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Evaluating the First Year Experience:

Students' Knowledge, Attitudes, and Behaviors

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Students typically view their enrollment in college as an opportunity to acquire the knowledge and skills that are necessary to succeed in the workplace and to advance their general knowledge and life skills (Carter, Bishop & Kravits, 2006). The rate of entry into college provides "an indication of the degree to which a country's population is acquiring higher-level skills and knowledge" (Wirt et al., 2004, p. 62). However, in 2004, one in four college freshmen at 4-year universities did not return for their sophomore year and nearly half of students in community colleges did not return to complete their degree (Netscape News with CNN, 2004). Empirical research over the last several decades corroborates these findings (Astin, 1975; Tinto, 1993). Tinto described this as a tremendous loss of resources (i.e., talent and revenue) and a principal concern for students, parents, and administrators. As a result, many universities and colleges have implemented some form of intervention, formal or informal, to increase academic achievement and positive social adjustment. These efforts are focused on increasing retention and graduation rates.

Summary

First Year Experience (FYE) programs have been implemented in universities and colleges to address the emergent needs of matriculating students. It is well documented that many students are not prepared for the rigors of postsecondary education and FYE programs are designed to supplement the necessary academic and life skills. These academic and life skills range from knowing the location of the library to seeking out appropriate personnel when personal issues arise. Evaluating programs developed to address such a wide range of knowledge and skills is an obvious challenge, especially when each FYE is customized for each corresponding university or college.

In the case of one FYE program at a large university, evaluation of student Knowledge, Attitudes, and Behaviors (KAB) provided a conceptual model to examine the program as a whole. This particular study revealed the following about the FYE program:

- The KAB approach is pragmatic and efficient.
- FYE programs are capable of increasing knowledge, which is a principle objective of the courses.
- The FYE program impacted attitudes associated with academic and life skills.
- Males and females participate and respond to the FYE differently. For example, females reported significantly higher attitudes than males.
- The study of FYE Programs overall is highly complex. Further longitudinal studies focusing on retention and attrition are needed.

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This study examines an intervention program that has been developed for first-year college/university students to facilitate the transition to postsecondary education. The First Year Experience (FYE) program has been in place at a large Northeastern university for more than 10 years and is designed to facilitate the acquisition of traditional academic and social skills. These skills vary widely but include study skills (e.g., note taking, library research), time management skills, institutional awareness (e.g., location of the library), and appropriate interpersonal behavior (Kuo, Hagie, & Miller, 2004; Kuh, 1995; Terenzini, Pascarella, & Blimling, 1996; Zhao & Kuh, 2004). The FYE program addresses these topics via a one-credit elective course that incorporates personal speakers, seminars, and online collaboration. Given the complexity and variety of topics associated with the program as well as the complexity, a multiple construct approach was used to evaluate the FYE program. Specifically, this study examined students' change in knowledge, attitudes, and behaviors (KABs) associated with these issues over time (see Schrader & Lawless, 2004, for more information on the KAB approach to program evaluation).

Review of the Literature

Factors of a Successful Collegiate Experience

By understanding the entry characteristics of newly matriculated college students and their developmental experiences, we are better equipped to facilitate student development and growth. Terenzini et al. (1994) identified several variables that influence this transition, including academic and social involvement, family background, peer group, socioeconomic status, and academic preparation. According to researchers, involvement is the extent to which a student participates in academic as well as nonacademic (e.g., social) activities (Kuh, 1995; Terenzini et al., 1994). Astin (1984) identified academic involvement, involvement with faculty, and involvement with peer groups as three of the most

influential forms. Kuh found that students attribute involvement in certain activities (i.e., leadership, peer, academic, faculty, work, travel, or ethos related activities) as positive developmental factors in college. Further, according to Kuh, "the curriculum is, without dispute, the organizing framework for academic institutions. At the same time, students benefit in many ways from out-of-class experiences, ranging from gains in critical thinking to relational and organizational skills . . ." (pp. 149–150).

Whether from in-class or out-of-class experience, researchers acknowledge that academic and social skills, along with learning and thinking strategies, play a significant role in academic success. Dickinson and O'Connell (1990) advocated high-quality time on task, while White and Shahan (1989) focused on the broader topic of motivation. Ting, Grant, and Plenert (2000), Turner (1992), and Zhao and Kuh (2004) stressed the importance of involvement in social activities and involvement in academic counseling as factors in collegiate success. In a more recent study, Kuo et al. (2004) examined several note-taking, study, test-taking, technology, and social skills in relation to student success and the manner in which students behave in order to achieve that success. Kuo et al. found that in academic areas, students often work individually, relying on their existing skill sets rather than utilizing campus resources or social groups to achieve success. With respect to technology, Miller and Pope (2003) reported that universities have increased their expectations and often require students to have their own personal computer. Collectively, these studies reflect the range of academic and social skills that are vital for student success in college.

Unfortunately, research indicates that some students currently enrolled in colleges and universities are not prepared to meet the academic and social challenges of postsecondary education. For example, Wirt et al. (2004) reported that in the fall of 2000, approximately 76% of postsecondary institutions offered some form of remediation in the area of basic skills (i.e., reading, writing, or mathematics), suggesting that many students entering postsecondary education are underprepared for the academic demands of college. Pitts, White, and Harrison (1999) found

that many professors perceive a decrease in student motivation to learn and a willingness to adopt a passive learning approach, as compared to a generation ago. Even if they are prepared academically, students may neither be aware of, nor use, existing services (e.g., technology labs, libraries, counseling services) to their advantage (Crismore, 1984). These issues are compounded by the fact that at a postsecondary level students suddenly depart a familiar teacher-directed environment and enter a student-directed environment (Wratcher, 1991). In college, students must manage their time and allocate their own resources toward completing their assignments, which, as Wratcher observed, is often difficult for freshmen. If these factors are not addressed adequately, they present an obstacle for everyone involved. Students who do not successfully manage their first year "stop-out" or drop out of school entirely (Astin, 1975; Tinto, 1993).

Fortunately, there are many learnable skills and traits that influence success in college. Garavalia and Gredler (2002) reported that several factors are linked to student performance including prior GPA, SAT scores, and organization and planning. However, unlike SAT scores and prior GPA, "organization and planning can be manipulated" (p. 624). In circumstances where factors lie outside the direct influence of a university (e.g., family background, peer group, and socioeconomic status), additional local, college/university, and federal resources help provide support for the students (Sonnenberg, 2004). Whether universities elect to add resources or provide direct instruction with respect to trainable skills, solutions exist to facilitate students' adjustment to their first year in postsecondary education.

First Year Experience Programs

In response to the growing need to prepare students for their first year, many universities have developed programs and initiatives intended to facilitate the transition to college. Although early efforts took the form of increased institutional resources such as libraries, writing centers, computer labs, or personal computers (Miller & Pope, 2003; Pascarella & Terenzini, 1991),

universities and colleges also have offered courses and seminars focused on the development of academic skills and social skills (Howard & Jones, 2000). Whether the courses were offered as formal requirements or an option, they are almost exclusively designed to impart information (i.e., knowledge) and experience to students (Barefoot & Gardner, 1993; Gelb, 2007; Howard & Jones, 2000; VanderStoep & Pintrich; 2008; Wratcher, 1991). These curricular initiatives have taken the name: First Year Experience programs (or FYE).

White, Goetz, Hunter, and Barefoot (1995) were among the first researchers to describe the FYE intervention strategy in detail for incoming first-year students. Their research focused not only on the assessment of first-year students' skills and degrees of success, but also on the design and implementation of the program. White et al. suggested that the FYE should afford students opportunities to interact socially (with peers and faculty) as well as introduce students to academic facilities, counseling staff, and other faculty during advising/planning sessions. They described program content, structure, and goals. The FYE program "should be understood not as single events, but as processes that should be linked programmatically" (White et al., 1995, p. 33). This early work has informed FYE programs nationwide, including the FYE program currently under investigation.

In addition to describing the various program objectives and curricula (e.g., study skills, social skills), White et al. (1995) indicated that FYE programs must be tailored to suit the needs of the university that sponsors it. Unfortunately, this presents obvious challenges in terms of program evaluation. Universities vary in many ways, as do the corresponding FYE programs and course topics, and evaluation strategies must be developed to suit those particular needs. At the same time, assessment strategies must remain comprehensive and address the FYE program as a whole. Because of the complexities involved, researchers have argued that a multiple construct approach is appropriate when evaluating interventions (Schrader & Lawless, 2004). One multiple construct approach in particular, the Knowledge, Attitudes, and Behavior (KAB) methodology, has been argued to be efficient and effec-

tive when evaluating complex, multifaceted interventions like the FYE program (Schrader & Lawless, 2004). This approach evaluates participants' cognitive, affective, and behavioral constructs as they pertain to an intervention. Although other variables may be of interest, these constructs are of interest because they have been shown to be interrelated (Alexander, 1992; Alexander, Jetton, & Kulikowich, 1995) and important factors in the learning process (Alexander, 2003). Because of its ability to measure multiple constructs holistically, the KAB methodology is an appropriate evaluation strategy for the FYE program.

Gender

Although White et al. (1995) recommended that FYE programs should be evaluated holistically, universities often focus on the first-year population as a whole. They adopt a "one-size-fits-all mentality about serving college students" (Kuo et al., 2004, p. 65) that does not reflect the variability across institutions. More importantly, this evaluation approach neglects the ways in which males and females have been shown to differ on many cognitive tasks (Caplan & Caplan, 1997; Hutt, 1972; Hyde & McKinley, 1997; Kimura, 1999; Richardson, 1997). For example, there is a tendency for girls to outperform boys across grades and across some subject areas as they mature (Dwyer & Johnson, 1997; Pomerantz, Altermatt, & Saxon, 2002). These areas include mathematics, English, and technology (American Association of University Women, 1996; Hyde, Fennema, & Lamon, 1990). Although these differences in mathematical and verbal ability continue to persist, the magnitude of these differences appears to be declining (Halpern, 2000; Reis, 1998). However, this performance appears to come at some cost. It has been suggested that while younger females, on average, achieve higher academic grades than males, they also are susceptible to increased internal distress and anxiety related to academic preparation and performance (Pomerantz et al., 2002).

At the university level, males and females have been shown to exhibit differences in the ways they cope with stress (Lawrence,

Ashford, & Dent, 2006). Males on average report higher self-esteem as a result of their coping style (emotional inhibition), while females report higher levels of attainment. Beyond cognitive and psychological factors, gender continues to emerge as an important issue. Specifically, the demographics of universities and colleges are changing. Women were awarded 57% of all bachelor's degrees in the U.S., a statistic that has steadily risen since 1970 (Wirt et al., 2004). Given the quantity of research in the area and the changing student population, developing and evaluating FYE programs also must examine the possible differences between males and females.

Collectively, all students face adjustment issues, and steps should be taken to develop appropriate interventions (Garner & Jewler, 1992; Wratcher, 1991; Zhao & Kuh, 2004). These interventions are directed toward the skills and knowledge that will enable students to adjust to college and to be successful both academically and personally. However, only through understanding student needs will we be capable of designing effective interventions. For these reasons, we were interested in implementing a KAB battery in an effort to evaluate the effectiveness of the FYE program. Specifically, the following sets of research questions were addressed:

1. Are there significant differences in the ways students enrolled in the FYE program and a comparison group respond to the KAB battery? Is there a difference over time?
2. Are there significant differences in the way males and females respond to the KAB battery? Is there a difference over time?

Methods and Procedures

Current Contexts

This research took place in the context of the FYE at a large Northeastern university in the United States. The FYE pro-

gram begins with a 3-day student orientation session introducing matriculating students to the physical layout of the campus, socializing them with a group of their peers, and introducing them to the academic environment. During orientation, students meet with advisors, schedule courses, and take placement tests. They also participate in various social and community building activities. Following orientation, the majority of matriculating students (approximately 65% in 2002 rising to 88% in 2006) enroll in an FYE course during their freshman year.

The FYE program is offered as a one-credit course with multiple sections. Each section addresses common program-wide instructional objectives and topical issues related to specific subgroups within the university. For example, engineering students are encouraged to enroll in an engineering seminar where they will learn about specific course requirements, while honors students enroll in sections developed for them. University faculty and staff knowledgeable in their particular content area and in student advising, teach the various sections. In some cases, sections are cotaught with a student facilitator who recently completed a leadership course. Although instruction in each section is variable, every section addresses the same overall content and instructional objectives (e.g., academic skills, library use, and social conduct), thereby maintaining programmatic consistency. A characteristic of the FYE program at this institution is small class size, 18 students or fewer.

Utilizing technological and face-to-face resources, the FYE program is designed to enhance a student's time management, communication, social interaction, and study skills, as well as to help develop strategies for problem solving and critical thinking. Students get to know a faculty member or a professional staff person to whom they can turn for advice and support in the future. Implemented in this way, the FYE is structured to impart a set of academic skills as well as to foster a sense of community. Both of these global objectives have been shown to be vital in the transition into postsecondary education.

Table 1

Frequency of Gender by Treatment Group

Student Group	Gender		
	Female	Male	Total
FYE	461	209	670
Comparison	141	93	234
Total	602	302	904

Participants

Approximately 65% of incoming freshmen voluntarily enrolled in the First Year Experience (FYE) program at a large Northeastern university in the fall of 2002. The remaining 35% of incoming freshmen opted not to participate in the FYE program and therefore served as the comparison group. Data were collected from 2,768 entering freshmen (which accounts for approximately 87% of the 3,185 person entering freshman class) during their orientation sessions and from 1,141 students at the end of their first semester. Although all students enrolled in the FYE program took part in the curriculum activities, only those who provided informed consent were included in this study.

Initial screening of the data revealed a total of 904 usable, matched (pre and post) data points. A total of 670 (74.1%) students enrolled in the FYE while the remaining 234 (25.9%) students served as a comparison group. The total sample was comprised of 602 females (66.6%) and 302 males (33.4%). The frequency of gender by student group is provided in Table 1. Overall enrollment characteristics for the Fall of 2002 are presented in presented in Table 2.

Instrumentation

A battery of self-report scales measured the participants along three theoretical dimensions, Knowledge, Attitudes, and

Table 2

Overall Student Characteristics for Fall 2002

Student Characteristics	Undergraduate—18,662 (3,185 freshmen)	Grad/ Professional—7,180
Female	53%	53%
Male	47%	47%
Minority	17%	12%
International*	1%	18%
In-State Residents**	80%	70%
Full-Time Degree	85%	57%
Part-Time Degree	9%	33%
Non-Degree (FT & PT)	6%	10%

*107 countries were represented in the 2001–2002 international student population.

**76% of undergraduates on main campus are in-state residents.

Behaviors (KABs; Schrader & Lawless, 2004). The three different scales were administered together. Each scale addressed a different theoretical dimension (i.e., Knowledge, Attitudes, and Behaviors) as they pertained to academic and life skills of college freshmen. The Knowledge and Attitude scales each contained 22 Likert-type items using a 5-point Likert response format, ranging from (1) *strongly disagree* to (5) *strongly agree*. The Behavior scale contained 18 items at pretest and also was formatted as a Likert (1) *never* to (5) *frequently* with a *not applicable* selection (no value). A list of the items for each scale from the battery is presented in Appendix A.

Instrument Administration

The pretest battery was administered to all students attending the FYE orientation in paper-and-pencil format. The posttest battery was administered to students via the Web at the conclusion of the fall semester. FYE program instructors used WebCT® during the course to facilitate data collection (e-mails, instructor request, etc.). Small incentives were offered for the

completion of the instrument battery (i.e., gift certificates to the college bookstore). Students in the comparison group had no access to the FYE WebCT® site and were therefore contacted via e-mail and through professors in other general freshman year courses (e.g., introductory psychology).

Preliminary Data Analysis

Previous implementations and analysis of this battery have revealed that the scores on each scale (i.e., Knowledge, Attitudes, and Behaviors) show evidence of reliability and validity for use with a college population (Schrader, 2003; Schrader & Brown, 2004). These implementations also revealed that each scale was multidimensional. According to these earlier investigations, the scores from the Knowledge scale were grouped into four distinct and stable components, the scores from the Attitude scale were grouped into two components, and the scores from the Behavior scale were grouped into four components. Table 3 presents these components (i.e., variables), their reliabilities, and the items that corresponded to them.

According to Stevens (1996), principal component analysis is a psychometrically sound procedure to reduce a large number of predictors (15 to 40) without detracting from one's ability to draw inferences from the results. Following this advice, raw scores on the original scaling were used in the analysis (Grice, 2001). In this case, summing the responses for the scale and then dividing the total score by the number of items for each component created the scale scores. This process created scale scores that remained on the original 5-point scale, enabling comparisons across conditions and scales. Using scale scores allowed greater parsimony within the multivariate model. The means and standard deviations with respect to student groups are presented in Table 4. The means with respect to gender are presented in Table 5.

Initial screening of the data did not reveal any statistical problems with the data. However, using the metrics described by Tabachnick and Fidell (1996), some of the variables posed a pos-

Table 3

Component Variables and Corresponding Items

Knowledge Components and Description	Items	Alpha
Knowledge of Resources: Items pertained to the use of resources, including technological resources.	6, 11, 12, 13, 17, 18	.76
Knowledge of Academic Skills: Items that pertained to academic issues (e.g., note-taking, academic goal setting, and school effort).	1, 2, 3, 9, 16	.79
Knowledge of Health and Wellness: Items referred to issues of personal and social awareness, general health issues, or medical issues.	14, 15, 19, 20, 21, 22	.82
Decision-Making Knowledge: Items dealt with the decision-making process, from understanding influences involved in decisions (e.g., ethical factors or personal limitations) to the outcomes of decisions (e.g., setbacks or conflicts).	4, 5, 7, 8, 10	.74
Attitude Components and Description	**Items**	**Alpha**
Attitude Toward Tools for Collegiate Success: Items related to general tools for academic or collegiate success including issues of diet and exercise.	1, 2, 3, 9, 16, 17, 18, 19, 20, 21	.93
Attitude Toward Interactions: Items pertained to interactions one might experience on campus and the influences critical in those interactions.	4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 22	.92
Behavior Components and Description	**Items**	**Alpha**
Academic Behaviors: Items pertained to academic issues (e.g., note-taking, academic goal setting, and school effort).	1, 2, 3, 8, 13	.80
Decision Behaviors: Items related to the decision-making process, from understanding influences involved in decisions (e.g., ethical factors) to the outcomes of decisions (e.g., setbacks or conflicts).	4, 5, 6, 7	.74
Conscientious Behavior: Items pertained to issues of appropriate behavior in differing circumstances (e.g., health-related, social, or academic).	9, 10, 11, 12, 14	.61
Proactive Behavior: Items reflected initiatives that students undertake in order to facilitate health related and interpersonal well-being.	15, 16, 17, 18	.71

***Note*. Cronbach's Alpha used as the estimate of reliability.**

Table 4

Means and Standard Deviations for Student Group on Component Variables

	Student Group					
	FYE (n = 677)			Comparison Group (n = 236)		
	Unadjusted Mean	Adjusted Mean	*SD*	Unadjusted Mean	Adjusted Mean	*SD*
Knowledge of Resources	4.04	4.04	.63	3.88	3.86	.71
Knowledge of Academic Skills	3.93	3.94	.68	3.98	3.94	.72
Knowledge of Health and Wellness	4.24	4.24	.57	4.22	4.20	.63
Decision Making Knowledge	3.98	3.99	.60	4.02	4.00	.62
Attitudes Toward Tools for Collegiate Success	4.50	4.48	.53	4.40	4.38	.54
Attitudes Toward Interactions	4.25	4.23	.56	4.11	4.10	.59
Academic Behaviors	4.21	4.19	.67	4.19	4.16	.71
Decision Behaviors	4.15	4.15	.64	4.18	4.16	.64
Conscientious Behavior	4.23	4.20	.60	4.20	4.22	.56
Proactive Behavior	4.04	4.04	.74	3.99	4.02	.72

Table 5

Means and Standard Deviations for Gender on Component Variables

	Gender					
	Female (n = 606)			Male (n = 307)		
	Unadjusted Mean	Adjusted Mean	*SD*	Unadjusted Mean	Adjusted Mean	*SD*
Knowledge of Resources	4.04	3.98	.62	3.92	3.92	.71
Knowledge of Academic Skills	3.99	3.99	.67	3.85	3.89	.73
Knowledge of Health and Wellness	4.26	4.25	.56	4.18	4.19	.63
Decision Making Knowledge	4.01	4.01	.58	3.96	3.95	.65
Attitudes Toward Tools for Collegiate Success	4.56	4.51	.47	4.32	4.34	.60
Attitudes Toward Interactions	4.29	4.23	.52	4.07	4.10	.62
Academic Behaviors	4.32	4.26	.59	3.98	4.09	.80
Decision Behaviors	4.21	4.19	.59	4.07	4.13	.72
Conscientious Behavior	4.27	4.21	.56	4.13	4.21	.63
Proactive Behavior	4.05	4.02	.72	3.99	4.04	.76

sible violation to normality. Specifically, Knowledge of Health and Wellness and Attitude Toward Tools for Collegiate Success were found to have skewness and kurtosis statistics in excess of twice their respective standard errors. Although Stevens (1996) suggested several options for transforming variables to achieve normality, interpretation of these variables is difficult, at best. Although normality usually enhances a multivariate solution, it is not always required for analysis (Tabachnick & Fidell, 1996). In this case, all of the variables followed similar trends. These trends may be explained by the fact that most participants' self-report scores on the Likert-type scales are high and scores are somewhat homogenous (i.e., negatively skewed and leptokurtic). Regardless, all inferences should be interpreted with caution.

Design

This study followed a quasi-experimental, nonequivalent comparison group design. To address the research questions, a doubly multivariate, repeated measures analysis of variance was applied to the data. This approach was selected because: (a) Participants' responses were measured at two times (prior to instruction and after instruction at the conclusion of the semester); (b) multiple measures were administered on each occasion; and (c) there are two sets of groups involved in this analysis (i.e., student group and gender). For this analysis, time served as the within-subjects factor while both student group and gender served as between-subject independent variables. The 10 derived component scale scores served as the dependent variables in the analysis (see Appendix B for the intercorrelation matrix).

Results

Research Question One: Student Group

Between-subjects analysis revealed a significant main effect for student group, Wilks' $\Lambda = .973$, $F(10, 892) = 2.465$, $p = .007$,

partial η^2 = .027. Follow-up tests revealed differences on one variable, Attitudes Toward Interactions, F (1, 901) = 4.433, p = .036, partial η^2 = .005. However, while the main effect and follow-up test were statistically significant, the estimate of the effect size was low (Cohen, 1988). This suggests that although there is statistical significance, there is limited practical significance associated with these findings.

To further explore the relationship between the FYE and comparison group over time, the interaction was examined. Analysis revealed a significant interaction over time with respect to student group, Wilks' Λ = .970, F (10, 892) = 2.733, p = .003, partial η^2 = .030. Follow-up tests revealed differences on two variables, Knowledge of Resources, F (1, 901) = 11.979, p = .001, partial η^2 = .013, and Attitudes Toward Interactions, F (1, 901) = 4.773, p = .029, partial η^2 = .005. For Knowledge of Resources, follow-up analyses of the simple effects were conducted using the estimated marginal means and revealed a significant change in scores over time for both the FYE and comparison groups (see Table 6). However, although there was no significant difference between groups' responses during the pretest, there was a significant difference between groups' responses in favor of the FYE group during the posttest (see Table 7). While both groups' scores increased overall, there was a larger positive change with respect to the FYE group. Figure 1 portrays the profile plot for this interaction.

For Attitude Toward Interactions, follow-up analyses of simple effects revealed a change in scores over time for the comparison group only (see Table 6). Further, although there was no significant difference between groups at pretest, there was a significant difference at posttest (see Table 7). Evaluation of estimated marginal means and the profile plots (see Figure 2), indicated that the comparison group's scores on Attitude Toward Interactions decreased significantly while the FYE group's scores remained relatively unchanged. However, the estimate of effect size for this follow-up test was also low. This implies caution when drawing practical inferences from this statistic.

Table 6

Student Group Pairwise Comparisons Over Time

Variable	Student FYE Grouping	Mean Difference (Pretest-Posttest)	Standard Error	Significance
Knowledge of Resources	FYE	-.328	.033	< .001
	Comparison	-.116	.053	.030
Attitude Toward Interactions	FYE	.043	.027	.114
	Comparison	.154	.044	< .001

***Note*. Bonferroni adjustment used for multiple comparisons. Analysis based on Estimated Marginal Means.**

Table 7

Pairwise Group Comparisons on Different Occasions

Variable	Time	Mean Difference (FYE-Comparison)	Standard Error	Significance
Knowledge of Resources	Pretest	-.061	.053	.249
	Posttest	.152	.049	.002
Attitude Toward Interactions	Pretest	.021	.046	.648
	Posttest	.132	.042	.002

***Note*. Bonferroni adjustment used for multiple comparisons. Analysis based on Estimated Marginal Means.**

Research Question Two: Gender

Between-subjects analysis revealed a significant main effect with respect to gender, Wilks' $\Lambda = .880$, $F(10, 892) = 12.167$, $p < .001$, partial $\eta^2 = .12$. Test of between-subject effects with student group averaged revealed differences on each dependent variable with the exception of Proactive Behavior. Table 8 presents the univariate tests for this main effect. Although there were many differences between the ways males and females responded to

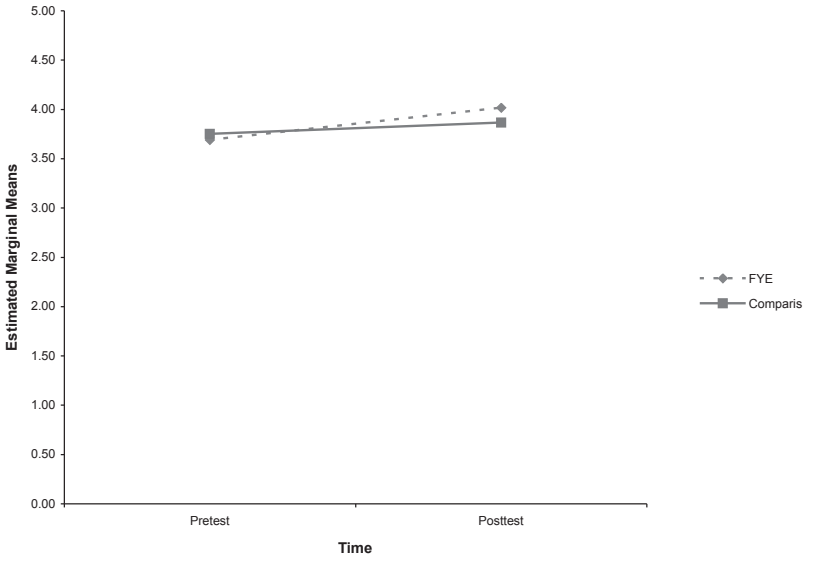

Figure 1. Estimated marginal means for *Knowledge of Resources*. Students enrolled in the FYE course reported significantly higher scores at posttest.

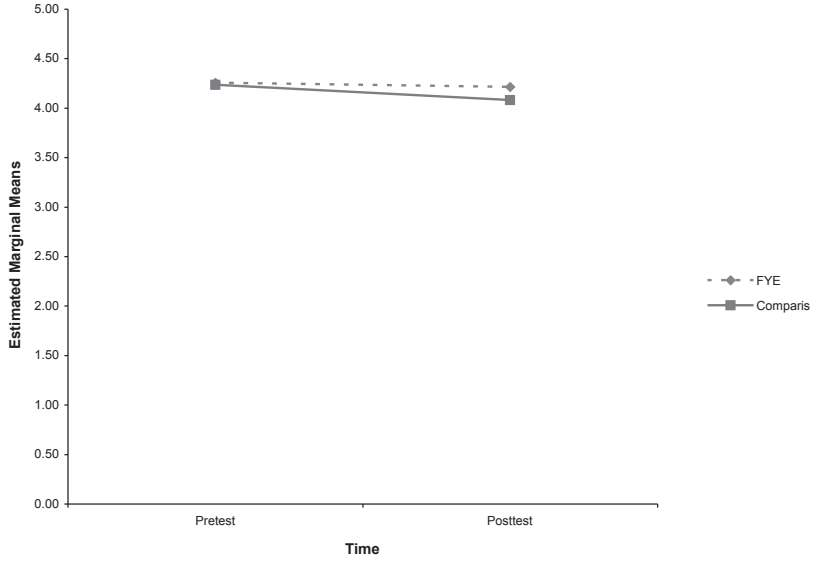

Figure 2. Estimated marginal means for *Attitudes Toward Interactions*. Students in the comparison group exhibit a significant decline in their ratings.

Table 8

Univariate Tests of Gender (n = 904)

Variable	Mean Square	F (1, 901)	Sig.	Partial η^2
Knowledge of Resources	2.721	9.441	.002	.010
Knowledge of Academic Skills	6.357	20.390	< .001	.022
Knowledge of Health and Wellness	1.683	6.752	.010	.007
Decision Making Knowledge	1.084	4.282	.039	.005
Attitudes Toward Tools for Collegiate Success	9.470	44.884	< .001	.047
Attitude Toward Interactions	9.223	40.334	< .001	.043
Academic Behaviors	21.236	71.619	< .001	.074
Decision Behaviors	2.388	8.525	.004	.009
Conscientious Behavior	2.620	13.607	< .001	.015
Proactive Behavior	.681	1.951	.163	.002

***Note*. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.**

the KAB battery, the interaction between time and gender was not significant. This suggests that although responses differ on average, those differences are stable over time.

Discussion

The first year of college presents a variety of challenges for students and faculty. The literature indicates that a wide range of issues, from social to individual factors, influence students' success during their first year. It follows that FYE programs are challenged to provide experience and instruction across this chasm of ideas (White et al., 1995). Because the variability of topics and student needs is so diverse, evaluating the effect of FYE programs is highly complex and involves a large number of variables. As a result, the current study focused on a small subset of the possible variables that contribute to student success. The results of this investigation do not necessarily support the value

of the FYE program, especially given the nonrandom nature of the assignment variable.

When interpreting the results of this investigation, one must consider the importance of effect size in relation to practical and statistical significance (Cohen, 1988). The data from this investigation do not support the conclusion that the FYE is valuable in terms of its programmatic objectives. Although there are many statistically significant differences between groups, the effect sizes of these differences are small. Therefore, one cannot conclude that the FYE program is effective. However, Cohen used the concept of practical significance to promote judicious and meaningful interpretation of research results. As such, we acknowledged the practical limitation associated with these findings but suggest that there is a link between being in the FYE program and learning. Unfortunately, the self-selected nature of participation in the FYE program also potentially confounds the results of the study. As a result, we are unable to suggest programmatic change or courses of action based on these data. Nevertheless, we assert that the trends are found in areas of considerable interest and provide grounds for future investigations.

Statistically, there are significant results associated with the way students report their Knowledge of Resources; students in the FYE group demonstrated greater gains over time. Further, students engaged in an academic experience without FYE instruction did not exhibit such gains. Similarly, researchers have asserted the importance of resource awareness (Crismore, 1984; Terenzini & Reason, 2006) and argued that student acclimation to the facilities, support services, and other resources is a principal goal of the FYE program (Barefoot & Gardner, 1993; Howard & Jones, 2000). Because differences exist in an area of considerable interest, trends apparent in these data should be examined in greater detail in future investigations.

While less straightforward, results associated with Attitudes Toward Interactions revealed other notable differences. With respect to this variable, the FYE group remained relatively stable with only a slight decline in their ratings while the scores for the comparison declined significantly. A principal goal of FYE pro-

grams is to establish a social cohort early in students' academic careers and provide information about interactions with other individuals as well as various university systems (e.g., financial aid, counseling, health). Without this experience, students appear to lower their appraisal of these important resources. Unfortunately, the reason for this decline in the general population is not known. Similarly, it is unclear whether the FYE program is effective in staving off any significant decline in these attitudes.

Given the model of departure provided by Tinto (1987), we find this attitudinal trend particularly disconcerting. In Tinto's model, the decision to persist with secondary education is longitudinal. Over time, students' interactions with the system and other individuals continually inform their evaluation to stay or leave (Tinto, 1987). One might infer from this model that students with lower attitude ratings might be subject to increased risk of departure. Also with respect to attitudes, literature suggests that there is a link between attitude and behaviors (e.g., Ajzen, 1993; Bandura, 1997). Influencing attitudes is also a component of long-term behavioral change (Lawless, Brown, & Cartter, 1997; Schrader & Lawless, 2004). In terms of academic and life-skills, attitude-driven improvements in behavior could lead to other important improvements such as graduation rates, GPA, or personal satisfaction. Unfortunately, the data reported here are insufficient to support claims about retention or performance without additional research into these links and possible outcomes of the FYE program.

Results also indicated that there are several differences in the ways males and females respond to the KAB battery. On average, females report higher ratings in every area addressed by the FYE program with the exception of Proactive Behavior. Even though the effects are small, they range across important areas within the FYE program (e.g., Knowledge of Resources). Although the results did not suggest an interaction between gender and student group over time, further analysis of gender and initial group membership indicates that students elect to participate in the FYE at different rates (Pearson Chi-Square, $p = .009$). A greater proportion of females enrolled in the FYE program. Considering

the positive influence of the FYE program and apparent gender differences, greater and more focused recruitment efforts targeting males might be examined in future research.

Although the effects of these results do not justify strong inferences from the data, we do not discount the potential positive influence of the FYE program. Further, limitations of this investigation and design may account for the small effect sizes. A major limitation is selection bias. Participants were not randomly assigned to the FYE and comparison group conditions. Rather, they elected to participate in the FYE program. Due to university policies, this will likely remain the case in the future. However, replication of this study in a university that could randomly assign freshman to the FYE or control condition would provide a great deal of insight about the effect of the FYE program on knowledge, attitudes, and behaviors. Statistical normality presented a problem for some of the variables. Although multivariate tests do not always require normality among the variables (Tabachnick & Fidell, 1996), the results need to be interpreted with caution. Additionally, this study was conducted over a single semester, which is a relatively brief span of time. It is difficult to conclude that a single credit course exhibits strong and lasting influences over knowledge, attitudes, and behaviors. Additional investigations are encouraged to examine the influence of FYE programs over greater periods of time. Collectively, these issues may have limited our ability to measure and evaluate real, meaningful differences associated with the FYE.

In response to these limitations, we suggest several topics for consideration and ways to improve future research associated with the FYE program. For example, a significant portion of the FYE program was focused on academic skills. Thus, the application of academic skills serves as a powerful metric by which a program may be evaluated. Future research is encouraged to connect the results to performance in postsecondary education during the first year and beyond. Further, the overall success of an FYE program is measured only partially in terms of learning and performance. In this case, one of the most powerful metrics concerning the FYE program would be whether or not it con-

tributes to the retention of students and graduation rates of the participants. Future research connecting the work on FYE programs and graduation rates is recommended. Because the FYE is designed to be an integral part of the collegiate experience, these should be examined as long-term outcomes of FYE programs. Researchers could also expand the scope and investigation of the FYE program at the institutional, procedural, and policy level. In particular, it would be valuable to know what policy decisions and institutional supports promote the most successful and comprehensive FYE programs. Continuing these lines of research will contribute to our understanding of college students' first-year experience.

Conclusion

This investigation was focused on implementing a comprehensive evaluation of the FYE program at a large Northeastern university. Due to the inherent complexity of the program, the evaluation was designed to measure the FYE programmatic objectives. These objectives pertained to academic and life skills, particularly those associated with knowledge. By using the KAB battery, it was possible to observe changes in many of the factors associated with the FYE course. Specifically, the FYE group rated their Knowledge of Resources significantly higher than members of a comparison group. They also maintained a somewhat consistent rating pertaining to their Attitudes Toward Interactions while the control group's scores declined. However, the effects of these findings were small and the data from this study did not demonstrate robust positive effects for the FYE course.

Although it is premature to conclude that the FYE program is effective as measured by the KAB battery, it is equally premature to conclude that it is ineffective. Regardless, it is likely that FYE interventions and other institutional supports will continue. Research indicates that the development of student performance and the mitigation of attrition are high-stakes issues in secondary education. Students who do not successfully integrate

into the academic environment represent a loss of resources in terms of student talent and revenue. FYE programs like the one described are one aspect of universities' solution to the problem. Institutions are heavily invested in programs like the FYE in terms of resources, time, and effort.

Although the differences reported here may not be strong enough to support actionable changes, they do suggest areas for future investigation. There appear to be unresolved issues associated with males and females in terms of their participation in the FYE program as well as their responses to the program. According to the data, females generally rated their scores higher than males. Moreover, males tend to opt out of the FYE course more often than females. This is a discouraging trend. Future investigations should examine these issues specifically. Only then would one be capable of recommendations, like altering recruitment strategies or even participation policy (i.e., requirements). Presently, these data and results are only suggestive of such issues.

It is important to remember that FYE programs are intended and designed to benefit first-year students in a wide variety of ways. Ultimately, these programs are developed to prepare students to engage in high-level academics and to be successful in college (Carter et al., 2006; Ellis, 2003; VanderStoep & Pintrich, 2008; White et al., 1995; Wratcher, 1991). This particular FYE program combines a variety of objectives and instructional approaches to facilitate student development. While these findings are not conclusive in terms of their advocacy for the FYE, the trends suggest a link between the FYE and important programmatic outcomes. Although additional studies are necessary, students ultimately stand to benefit from this research and efforts that follow.

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Appendix A:
The University Experience Battery Items

Knowledge Scale						
Directions: *Indicate your responses to the following statements in reference to your* knowledge *using the following key. Circle the appropriate response.*	*SD = Strongly disagree* *SA = Strongly agree*	*SD* 1	2	3	4	*SA* 5
1. I know how to effectively focus my effort on my schoolwork.		1	2	3	4	5
2. I know what it takes to manage my time effectively.		1	2	3	4	5
3. I know how to stay motivated in school.		1	2	3	4	5
4. When making a decision, I know how to consider ethical factors and implications.		1	2	3	4	5
5. I know how to avoid rash, spontaneous decision-making.		1	2	3	4	5
6. I am aware of the University counseling and support services.		1	2	3	4	5
7. I know how to effectively cope with academic stresses and setbacks.		1	2	3	4	5
8. I know how to resolve conflicts responsibly.		1	2	3	4	5
9. I know how to develop long term academic goals.		1	2	3	4	5
10. I am aware of my own personal limitations.		1	2	3	4	5
11. At the University, I know who to go to when medical issues arise.		1	2	3	4	5
12. I know how to use the library's electronic resources to help with my courses.		1	2	3	4	5
13. When deciding which courses to take, I know who to talk to for help.		1	2	3	4	5
14. I know how to act responsibly when confronted with issues of a sexual nature.		1	2	3	4	5
15. I know of the different signs of illicit drug use in my peers.		1	2	3	4	5
16. I know how to take good notes in class.		1	2	3	4	5
17. I know how to use computers for my courses		1	2	3	4	5
18. I know the sequence of courses I have to complete in order to graduate on time.		1	2	3	4	5
19. I know the value of a healthy diet.		1	2	3	4	5
20. I know it is important to exercise weekly.		1	2	3	4	5
21. I know how to solve problems.		1	2	3	4	5
22. I know how to work in groups.		1	2	3	4	5

Attitude Scale						
Directions: *Indicate your responses to the following statements in reference to your* attitude *using the following key. Circle the appropriate response.*	*SD = Strongly disagree* *SA = Strongly agree*	*SD* 1	2	3	4	*SA* 5
1. Focusing my effort on my schoolwork is important to me.		1	2	3	4	5
2. I believe effective time management is a useful tool.		1	2	3	4	5
3. I believe that my motivation for school is important.		1	2	3	4	5
4. When making a decision, I should consider ethical factors and implications.		1	2	3	4	5
5. I should avoid rash, spontaneous decision-making.		1	2	3	4	5
6. I believe it is important to use the University's counseling and support services.		1	2	3	4	5
7. It is important to effectively cope with academic stresses and setbacks.		1	2	3	4	5
8. I should always resolve conflicts responsibly.		1	2	3	4	5
9. I should work towards my long term academic goals.		1	2	3	4	5
10. It is important to understand my personal limitations.		1	2	3	4	5
11. It is important to meet with the appropriate University personnel when medical issues arise.		1	2	3	4	5
12. It is important to use the library's electronic resources to help with my coursework.		1	2	3	4	5
13. I should talk to someone to help decide which courses to take.		1	2	3	4	5
14. It is important to act responsibly when confronted with issues of a sexual nature.		1	2	3	4	5
15. Being able to recognize the signs of illicit drug use in my peers is important.		1	2	3	4	5
16. Good note taking skills are important.		1	2	3	4	5
17. Learning how to use computers for my courses is important.		1	2	3	4	5
18. It is important to complete courses when recommended time in order to graduate on time.		1	2	3	4	5
19. I believe it is important to maintain a healthy diet.		1	2	3	4	5
20. I should exercise weekly.		1	2	3	4	5
21. I believe it is important to solve problems.		1	2	3	4	5
22. I believe it is important to work in groups.		1	2	3	4	5

Behavior Scale							
Directions: *Mark the frequency that you perform each of the* behaviors *listed below by circling the appropriate responses using the following key.*	**NA** = Not Applicable **N** = Never **R** = Rarely **S** = Seldom **O** = Occasionally **F**= Frequently	**NA** 0	**N** 1	**R** 2	**S** 3	**O** 4	**F** 5
1. I effectively focus my effort upon my schoolwork.		0	1	2	3	4	5
2. I manage my time effectively.		0	1	2	3	4	5
3. I stay motivated in school.		0	1	2	3	4	5
4. When making a decision, I consider important ethical factors and implications.		0	1	2	3	4	5
5. I pause and think before I make a decision.		0	1	2	3	4	5
6. I effectively cope with academic stresses and setbacks.		0	1	2	3	4	5
7. I resolve conflicts responsibly.		0	1	2	3	4	5
8. I strive towards my long term academic goals.		0	1	2	3	4	5
9. I work within my personal limitations without taking on too much.		0	1	2	3	4	5
10. When medical issues arise, I go (or will go) to the appropriate University personnel.		0	1	2	3	4	5
11. When confronted with issues of a sexual nature, I act responsibly.		0	1	2	3	4	5
12. I can recognize the signs of illicit drug use.		0	1	2	3	4	5
13. I take good notes in class.		0	1	2	3	4	5
14. I use computers to work on my course assignments.		0	1	2	3	4	5
15. I maintain a healthy diet.		0	1	2	3	4	5
16. I exercise weekly.		0	1	2	3	4	5
17. I solve problems.		0	1	2	3	4	5
18. I work in groups.		0	1	2	3	4	5

Appendix B
Intercorrelation Matrix for the Dependent Variables (n = 931)

	Intercorrelations									
Variable	1	2	3	4	5	6	7	8	9	10
1. Knowledge of resources	-									
2. Knowledge of academic skills	.48	-								
3. Knowledge of health & wellness	.62	.60	-							
4. Decision making knowledge	.55	.65	.63	-						
5. Attitude toward tools for collegiate success	.48	.47	.62	.47	-					
6. Interaction attitudes	.53	.39	.54	.49	.80	-				
7. Academic behaviors	.35	.64	.39	.42	.49	.41	-			
8. Decision making behaviors	.41	.49	.46	.60	.44	.49	.65	-		
9. Conscientious behavior	.53	.42	.52	.46	.50	.54	.57	.64	-	
10. Proactive behavior	.34	.40	.51	.34	.40	.37	.47	.47	.50	-

Note. All correlations are significant at the 0.01 level (2-tailed).