a medium sized, public Historically Black College or University (HBCU) in the Southeast.

Neither the problem of student dropout behavior nor the antidote of learning communities (LCs) is new to the higher education community. The educator's conundrum regarding why students stay in or drop out of college continues. In a large study of 529,047 freshmen who entered one of 306 Division I colleges as freshmen in 1990-91, just over half (56%) graduated after six years (Ethier, 1997). A dozen years later in 2009, Bowen and colleagues found the same thing (2009). They examined graduation rates at 21 flagship public universities and four statewide systems of public higher education. Students from the entering class of 1999 were assessed from entry to graduation to transfer to withdrawal. These researchers concluded that less than sixty percent of students entering four-year colleges in America are graduating after six years. Such data are in sync with National Center for Education Statistics (2005) findings as well Osequera's (2006) study of degree completion rates. In spite of what appears to be a

pervasive graduation crisis, steady enrollment in higher education is evidence that the American dream of obtaining a college degree is alive and well. In order to balance such access with enhanced retention and student success, colleges and universities are challenged with understanding the process and dynamics of educational attainment. This is especially true given the difficulty of accurately measuring student goals, plans, expectations, and motivations (Allen and Nora, 1995; Brower, 1992). While it is acknowledged that not all first-time, full-time freshmen are motivated to complete college, and many who are motivated lack the academic preparation, the financial wherewithal, or the bureaucratic skill to negotiate registration, advisement, financial aid and the like. In order to intervene more effectively on behalf of students who are motivated to complete college, it is important to better understand the wide array of motivational factors that may exist and their role in influencing student adjustment to college. Learning communities may be ideally positioned to provide such insight.

Learning communities typically consist of a set of linked courses, usually exploring a common theme. Students often take three or more classes together, thus forming a "community of learners." The goal of course is to prepare such students for the rigors of college. The common ingredient of shared knowledge (of subject matter) and shared knowing (of each other) is what makes LCs unique (Tinto, 1998b). Thus, most LCs are characterized by supportive peer groups, shared learning-studying experiences, and engagement. In combination, these have been shown to result in greater persistence. Research shows that LCs have statistically significant positive net effects on student persistence into the second semester (Tinto and Russo, 1994) and into the second year (Strassen, 2003; Tinto, 1997). Learning communities promote persistence in that they foster peer group support, student involvement in classroom learning and social activities, perceptions of greater academic development, and greater integration of students'

academic and nonacademic lives (Pascarella and Terenzini, 2005). LCs, however, come in many varieties. In a synthesis of learning community research and assessment, Taylor (2003) found that LC programs not only have a broad reach in higher education but in spite of their promising results, most LC studies lack specificity and few probe deeply into the nature of LC interventions and their impact on the learning of students. The present study attempts to remedy this and focuses on the effectiveness of a summer bridge LC.

Summer bridge programs (SBP) are intensified versions of LCs that are designed to remediate academic skill deficiencies, provide information regarding college campus life, orient students to the institution's culture, and develop self-esteem and a sense of efficacy (Ackermann, 1991b; Evans, 1999; Fitts, 1989; Garcia, 1991; and Pascarella and Terenzini, 2005). These transitional programs are important for improving academic outcomes among low-income, underrepresented and underprepared populations. Bell and Natalie (2007) reported that summer learning programs have an intentional focus on accelerating learning, commitment to program improvement, sustainability and cost-effectiveness. Many studies have reported positive effects as a result of bridge program participation, including better grades, greater persistence and higher graduation rates than comparable non-participants (Evans, 1999; Garcia, 1991; and Pascarella and Terenzini, 2005). Additionally, Ackermann (1991a) and Fitts (1989) reported increased confidence levels as a result of learning communities. Such confidence can be seen as students' belief that they can be successful at a given task and thus expending effort is a worthwhile choice (Moller, Huett, Holder, Young, Harvey, and Godshalk, 2005). Other researchers, however, question the benefit of LCs. Researchers examined college transition of students over a two year period in a summer bridge learning community and report little or no effects (Walpole, Summerman, Nack, Mills, Scales, and Albano, 2008). They found no significant difference

between their students and a control group in number of credits attempted or in GPA. Persistence was slightly higher for the summer program (72% versus 69%), but not significantly so. One of the problems reported in assessing the effectiveness of SBPs and other LCs is a lack of control groups. This makes it difficult to attribute increased retention rates to the bridge programs. Evans, for example, explored effects of a bridge program using a control group and found no significant difference in retention rates (1999). Logan and colleagues (2000) compared retention rates of at-risk bridge program participants with at-risk nonparticipants and found no differences. Regardless, SBPs are seen by others as one solution to the retention problem facing colleges and universities (McElroy and Armesto, 1998; Pascarella and Terenzini, 2005). In spite of a lack of consistent empirical evidence supporting the efficacy of SBP and other such programs on improving GPA , there is support for effects of bridge programs on retention (Walpole et al, 2008). It should be evident from this review that LCs not only take many forms but have not been adequately investigated to date.

From this review of mixed results and lack of clear definitions regarding LCs, it should be apparent why more research is needed.

PURPOSE

The purpose of this inquiry is to investigate the role of precollege background variables, motivational attitudes, academic performance, and persistence behaviors among summer bridge learning community (SBLC) and non-SBLC members within a theoretically based model of college persistence.

RESEARCH QUESTIONS

Creating Higher Expectations for Educational Readiness (CHEER) is an SBLC for underprepared freshmen. In conducting this impact assessment of the CHEER program, two specific questions were addressed: (a) does participating in CHEER significantly contribute to academic performance and persistence; and (b) do motivational attitudes that students bring with them to their collegiate learning experience differ in their impact on persistence and academic performance for CHEER and Non-CHEER students?

THE MODEL

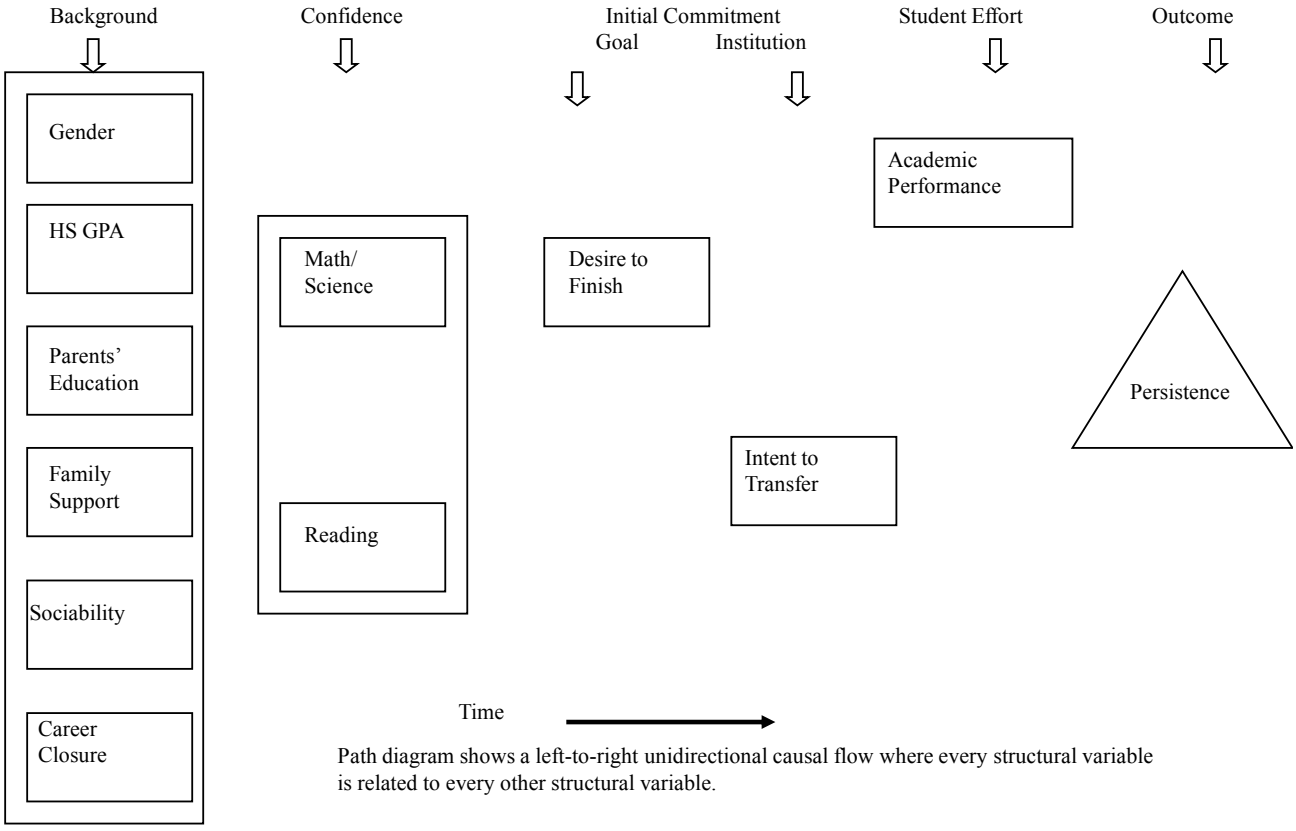
The model hypothesized in this study presupposes that precollege academic ability, other background factors, and motivation have a direct influence on college academic performance and persistence decisions, and that these variables have a stronger effect for CHEER members than for Non-CHEER members. To ensure that the study was well grounded in theory, a cross-sectional longitudinal method based on a combination of Tinto's student integration (1975, 1986) causal model, Bean and Vesper's (1990) student attrition model, and motivational theory perspectives was applied (Dweck, 1986, 1999; Allen, 1999; Allen and Nora, 1995; Ramist, 1981; and Urdan, 1997). Tinto (1975, 1993) posits that primarily the interaction of pre-college background factors, academic and social integration, and institutional and goal commitment lead to persistence decisions. Bean's (1980, 1985) model of educational persistence is strongly weighted on factors external to the institution, is centered on the centrality of behavioral indicators, and presumes that academic engagement and social involvement are keys to retention. Motivational perspectives applied to this study focus on initial commitments both to the goal of a college degree and to the institution. In this manner, motives may be seen as goals. These

constructs are similar and likely to tap the same underlying construct of academic goal commitment (Robbins, Lauver, Davis, Langley, and Carlstrom, 2004). In fact, college degree commitments can be viewed as a form of academic goal motivation (Allen, 1999). Commitment to the institution may be seen as students' confidence of and satisfaction with their institutional choice, the extent that students feel committed to the college they are currently enrolled in, or their overall attachment to college. Robbins and colleagues (2004) found that institutional commitment had a moderating positive relationship to retention. Its relatively high beta weight at the construct level (.263) indicates that "it can be a valuable predictor of retention, equal to or even better than the other traditional predictors of SES, HS GPA, and ACT/SAT" (p. 273).

The present study focuses on student background variables, academic confidence, initial goal and institutional commitment, student effort, and academic outcomes. The model proposed in the present study is restricted to the opposite ends of the freshman persistence spectrum. That is, it explores the impact of background and motivational factors at the beginning of the fall semester and their subsequent influence on academic performance and actual persistence behavior at the end of the first year. Researchers have demonstrated that nonintellectual factors play a major role in dropout decisions (Allen and Nora, 1995; Allen, 1999, and Bean and Vesper, 1990). In fact, in a meta-analysis of 109 studies, Robbins and colleagues (2004) found that academic goals, institutional commitment and social involvement, as well as six other psychosocial and study skill factors (unrelated to this study), significantly contributed to prediction of college outcomes, over and above those of socioeconomic status, standardized achievement, and high school GPA.

Figure 1 displays a structural model focused on external factors impacting persistence and the hypothesized interactions that motivation plays in the process.

FIG. 1. Hypothesized Causal Model



METHODS

The CHEER program has existed at the study institution since 2002 and was formed mainly to address the success of academically underprepared students who are disproportionately of low-income and underserved backgrounds. The program has been so successful since its inception that in 2008 and 2009 it received special funding from the state higher education system. Not only has the CHEER program been designated a model for the state system, the study institution has advised three other institutions in the system with planning of their summer

bridge programs (Bir, 2009). CHEER began with nine students and has just over 150 enrolled as of 2009. This summer bridge program is engagement-focused and has evolved over time to a fully residential experience at no cost to students. Much of the program structure and course design is based on findings from the National Survey of Student Engagement (Kuh, Kinzie, Schuh, Whitt, and Associates, 2005) that the more engaged students are, the better their grades and the more likely they will return to college for a second year (NSSE, 2007).

Student cohorts reflected in the present study consisted of those who enrolled voluntarily in CHEER to strengthen their preparation or get ahead by earning up to eight credits before their first year of college. Four of these are for English, three for math, and one for physical education. The English course focuses on academic literacy with emphases on reading, writing, and proofreading skills. The math course is pre-algebra. Completing more than four credits in summer school was sited as a significant factor contributing to degree completion, especially among minority populations (US Department of Education, Toolbox Revisited, 2006). In CHEER, students are assigned to a community of roughly twenty students with whom they attend class, participate in required tutoring sessions, and attend "Wise Choices," a series of evening and weekend programs and workshops that address co-curricular aspects of college life such as character and ethics, health and wellness issues, and goal setting.

Regarding research procedures, this study applied a quasi-experimental post-test only control group design. CHEER volunteers constituted the "experimental" group and Non-CHEER students served as the "control" group. Once the CHEER summer program concluded, both groups received a post-treatment measure (i.e., the College Student Inventory) during the first two weeks of the fall semester. Even though this study lacks randomized assignment to

groups, inclusion of a control group consisting of Non-CHEER students was intended to reduce threats to internal validity.

Freshmen from the latest four cohorts were studied beginning in 2005. By collapsing data into a single "grand" cohort, this study overcomes the limitation of a single-year focus. Results across multiple cohorts (i.e., 2005, 2006, 2007, and 2008) add stability to the conclusions one draws from the results. An examination of individual cohorts using ANOVA and Chi-Square revealed similar between- and within group variation. Statistical flexibility was enhanced as a result of using a collapsed, hybrid-type cohort. Therefore, four years' worth of data are used to explore findings.

Only first-time (i.e., no previous college record), full-time (12 semester credits or more) freshmen, who were registered as of the official fall semester university class day, were US citizens under 20 years of age, and not married were selected. These selection criteria were consistent with how the research literature defines "traditional college students." The typical first time freshman across all four cohorts was female (64%), under 20 (98%), in state (92%), and Black (85%). The sample accurately reflected the population across these dimensions. As to retention, the study institution consistently loses approximately 30 percent of its students between the first academic year and the beginning of the second year. This is the period of highest attrition at the institution. The number of freshmen initially retained in the study, and who had met all of these selection criteria, was 3,046 of the original freshmen "grand" cohort of 3,165. Of these, a fifth participated in the CHEER learning community program. This comparison of CHEER (n=620) and Non-CHEER (n=2,426) membership revealed no significant difference with respect to gender (females 67.4% versus females 62.4%), high school grade point

average (2.82 versus 2.80), and freshman year cumulative earned hours (27.7 versus 26.7). However, CHEER students possessed significantly higher freshman year GPAs (2.64 versus 2.42) and were retained at significantly higher rates (80.0% versus 69.6%).

The final data set captured for this analysis included only those students who also completed the College Student Inventory (CSI) Form B, from the Noel-Levitz Retention Management System (2000). This 100-item attitudinal survey administered the first two weeks of the fall semester examined a broad range of motivational attitudes that students brought with them to their collegiate learning experience. This final subgroup consisted of 2,433 students and represented 80 percent of the initial selection of 3,046 students.

The CSI is designed to assess both dropout proneness and student needs (Noel and Levitz, 2006). The survey obtains a broad array of information on students' family backgrounds, secondary school experiences, attitudes related to college, and initial impression of their college. As a dropout predictor, the CSI is designed to measure eventual dropout over a four-or five-year period, rather than after only one year. Nevertheless, the CSI has reasonable reliability (r=.80) among its major independent scales and high validity (r=.61) for predicting first-year college GPA (Miller, 2001). All negatively phrased items were reverse scored for consistency with other items in corresponding scales used in the study. After approximately two weeks into the semester, the Noel-Levitz Center returned the CSI results. Data from the CSI were then linked with four other institutionally derived variables (i.e., gender, high school GPA, college GPA, and actual retention to the second year). Comparisons between the original set and the subgroup revealed no significance difference across gender, high school GPA, first year GPA, first year earned hours, and persistence to the second year. As shown in Table 1, the CHEER-CSI group

(n=408) well represented the CHEER group; likewise, the Non-CHEER-CSI group (n=2025) did the same for the overall Non-CHEER group.

Table 1. Sample-to-Population Comparisons by Learning Community Status (Grand Cohorts: 2005 to 2008).

	Total		CHEER and CSI		Non-CHEER and CSI	
	Population	Sample	Population	Sample	Population	Sample
Measures	(N =3165)	(N =3046)	(N = 620)	(N=408)	(N =2426)	(N=2025)
Gender (female percent)	64.20	63.50	67.40	71.30	62.40	63.20
HS GPA (means)	2.80	2.81	2.82	2.84	2.80	2.79
Earned Hours Year 1 (means)	22.60	26.90	27.61	27.10	21.30	21.00
GPA Year 1 (means)	2.47	2.46	2.64	2.66	2.42	2.41
Persistence (percent)	71.50	71.80	80.00	74.50	69.60	65.10

Note: No differences between university derived population and sample data were significant.

Measures

Background Variables. A total of six variables were assessed: sex, high school GPA, parental education, family support, career closure, and sociability. Only the first two variables were extracted from university records. Of the other four, parental education was taken from the CSI as a composite of the education level of both parents. Family support (5 items), career closure (4 items), and sociability (4 items) were scaled scores representing averages across items ranging from 1 (not at all true) to 7 (completely true).

Confidence Constructs. A student's confidence in the following areas was assessed based on factor analyzed CSI items: Reading (9 items) and Math/Science (4 items). All were measured via a Likert scale ranging from 1 (not at all true) to 7 (completely true).

Desire to Finish College. This was a composite of four items from the CSI. As a noncognitive factor, it can be seen as a component of achievement motivation as a subheading under self-determination as described by Pittman and Boggiano (1992). Such desire is a form of exerting effective control over one's environment. White's (1954) seminal theoretical work proposed that this need for control was a fundamental impetus to human behavior. The question of self-determination as it relates to desire to finish college could be expressed as, "Why am I really going to college?"

Intent to Transfer. This was a composite of two items related to a students' intention to complete a degree at the study institution or transfer out.

Academic Performance (GPA). This was the students' cumulative freshman year grade-point average extracted from university records at the beginning of their second year at the university.

Persistence Behavior. Persistence, a dichotomous variable, was defined as the student's enrollment status in the subsequent fall semester after initial entry during the previous fall semester (1=withdrew; 2=enrolled).

Table 2 provides sources and definitions for the 12 measures in the study: gender, high school GPA, family support, career closure, parental education, reading confidence, math and

science confidence, sociability, desire to finish college, intent to transfer, cumulative freshman GPA, and persistence.

Table 2. Listing and Definition of Variables

Variables	Definitions
1 Gender[a]	1 = Male, 2 = Female
2 HS GPA[a]	
3 Parental Education[b]	Composite of the education level of the mother and father [Alpha = .51]: 1 = 8 years or less, 7 = Professional degree
4 Family Support[b]	Composite of 5 items [Alpha = .72]: 1 = Not at all true, 7 = Completely true
5 Career Closure[b]	Composite of 4 items [Alpha = .83]: 1 = Not at all true, 7 = Completely true
6 Sociability[b]	Composite of 4 items [Alpha = .75]: 1 = Not at all true, 7 = Completely true
7 Reading Confidence[b]	Composite of 9 items [Alpha = .81]: 1 = Not at all true, 7 = Completely true
8 Math/Science Confidence[b]	Composite of 4 items [Alpha = .69]: 1 = Not at all true, 7 = Completely true
9 Desire to Finish College[b]	Composite of 4 items [Alpha = .80]: 1 = Not at all true, 7 = Completely true
10 Transfer Intent[b]	Composite of 2 items [Alpha = .83]: 1 = Not at all true, 7 = Completely true
11 GPA[a]	Cumulative 1-year GPA
12 Persistence Behavior[a]	1 = Dropped after 1 year, 2 = Returned for 2nd year

Source: a = University Records; b = College Student Inventory

DATA ANALYSES

Constructs from the CSI reported to the institution by Noel-Levitz are based on comparisons with national samples and may not necessarily have relevance for our particular population. To remedy this, a two-step structural equation modeling procedure was employed in estimating parameters as recommended by Joreskog (1993), Anderson and Gerbing (1988), and Castaneda (1993). Stage one consisted of a SAS (Statistical Analysis System) generated exploratory factor analysis (EFA) used to estimate the measurement model prior to testing the structural model. In stage two, the hypothesized causal model was estimated using LISREL (Linear Structural Relations) for both CHEER and Non-CHEER students. Braxton and Hirschy (2004) echo the importance of using structural modeling techniques to gain a more complete reflection of the engagement-persistence relation.

During stage one, EFA as a data reduction technique was applied without assumptions to CSI data in order to discern useful patterns that might eventually be combined with other institutional data in order to improve student success and retention rates. The CSI Form B contains 100 self-reported items, 90 of which are measured on a Likert scale ranging from 1 (not at all true) to 7 (completely true). Several items were eliminated prior to the initial analysis due to their lack of relevancy with respect to this study. A total of 60 variables were subjected to the EFA procedure. In this study, each of the derived common factors is assumed to contribute to the variance of at least three of the observed variables. Less than three items per factor is generally considered a weak and unstable factor (Kim and Mueller, 1978). Maximum likelihood factoring (MLF) was chosen as the extraction method because of the relatively large data set and the fact that MLF provides a large sample significance test. Given the large sample size, multivariate

normality was assumed and MLF employed using promax rotation, an oblique rotation method which assumes variables are somewhat correlated.

The top six factors were retained and represented 30 items used in the final analysis. They were extracted using MLF and oblique rotation factor analysis with iteration method and resulted in accounting for nearly 39% of the weighted variance explained by each factor ignoring other factors. Reported in Table 3 are factor loadings for the six scales, proportion of variance accounted for by each factor after promax rotation, and Cronbach's alpha reliabilities. Reliabilities for these factors ranged from .69 to .83. Items in each factor were included if they correlated at least .50 with the factor. Factors with less than three items meeting this criterion were dropped. Factors were labeled 1-Desire to Finish College, 2-Reading Confidence, 3-Family Support, 4-Math and Science Confidence, 5-Career Closure, and 6-Sociability.

Table 3. Exploratory Factor Results After Promax Rotation: tem Loadings and Percent Variance

Factor/Item		Loading	Cronbach's Alpha	Percent Variance
I. Desire to Finish College			0.80	9.31%
1	I am strongly dedicated to finishing college—no matter what obstacles get in my way.	0.67		
2	I am deeply committed to my educational goals, and I'm fully prepared to make the effort and sacrifices that will be needed to attain them.	0.64		
3	I have a very strong desire to continue my education, and I am quite determined to finish a degree.	0.64		
4	Of all the things I could do at this point in my life, going to college is definitely the most satisfying.	0.63		
II. Reading Confidence			0.81	7.99%
5	I get a great deal of personal satisfaction from reading.	0.63		
6	I am very good at figuring out the deeper meaning of a short story or novel.	0.61		
7	In English class, I've had difficulty analyzing an author's style and theme. (reverse coded)	0.6		
8	Over the years, books have broadened my horizons and stimulated my imagination.	0.59		

9	I pick up new vocabulary words quickly, and I find it easy to use them in my speech and writing.	0.58		
10	I don't enjoy reading serious books and articles, and I only do it when I have to. (reverse coded)	0.56		
11	Learning new vocabulary words is a slow and difficult process for me. (reverse coded)	0.56		
12	I am capable of writing a very clear and well-organized paper.	0.51		
13	Books have never gotten me very excited. (reverse coded)	0.5		
III. Family Support			0.72	5.88%
14	My family had one way of looking at me when I was a child, and they didn't understand my feelings very well. (reverse coded)	0.63		
15	When I was a child, the other members of my family often said hurtful things that caused unpleasant feelings. (reverse coded)	0.59		
16	I am in a bad financial position, and the pressure to earn extra money will probably interfere with my studies. (reverse coded)	0.54		
17	I have financial problems that are very distracting and troublesome. (reverse coded)	0.54		
18	My family and I communicated very well when I was young, and we had a good understanding of each other's point of view.	0.51		

IV. Math/Science Confidence			0.69	4.85%
19	I have always enjoyed the challenge of trying to solve complex math problems.	0.73		
20	Math has always been a challenge for me. (reverse coded)	0.66		
21	I have a hard time understanding and solving complex math problems. (reverse coded)	0.56		
22	I have a very good grasp of the scientific ideas I've studied in school.	0.53		
V. Career Closure			0.83	7.11%
23	I am very confused about what occupation to pursue. (reverse coded)	0.78		
24	I have found a potential career that strongly attracts me.	0.75		
25	I have made a firm decision to enter a certain occupation and have begun planning my life around that decision.	0.74		
26	I become very confused when I try to choose an occupation. (reverse coded)	0.66		
VI. Sociability			0.75	3.57%
27	I am very adventurous and outgoing at large social gatherings.	0.7		

28	I greatly enjoy getting together with a crowd of people and having fun.	0.67
29	Participating in large social gatherings is of little interest to me. (reverse coded)	0.58
30	It is hard for me to relax and just have fun with a group of people. (reverse coded)	0.52
Total Variance Explained		38.71%

In stage two, the hypothesized causal model was estimated for both CHEER and Non-CHEER students using structural equations modeling (SEM) as recommended by Joreskog and Sorbom (2005). SEM research leads to better understanding of the complex networks of relationships among variables in a study. After PRELIS was used to produce a polyserial/polychoric correlation matrix, an asymptotic variance-covariance matrix was estimated to correct for possible violations to the assumption of bivariate normal distribution. The structural model was then analyzed using the LISREL 8.80 computer program. LISREL provides a weighted least squares (WLS) procedure for handling categorical and ordinal data and provides better estimates of the chi-square goodness-of-fit measures and standard errors whenever categorical data are involved and departures from normality are observed .

LISREL also provides indicators to judge the goodness-of-fit of the model and specific parameters in the model. Goodness-of-fit indices used in this study included chi-square and its associated degrees of freedom and probability level, the goodness-of-fit Index (GFI), the adjusted GFI, the root-mean-square residual (RMR), the norm fit index (NFI), Q-plots of

standardized residuals, and individual parameter estimates. Because of the exploratory nature of this study, modification indices recommended by LISREL were not considered. See Allen and Nora (1995) and Nora and Cabrera (1993) for a detailed review of acceptable values representing an adequate fit. As for statistical significance of the structural paths, one-tailed t-tests were employed, since the model hypothesized directional effects among the constructs.

FINDINGS

The primary purpose of this study was to investigate the role of precollege background variables, motivational attitudes, academic performance, and persistence behaviors among CHEER and Non-CHEER students. Table 1 provides sample-to-population comparisons by learning community and demonstrates that the samples drawn were representative of their respective populations. Table 2 describes the twelve measures analyzed in this study. There were six background variables (gender, high school GPA, family support, career closure, parent's education, and sociability), four motivational factors (reading and math/science confidence, desire to finish college, and intent to transfer), and two behavioral variables (cumulative freshman GPA and persistence behavior). Table 3 depicts the results of the factor analysis. Factor loadings, reliability scores, and percent variance indicate that the six factors of desire to finish college, reading and math/science confidence, career closure, family support, and sociability are all a valid representation of student attitudes in this study. All constructs were based on averages of scale scores across respective items with the exception of parent's education, which was taken as the sum of the father and mother's educational level. Reliability coefficients indicated a high degree of consistency among the various items used to measure the motivational constructs. Cronbach alphas ranged from .69 to .83. Table 4 displays summary

statistics and reliabilities for CHEER and Non-CHEER members, respectively. Significant differences between CHEER and Non-CHEER members across the twelve measures indicated that, on average, CHEER members were more likely to be female, have higher college GPAs, and returned to the university at greater rates.

Table 4. Means, Standard Deviations and Intercorrelations (polychoric) among CHEER and Non-CHEER Students
(Above the diagonal displays data for the CHEER group.)

	CHEER (N = 408)		Non-CHEER (N = 2025)			Correlations											
Variables	M	S.D.	M	S.D.	t-values	1	2	3	4	5	6	7	8	9	10	11	12
1 Gender	1.71	0.45	1.63	0.48	3.36***		0.294	-0.045	-0.054	-0.044	0.060	0.064	-0.063	-0.070	-0.056	0.117	0.004
2 HS GPA	2.84	0.53	2.79	0.52	1.70	0.209		-0.058	-0.032	-0.121	0.061	0.044	-0.079	-0.060	0.109	0.506	0.208
3 Parent Ed	3.71	0.95	3.67	0.84	1.28	0.021	0.006		0.174	0.029	0.033	0.090	0.009	-0.062	0.036	-0.109	0.015
4 Family	5.17	1.29	5.18	1.30	-0.16	0.016	0.007	0.122		0.081	0.199	0.083	0.181	0.200	0.126	-0.028	-0.067
5 Career	5.24	1.47	5.28	1.45	-0.62	0.013	0.001	0.032	0.134		0.091	0.137	0.150	0.253	0.120	-0.051	-0.020
6 Sociability	5.19	1.38	5.17	1.35	0.35	-0.051	0.023	0.078	0.137	0.103		0.124	-0.077	0.222	0.082	0.060	-0.017
7 Reading	4.42	1.11	4.40	1.11	0.36	-0.052	-0.005	0.107	0.077	0.205	0.112		0.080	0.164	0.052	0.097	-0.046
8 Math/Sci	4.19	1.33	4.11	1.39	1.09	0.015	0.026	0.014	0.075	0.109	0.040	0.112		0.088	0.034	-0.003	-0.015
9 Desire	6.37	0.87	6.36	0.85	0.18	0.041	-0.010	-0.038	0.193	0.298	0.211	0.060	0.060		0.184	-0.013	-0.052
10 Intent	4.54	2.06	4.56	2.04	-0.57	0.011	0.018	-0.085	0.127	0.081	0.034	0.043	-0.024	0.150		0.041	0.079
11 GPA	2.66	0.66	2.41	0.84	6.19***	0.166	0.478	0.037	0.018	0.006	0.045	-0.012	0.005	0.010	0.024		0.291
12 Persistence	1.75	0.43	1.65	0.48	3.88***	0.055	0.137	-0.010	-0.003	-0.007	0.060	-0.001	0.007	-0.003	-0.008	0.432	

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

Notes: Composite variables Family, Career, Sociability, Reading, Math/Science, Desire, and Intent: (1) Not at all true to (7) Completely true.

Gender scored as 1 = Male; 2 = Female

Parent's Education: Composite of father's and mother's education scored as 1 = 8 years or less to 7 = professional degree

Intent scored as composite of two items:

Item 1:"I plan to transfer to another school before completing a degree at this college or university." (reverse coded)

Item 2: "I have no desire to transfer to another school before finishing a degree at this college or university."

Persistence scored as 1 = Dropped after 1 year; 2 = Returned for 2nd year.

Tables 5 and 6 report the structural equation coefficients associated with testing the model in both CHEER and Non-CHEER groups. Models that fit well should have goodness of fit indices (GFIs) that approach one, norm fit indices (NFIs) approaching one, root square mean residuals (RMRs) close to zero, non-significant chi-squares, and chi-square-to-degrees of freedom ratios of less than 2.5 to 1 (Joreskog and Sorbom, 2005). The chi-square of the model for CHEER students was 0.74 (df= 1; p=.390), and 5.801 (df = 1; p= .0160) for the Non-CHEER members. GFIs for both groups were .999 and .998, NFIs were .998 and .995, and RMRs were .007 and .0093, respectively. Overall, results indicated that the model in this study fits the data moderately well.

CHEER Direct and Indirect Effects

Table 5 summarizes the structural equation model in examining direct effects of all independent variables on dependent variables. That is, it tested the effects of all six background variables (exogenous) on all other variables (endogenous). It also tested each antecedent endogenous variable on other subsequent endogenous variables in the model. Dependent variables were Persistence, GPA, Intent to Transfer, Desire to Finish College, Math/Science Confidence, and Reading Confidence.

Impacts on Persistence.

Two factors had significant direct effects impacting persistence decisions. Not surprisingly, college GPA had a positive impact on persistence (beta = .263). As expected, high school GPA had an indirect positive effect on persistence decision mediated through college GPA (gamma = .143). The model explained approximately 11% of the variance in CHEER

students' persistence decisions and ranked third overall in explained variance behind college GPA and desire to finish college.

Impacts on GPA.

Three of ten factors were found to be significant in explaining first year cumulative grade-point average. The most influential factor on students' GPA was exerted by high school GPA (gamma =.512). Parent's education had an inverse effect on GPA (gamma = -.088). Higher GPAs were associated with students from families with low levels of parental education. Reading confidence had a significant direct impact on first year GPA (beta = .085). The higher one's reading confidence, the greater the CHEER member's college GPA. The model explained 27% of the variance observed in CHEER members' GPA. This was the largest impact on any dependent variable.

Impacts on Intent to Transfer.

Desire to finish college positively impacted intent to transfer (beta = .156). That is, the higher the student's desire to finish college, the more likely they were committed to finishing a degree at the study institution. The model explained on 7.2% of the variance in transfer intentions.

Impacts on Desire to Finish College.

Of eight independent factors assumed to be antecedents to a student's desire to finish college, six had significant impacts. The largest influence came from Career Closure (gamma = .200). CHEER students with high desire to finish college were likely to be certain of a future occupation, had high Sociability (gamma = .172), positive Family Support (gamma = .149),

strong Reading Confidence (beta = .116), parent's with low levels of education (gamma = -.115), and were likely to be male (gamma = -.065). High school GPA and math/science confidence had neither direct nor indirect effect on desire to finish college. The model explained 15.4% of the variance in desire to finish college. This was the second highest impact on any dependent variable.

Impacts on Math/Science Confidence.

Confidence in math or science was strongly associated with positive family support (gamma = .199). CHEER students with high family support tended also to have high math/science confidence. The model explained nearly 8% of the variance in Math/Science Confidence.

Impacts on Reading Confidence.

No measure had a significant impact on reading confidence. This finding might partially be explained by the fact that the population from which these CHEER students were drawn was typically underprepared academically. They typically had a B- (i.e., 2.8) high school GPA. It is not surprising then that this slightly above average GPA would fail to positively link with enhanced reading confidence. A reading intensive program such as CHEER may have resulted in increased confidence in reading ability and subsequently higher grades in college.

Non-CHEER Direct and Indirect Effects

Table 6 summarizes the structural equation model in examining direct effects of all independent variables on dependent variables for the Non-CHEER group.

Impacts on Persistence.

Two factors had either direct or indirect effects on persistence. College GPA had a direct positive effect (beta = .476) and high school GPA had a significant positive indirect effect (gamma = .221) mediated through college GPA. The model explained approximately 20% of the variance in Non-CHEER students' persistence decisions and ranked second overall in explained variance behind college GPA.

Impacts on GPA.

Only high school GPA had a significant influence on college GPA (gamma = .463). The model explained nearly 24% of the variance observed in Non-CHEER members' GPA. This was the largest impact on any dependent variable.

Impacts on Intent to Transfer.

Desire to finish college was the only factor significantly influencing a Non-CHEER students' intent to transfer (beta = .113). The higher the student's desire to finish college, the more likely they were committed to finishing a degree at the study institution. The model explained nearly 5% of the variance in transfer intentions.

Impacts on Desire to Finish College.

Four of eight independent factors assumed to be antecedents of a student's desire to finish college had significant impacts. As with the CHEER group, the largest influence came from Career Closure (gamma = .224). Non-CHEER students with high desire to finish college were likely to be certain of a future occupation, had high Reading Confidence (beta = .188), elevated

Sociability (gamma = .159), and positive Family Support (gamma = .137). The model explained 18.1% of the variance in desire to finish college and ranked third overall in variance explained within this subgroup.

Impacts on Math/Science Confidence.

Confidence in math or science was strongly associated with career closure (gamma = .125). Non-CHEER students with certainty of career choice tended also to have high math/science confidence. The model explained only 2% of the variance in Math/Science Confidence.

Impacts on Reading Confidence.

Career closure also had a significant positive impact on reading confidence (gamma = .201) and explained nearly 7% of the variance in Reading Confidence for the Non-CHEER group. Such reading confidence, however, failed to impact Non-Cheer member first year college GPA or persistence.

Table 5. CHEER Standardized Parameter Estimates for Direct and Indirect Effects of Endogenous Variables

DIRECT EFFECTS

	Dependent Variables					
Measures	Reading	M/S	Desire	Intent	GPA	Persistence
1 Gender	0.058	-0.027	-.065*	-0.083	-0.045	-0.045
2 HS GPA	0.045	-0.040	-0.031	.156*	0.512***	0.086
3 Parent Ed	0.078	-0.027	-0.115**	0.033	-0.088**	0.059
4 Family	0.057	.199*	0.149**	0.081	-0.017	-0.063
5 Career	0.141	0.154	0.20**	0.089	-0.006	0.016
6 Sociability	0.085	-0.119	.172*	0.019	0.034	-0.016
7 Reading			0.116*	0.001	0.085*	-0.071
8 Math/Sci			0.033	0.001	0.042	-0.001
9 Desire				0.146	-0.008	-0.032
10 Intent					-0.018	0.072
11 GPA						0.263***
Squared Multiple R	0.049	0.075	0.154	0.072	0.274	0.110

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

INDIRECT EFFECTS

	Dependent Variables					
Measures	Reading	M/S	Desire	Intent	GPA	Persistence
1 Gender			0.006	-0.009	0.006	-0.019
2 HS GPA			0.004	-0.004	0.001	.143**
3 Parent Ed			0.008	-0.015	0.006	-0.022
4 Family			0.013	0.024	0.010	-0.004
5 Career			0.021	0.032	0.014	0.001
6 Sociability			0.006	0.026	0.001	0.001
7 Reading					-0.001	0.020
8 Math/Sci					0.001	0.010
9 Desire					-0.003	0.008
10 Intent						-0.005

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

Table 6. Non-CHEER Standardized Parameter Estimates for Direct and Indirect Effects of Endogenous Variables

DIRECT EFFECTS

	Dependent Variables					
Measures	Reading	M/S	Desire	Intent	GPA	Persistence
1 Gender	-0.054	0.008	0.062	0.003	0.069	0.001
2 HS GPA	0.004	0.023	-0.026	0.019	0.463***	-0.092
3 Parent Ed	0.091	0.004	-0.096*	-0.097*	0.033	-0.033
4 Family	0.034	0.058	0.137**	0.115	0.003	-0.008
5 Career	0.201**	0.125*	0.224**	0.039	0.002	-0.010
6 Sociability	0.079	0.027	0.159*	-0.001	0.035	0.048
7 Reading			0.188**	0.009	-0.016	0.010
8 Math/Sci			0.006	-0.044	-0.010	0.007
9 Desire				0.113**	0.006	-0.015
10 Intent					0.015	-0.018
11 GPA						0.476***
Squared Multiple R	0.068	0.023	0.181	0.045	0.236	0.197

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

INDIRECT EFFECTS

	Dependent Variables					
Measures	Reading	M/S	Desire	Intent	GPA	Persistence
1 Gender			-0.01	0.005	0.001	0.032
2 HS GPA			0.001	-0.004	0.001	0.221**
3 Parent Ed			0.017	-0.008	-0.004	0.018
4 Family			0.007	0.014	0.002	-0.001
5 Career			0.039	0.026	-0.002	-0.002
6 Sociability			0.015	0.019	0.001	0.015
7 Reading				0.021	0.002	-0.010
8 Math/Sci				0.001	-0.001	-0.004
9 Desire					0.002	0.002
10 Intent						0.007

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

LIMITATIONS

Three main weaknesses limit this study. First, the fact that CHEER program membership was completely voluntary (versus part of a conditional acceptance package) may have skewed the results. Stassen (2003) noted that the role of student self-selection into LCs remains an issue in understanding their impact. Second, CHEER members began their collegiate journey earlier than their Non-CHEER peers. This sequencing may have influenced responses to the motivational survey. And third, the study is clearly limited in scope by its single-institution focus in spite of its multi-year cohort representation. All these factors should be taken into consideration when generalizing results.

DISCUSSION

The current study examined whether precollege background variables and motivational attitudes significantly contributed to academic performance and persistence for CHEER and Non-CHEER learning community members. Findings as depicted in Table 4 and the summary diagram of significant effects in Figure 2 strengthened several assertions cited herein and weakened others. The assertion that membership in the CHEER learning community influenced student outcomes was supported. CHEER members ended their first academic year with higher cumulative GPAs and returned the following fall at greater rates. As Pascarella and Terenzini (2005) concluded after reviewing three decades of research on college impacts, grade performance is a critical predictor of persistence and educational attainment, even when other important predictors are controlled, including precollege characteristics (such as ability, secondary school achievement, and motivation), SES, characteristics of the institution attended and other college experiences (such as major and social involvement).

The assertion that background variables, academic confidence and initial commitments played key roles in the persistence process was partially supported. Two of the six background variables had an impact on academic performance: precollege academic ability and parents' education. In the present study, HS GPA played the most significant precollege role in influencing college academic performance, regardless of learning community membership. Parents' education, however, revealed differentiating effects. CHEER members whose parents had lower educational levels tended to have elevated college GPAs. There was no parental education effect for Non-CHEER members. It may be that among CHEER members, students were either more motivated to put forth greater academic effort partly as a result of wanting to achieve something their parents lacked or it could be that parents themselves provided greater academic encouragement at home. Such logic is partially supported in this study through the construct of academic confidence.

Academic confidence, a form of self-efficacy, was found to make a difference in this study. Reading confidence proved significant among CHEER members. Those with elevated confidence levels in their reading ability also had significantly higher first year college cumulative GPAs. This finding is in sync with Multon, Brown and Lent (1991) who found significant positive correlations between a students' sense of self-efficacy (i.e., confidence) and their academic performance. As a form of academic self-efficacy, reading confidence may be seen as a self-evaluation of one's ability and/or chance for success in reading at the collegiate level. In their meta-analysis, Robbins et al (2004) found that "academic self-efficacy and achievement motivation were the strongest additional contributors along with high school GPA and standardized test performance" (p. 276). In the present study, and given the parity of precollege academic performance between CHEER and Non-CHEER members, this finding of a

direct link between reading confidence and first year GPA has positive implications for participating in a reading intensive summer bridge program such as CHEER. Engstrom and Tinto's (2007) review of nineteen institutions with particularly effective learning community programs for academically underprepared students underscored the importance of academic confidence in the persistence process.

Another assertion of this study was that some level of desire is necessary to persist in college. This study found no support for this notion. Unlike in Allen (1999), desire to finish college was not significantly linked either to academic performance or persistence. This is not to say that desire to finish college is not important. Of the six dependent variables in this study, desire ranked second and third among CHEER and Non-CHEER members, respectively, in terms of variance accounted for. It is noteworthy that for both groups, nearly all background variables and reading confidence had significant effects on desire to finish college.

Overall, the findings indicate that the hypothesized causal model was generally valid in explaining background and motivational factors of both CHEER and Non-CHEER members and subsequent outcomes including academic performance and persistence. In the model, eleven variables were hypothesized to impact persistence for both CHEER and Non-CHEER members. Only academic performance impacted persistence. Ten variables were said to influence college academic performance. Three of these did so. Support was found for HS GPA for both groups; and parents' education and reading confidence for the CHEER members only.

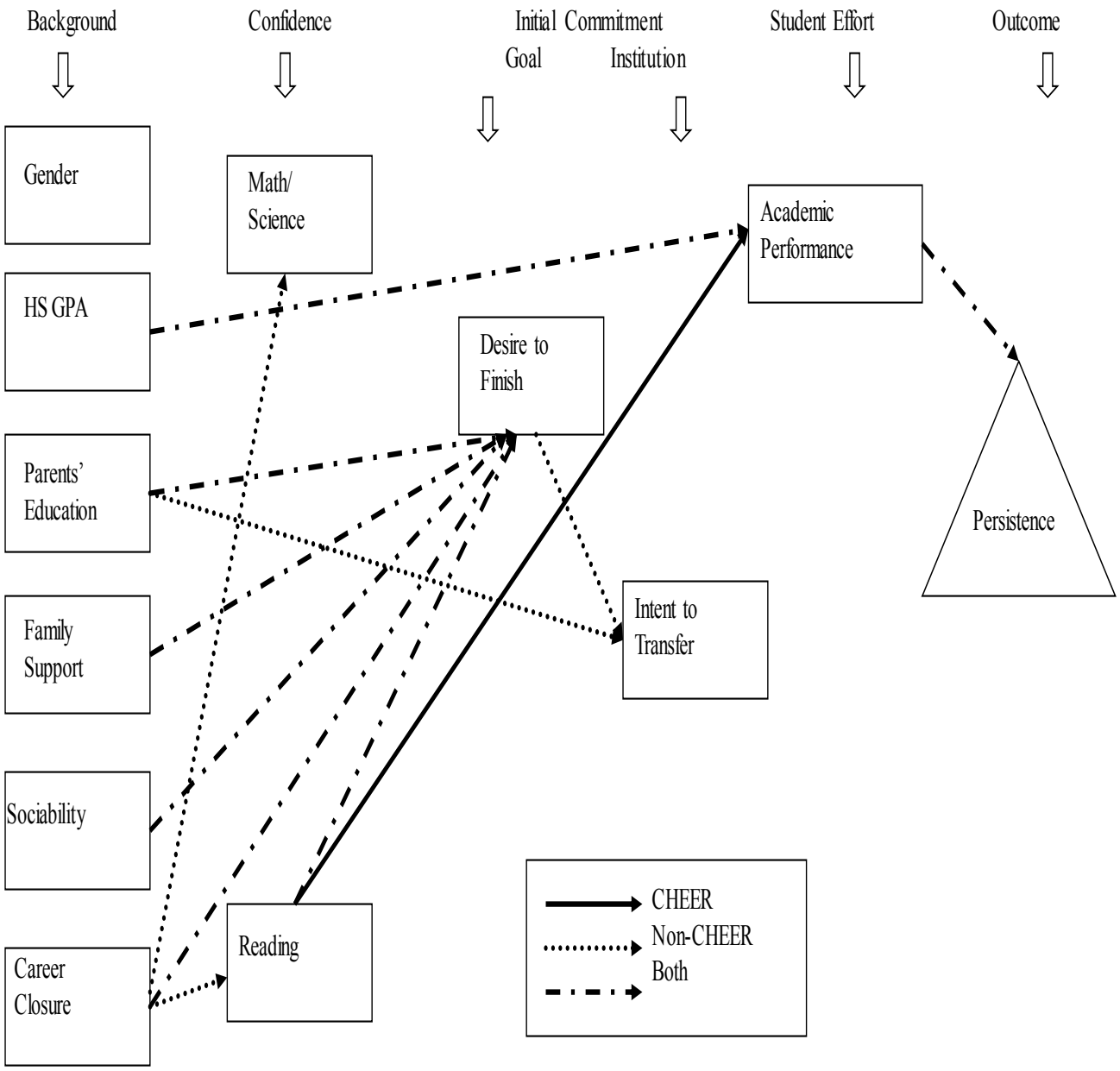
In summary, this article specified and estimated a model describing summer bridge earning community membership, motivation to persist, and factors that influence each group. Besides CHEER members outperforming and persisting relative to Non-CHEER students, the

most important finding emanating from this study is that there is a confidence effect for CHEER members but not for Non-CHEER members in terms of educational outcomes. CHEER members with elevated levels of reading confidence were significantly linked to greater first year academic performance. At first, one may attempt to attribute this discovery to differences in precollege academic ability, suggesting that those with higher HS GPAs would naturally have higher reading confidence and subsequently college GPAs. This was not an issue in the present study given that high school GPAs did not differ significantly between CHEER and Non-CHEER members. It is plausible that CHEER students had higher reading confidence as a result of their reading intensive CHEER experience.

This research is significant in two respects. First, it empirically verifies the conventional wisdom that background and motivational factors may affect subgroups differently and is responsible in part for influencing academic achievement. Second, the findings of this study suggest the possibility of theoretical linkages between precollege motivational factors and academic performance (i.e., reading confidence and parents' education). This investigation found a significant relationship between magnitude of reading confidence and CHEER group academic performance. Whereas this study omits the impact of subsequent goal or institutional commitments, it leads one to conjecture that there may be some connections between theories of academic motivation and reputable models of student retention applied to various learning communities. Elevated reading confidence influenced by a summer bridge program may be a psychological component to "getting ready" behaviors associated with subsequent academic demands of the collegiate experience.

Both theoretical and practical implications result from this study. In the main, there is a need for future theoretical work in the area of student persistence to pursue possible connections between theories of student departure and motivation for varying kinds of learning communities. From a practical point of view, it is imperative that campus intervention strategies be assessed. An early warning system such as the CSI used in this study is a good start in identifying "high risk" students. This notwithstanding, more is needed in this time of fiscal restraint to demonstrate the effectiveness of methods to retain students. This current assessment of the CHEER program clearly demonstrates that the program is a highly effective and necessary, though not sufficient, means to combat high risk before it turns into high rates of departure. Sufficiency might be achieved by extending LCs beyond the first year. Engstrom and Tinto (2007) report that students typically do not see their academic counselor after their LCs end during their first year. Future research should investigate the effects of those programs which do extend or modify such learning communities. The model of the LC and its potential beyond the first year may be an important bridge needed especially for low-income and those from underserved populations to cross the multiple academic Rubicons facing them in college.

FIG. 2. Summary of significant effects from causal model



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