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Developing Social and Personal Competence in the First Year of College

*Robert D. Reason, Patrick T. Terenzini,
and Robert J. Domingo*

The available research on first-year college outcomes remains highly segmented (Pascarella & Terenzini, 2005) and surprisingly incomplete (Upcraft, Gardner, Barefoot, & Associates, 2005). Although research has established the importance of the first year of college for students' learning and cognitive development (Osterlind 1996, 1997; Pascarella & Terenzini, 2005), the importance of the first college year in influencing the development of the psychosocial outcomes for students is much less clear. Although one might logically conclude that the first college year is essential as the foundation for growth in both cognitive and psychosocial areas, little empirical evidence is available to support such a conclusion with respect to psychosocial change.

One construct related to psychosocial development, "social and personal competence," has received some attention from higher education researchers, particularly those using data from the National Survey of Student Engage-

ROBERT D. REASON is Assistant Professor and Research Associate, PATRICK T. TERENZINI is Distinguished Professor and Senior Scientist, and ROBERT J. DOMINGO is a doctoral candidate, all at the Center for the Study of Higher Education at The Pennsylvania State University. Address queries to Robert D. Reason, 400 Rackely Building, Penn State University, University Park, PA 16802; telephone: (814) 863-3766; fax: (814) 865-0543; email: rreason@psu.edu.

ment (NSSE; Kuh, 2001). Along with a measure related to cognitive/academic development, this measure of social/personal development has emerged consistently as a robust, albeit self-reported, outcome measure (Kuh, 2001; Kuh et al., 2001). Filkins and Doyle (2002), Zhao and Kuh (2004) and others have used this "social and personal competence scale" (with a few minor deviations) as an outcome measure in studying first-year college students.

Several common findings have emerged from studies using measures of social and personal competence as a first-year outcome. These studies highlighted the connection between students' sense of support at an institution and their reports of increases in their social and personal competence (Belcheir, 2001; Filkins & Doyle, 2002; Zhao & Kuh, 2004). Filkins and Doyle, in a study of 1,910 students at six urban institutions, found that students' ratings of institutional support were the strongest predictors of gains in social and personal development. Similarly, in a study of the impact of learning community participation that included more than 38,000 first-year students, Zhao and Kuh (2004) attributed the larger change in social and personal competence reported by learning community participants, in part, to the greater support these students reported. Findings from these two studies are consistent with the findings from a single-site study of 1,000 students by Belcheir (2001).

Although one might assume that students' social and personal competence is shaped largely by their out-of-class activities, research reveals that changes in these areas are also attributable to the courses students take, their experiences within their courses, and the academic majors they choose (Pascarella & Terenzini, 2005). Nelson Laird, Shoup, and Kuh (2005) found that students who participated in "deep learning" activities—those requiring higher-order cognitive skills, the integration of knowledge across academic areas, and reflection on the learning process—reported greater personal and intellectual development than did students with less exposure to such activities. Zhao and Kuh (2004) also attributed development in social and personal domains to the deeper levels of academic engagement required of learning community participants. Finally, Belcheir (2001) found that students who reported greater social and personal development were also more likely to report high faculty expectations, writing multiple drafts of academic papers, and participating in community-based projects as part of coursework. Although causal relationships cannot be claimed, the effects of students' academic experiences appear to be strong, even in the face of controls for other factors (Pascarella & Terenzini, 2005).

Although these studies provide guidance for our understanding of how the first year of college influences the social and personal development of students, many issues remain. The studies are generally narrow in scope, focusing on one educational intervention (Zhao & Kuh, 2004) or comparisons of limited types of students (Filkins & Doyle, 2002). Similarly, Nelson Laird

and his colleagues (2005) were particularly focused on differences between academic disciplines in which students were majoring. Thus, while useful, none of these studies (individually or as a whole) provides a comprehensive understanding of the development of social and personal competence in the first year of college.

Using data from nearly 6,700 students and 5,000 faculty members at 30 institutions, our study identifies the individual, organizational, environmental, programmatic, and policy factors that individually and collectively shape first-year students' success—in particular, the development of their social and personal competence. In so doing, we sought to provide a more complete examination of possible influences on student learning outcomes than earlier studies have done.

BACKGROUND ON THE FOUNDATIONS OF EXCELLENCE PROJECT

The study was part of the Foundations of Excellence[®] in the First College Year Project (<http://www.fyfoundations.org>), a two-year national research and development effort to increase understanding of the multiple, interconnected factors that influence academic success and persistence among first-year college students. Foundations Project staff view the first year as a significant period in students' academic and personal lives and seek to facilitate a transformation in the way colleges and universities think about, package, and present the first year of college to their new students.

Foundational Dimensions and the Underlying Literature

Relying on the research published over the past 35 years (e.g., Pascarella & Terenzini, 1991, 2005) and on professional experience, project staff¹ distilled seven principles, called “Foundational Dimensions[®],” that underlie the structures, activities, and cultures of institutions that are effective in promoting the success and persistence of their first-year students. The original dimension statements were subsequently refined in a broad series of campus-based discussions among faculty members and administrators on nearly 200 liberal arts and comprehensive university campuses. The dimensions state that institutions with effective first years:

1. Have organizational structures and policies that provide a comprehensive, integrated, and coordinated approach to the first year. Studies of institutional-level effects on student outcomes indicate that personal and organizational environments and cultures are more influential forces than

¹ Foundations of Excellence project members contributing to this phase included John N. Gardner, Betsy O. Barefoot, Robert D. Reason, Stephen W. Schwartz, Randy L. Swing, Patrick T. Terenzini, M. Lee Upcraft, and Edward Zlotkowski.

such structural characteristics as size, control, mission, and selectivity (see, for example, Berger, 2000, 2001–2002, 2002; Berger & Milem, 2000). This dimension suggests that institutions vary in important ways in the extent to which they provide structures, policies, and delivery mechanisms that support first-year student success.

2. Facilitate appropriate recruitment, admissions, and student transitions through policies and practices that are intentional and that are aligned with institutional mission. Recent research suggests that the college withdrawal/success process begins far sooner than the first year of college (Terenzini, Cabrera, & Bernal, 2001). Studies of the college search and selection process (Cabrera, Burkum, & La Nasa, 2005; Cabrera & La Nasa, 2001; Hossler, Schmit, & Vesper, 1999) and of the intersection of precollege and post-matriculation factors (Paulsen & St. John, 2002) indicate clear links between what happens *before* students enroll and their subsequent success in college.

3. Assign the first college year a high priority for the faculty. Few college experiences are more strongly linked to student learning and persistence than students' interactions with faculty members. It matters little whether these contacts entail faculty members' pedagogical approaches (Johnson & Johnson, 1995; Qin, Johnson, & Johnson, 1995), interactions in learning communities, or contacts in the broader context of the major department's values and norms (Smart, Feldman, & Ethington, 2000). Such contacts influence changes in the cognitive, psychosocial, and attitudinal domains of students' lives (Berger & Milem, 2000; Volkwein, 1991), as well as their persistence and degree completion (Braxton, Sullivan, & Johnson, 1997).

4. Serve all first-year students according to their varied needs. The scholarly and practical importance of taking differences among students into account has become increasingly apparent in studies of conditional (or interaction) effects. Gender- or race/ethnicity-related conditional effects are reported in students' verbal, quantitative, and subject matter competence (Flowers et al., 1999) and development of higher-order cognitive skills (Flowers, 2000; Terenzini, Springer, et al., 1996). Compensatory effects indicate that grade performance and several first-year experiences are particularly important to the subsequent success of students of color (Zea et al., 1997), low-ability students (Carini, Kuh, & Klein, 2005; Ewell, 2002, 2005), and first-generation students (Pascarella, Pierson, et al., 2004).

5. Engage students, both in and out of the classroom, in order to develop attitudes, behaviors, and skills consistent with the desired outcomes of higher education and the institution's philosophy and mission. Pascarella and Terenzini (2005) concluded that "the impact of college is largely determined by individual effort and involvement in the academic, interpersonal, and extracurricular offerings on a campus. . . . This is not to say that an individual campus's ethos, policies, and programs are unimportant. Quite

the contrary. But . . . it is important to focus on the way in which an institution can shape its academic, interpersonal, and extracurricular offerings to encourage student engagement" (p. 602).

6. Ensure that all first-year students encounter diverse ideas, worldviews, and people as a means of enhancing their learning and preparing them to become members of pluralistic communities. Student encounters with ideas different from those they already hold and with people different from themselves are related to a variety of positive outcomes: increased knowledge acquisition and subject mastery (Johnson & Johnson, 1995; Johnson, Johnson, & Smith, 1996); growth in higher cognitive skill development (Dey, 1991; Terenzini, Springer, et al., 1996); more positive self-concept and self-esteem (Chang, 1999); greater development of interpersonal and leadership skills (Antonio, 2000, 2001; Hurtado, 1997); more inclusive sociopolitical, gender-role, racial/ethnic attitudes; and increased civic and community involvement.

7. Conduct assessments of institutional practices and maintain associations with other institutions and relevant professional organizations to achieve ongoing first-year improvement. Although we know of no studies of links between institutional assessment and student outcomes, logic suggests they might exist. Institutional assessment implies an interest in student learning and in increasing institutional effectiveness.

After reviewing 30 years of research, some of it summarized above, Pascarella and Terenzini (1991, 2005) concluded that multiple forces operate in multiple settings to influence student learning and persistence. They also concluded, however, that with very few exceptions, studies of college effects on students were highly segmented and based on overly narrow conceptual perspectives, concentrating on only a handful of relevant factors at a time. The result, these authors point out, is a body of evidence that "present[s] only a partial picture of the forces at work" (2005, p. 630) in shaping student learning and development.

Our study extends previous research by incorporating, both conceptually and empirically, a broader array of influences than those of the vast majority of studies of college impact. Students change in many ways, but this study focused on the extent to which students developed in their social and personal competence, a psychosocial outcome central to the mission of all colleges and universities.

METHODS

The study undertook a broad examination of students' first-year experiences using a conceptual framework based on the Foundational Dimensions and their underlying research literature. The model is more comprehensive than those typically adopted, including those of the National Study of

Student Learning (Pascarella, Whitt, et al., 1996) and the National Survey of Student Engagement (Kuh, 2001). The study's purpose was not only to explore as completely a range of forces as possible influencing student success in the first college year, but also to identify those features of the college experience that appear to be the primary influences.

Conceptual Framework

Guided by Astin's Input-Environment-Output approach (1993), as well as the model used in the National Study of Student Learning (see, for example, Terenzini, Springer, Pascarella, & Nora, 1995), the conceptual framework adopted for this study hypothesizes that students come to college with a range of demographic, personal, and academic characteristics and experiences. These traits shape students' engagement with various aspects of their institution, including their curricular, classroom, and out-of-class experiences and conditions. All of these dynamics occur within, and are themselves shaped by, an often-overlooked fourth domain, the institutional context. This context comprises an institution's organizational characteristics, structures, practices, and policies, and the campus's faculty and peer cultures and environments. Figure 1 offers a graphical representation of the conceptual framework that we adopted for this study. That framework grew out of the research literature and provided a sense of order and organization for the Foundational Dimensions described above, with each of the seven Foundational Dimensions accommodated at one or more locations within the conceptual framework.

Figure 1 was developed to guide the study of an array of student learning outcomes and persistence (Terenzini & Reason, 2005). The outcome variable(s) portion of the model can be understood to contain any of a broad assortment of student outcomes, including cognitive development, psychosocial and attitudinal change, and persistence. This study, however, focuses on only one of those college outcomes—students' development of social and personal competence. The framework implies that growth in this area is primarily a function of student engagement in three particular venues: the curriculum (e.g., the courses taken and major field of study), the classroom (e.g., pedagogical approaches, classroom activities, and instructor attitudes), and the student's out-of-class activities. Generally, more active student involvement in the curricular and co-curricular experiences of college is hypothesized to lead to greater growth (Astin, 1993; Kuh, 2001).

The individual student experience, however, does not occur in discrete pieces or in isolation from other components of the overall college experience. Astin (1993), for example, concluded that "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (p. 398). As implied in Figure 1, this study treats the peer environment as a central mediating force, affecting how, and how much, students change during college.

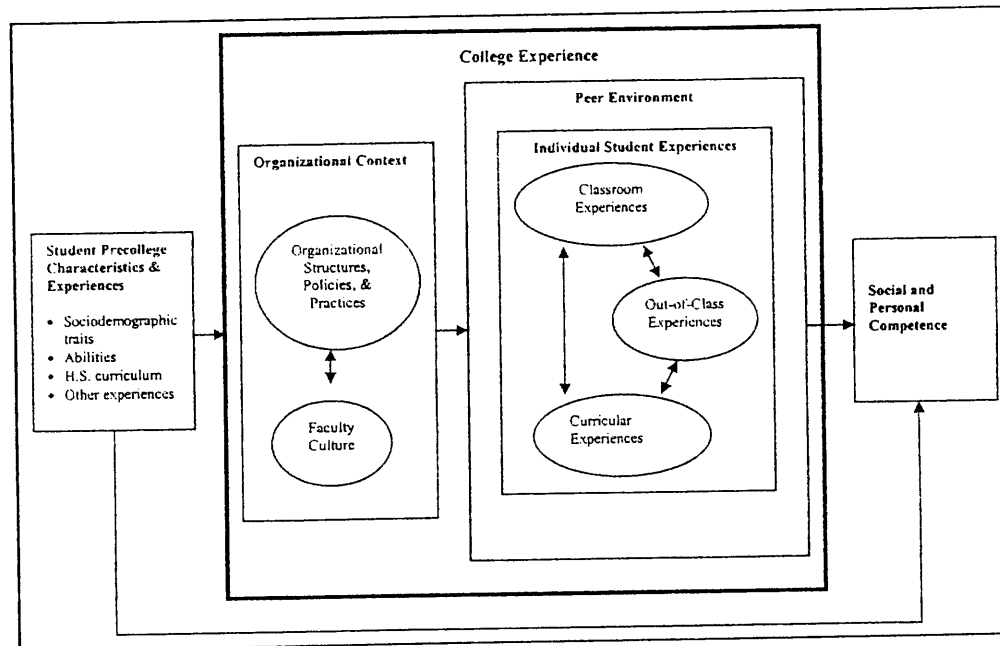


Figure 1. Comprehensive model of influences on student learning and persistence.

Although students' level of engagement is typically treated as an individual characteristic or as an aggregate (the peer environment), both influences exist within a still larger setting—the organizational context—which is frequently overlooked in the college impact literature or which is operationalized in terms of such institutional characteristics as type of control, size, mission, or selectivity. Most studies of between-college effects indicate that such variables are too remote from the student experience to have much, if any, effect on student learning (Astin, 1993; Dey et al., 1997; Pascarella & Terenzini, 1991, 2005). Kuh and his colleagues (2005), however, discuss how institution-level policies, practices, and climates can influence student engagement. They also discuss the role that a campus's "ethos"—or the institution's system of values—plays in mediating student engagement and, consequently, student learning.

Finally, this study's conceptual framework acknowledges that students' social and personal competence is shaped to some degree by students' precollege characteristics. These personal and academic backgrounds and experiences both prepare students for, and dispose them, in varying degrees, to engage with the learning opportunities their institution offers. In the aggregate, moreover, these characteristics and dispositions can be understood to reflect the peer environment. Because of our study's focus on aspects and components of the first-year experience that influence students' development of social and personal competence (and over which faculty members

and administrators have some degree of policy or programmatic control), we treat students' precollege experiences as control variables.

Design, Population, and Sample

Because of time and resource constraints, the study adopted a cross-sectional, *ex post facto* survey design. Although a longitudinal design would have been preferable, Astin (1993) has suggested that college impacts can also be estimated from the "intensity" of student exposure to various college influences. For example, students at institutions with a more effective constellation of first-year programs, services, and experiences would be expected to develop higher levels of social and personal competence than similar students at less effectively organized or focused institutions.

Operationally, the target population included first-year students who were entering institutions belonging to the Council of Independent Colleges (CIC) or to the American Association of State Colleges and Universities (AASCU). The study relied on an opportunity sample of 24 CIC and AASCU institutions (12 from each sector) selected through a competitive process for participation in the Foundations of Excellence Project. Institutions were chosen based on their willingness and ability to participate in a year-long self-study of their first-year experience, not on the current effectiveness of their first-year offerings. The initial sample of 24 institutions was augmented by six additional institutions (4 AASCU and 2 CIC) that elected to participate in the data collections at their own expense.

Following the study's conceptual framework, project staff gathered information from both students and faculty members. The student population consisted of those first-year students eligible for sampling as part of their institution's participation in the National Survey of Student Engagement. Data in this study come from 6,687 full- and part-time, first-year students on the 30 participating campuses. Individual student response rates within institutions ranged from 13% to 66%, with an average institutional response rate of 38%. The response rate for the overall sample was 33%. Because demographic information for the target first-year population on each campus was unavailable, the representativeness of the sample remains unknown. Although the use of random sampling procedures by NSSE provides some level of confidence in the representativeness of the sample, the low response rates and lack of specific demographic information for the population remain potential threats and must be considered when interpreting these results.

We defined as eligible faculty members as all tenured, tenure-track, and non-tenure-track instructional staff of all ranks (i.e., professor, associate professor, assistant professor, instructor, or lecturer), regardless of their full- or part-time status. This population definition excluded faculty members teaching in programs that served only graduate students, who taught only evening or continuing education division courses, or who held adjunct,

clinical, or emeritus titles. In most cases, the entire faculty population (as defined) at a campus was invited to participate. At institutions where the size of the faculty prohibited a census, we drew a simple random sample of faculty. Of the 11,282 faculty members contacted, we received usable responses from 5,024 (a 45% response rate). Respondents from each institution were weighted to be representative of all faculty members at that institution with respect to gender, employment status (F/PT), and academic rank. We also assigned weights to adjust for differing response rates across institutions within each institutional sector.

Data Collection Procedures

As a condition of participation in the overall Foundations of Excellence Project, institutions were required to take part in the 2003 or 2004 National Survey of Student Engagement (NSSE). Adoption of NSSE as one of two primary data collection instruments not only provided extensive information on students' experiences and outcomes, but also helped minimize study costs. NSSE provides information on first-year academic and nonacademic experiences known to influence performance and persistence, as well as self-reported gains in various educational outcomes (Kuh, 2001).

We designed and administered questionnaires to gather information from faculty members on their characteristics, pedagogical preferences, professional activities, and perceptions of their campus's approach to the first year of college. The Foundational Dimension statements, along with the study's conceptual framework guided the development of items and scales. The Pennsylvania State University Survey Research Center undertook the data collection, using both paper and web-based instruments with four waves of contacts. The chief academic officers on each campus also wrote to faculty members encouraging their participation.

Variables

Project staff gathered data on a large number of predictor variables and scales developed to operationalize the four sources of influence on student learning as delineated in the conceptual framework: students' precollege characteristics and experiences; the institution's organizational structures, policies, and practices; students' experiences during their first year (and, in the aggregate, the peer environment); and the faculty culture.

Control variables. The study controlled for entering students' sex, race/ethnicity (White/non-White), age, entry status (native/transfer), enrollment status (full-/part-time), residence (on/off campus), academic major, parental education, and the year the NSSE was completed. Because of the relatively small number of students in each historically underrepresented racial/ethnic category, we collapsed the race/ethnicity variable into the dichotomous categories of White and non-White. Although necessary for

meaningful statistical analyses, this practice limits the power of findings to uncover differences between or among different racial/ethnic groups.

We also included controls for institutional sector (AASCU/CIC) and degree of urbanicity (rural/suburban/urban). Because of its high correlation with other conventional institutional characteristics, sector served as a reasonable proxy for institutional size, type of control, mission, and Carnegie Classification.

Independent variables of primary interest. Project staff developed a set of measures of institutional performance on each of the Foundational Dimensions listed earlier. Performance indicators were factorially derived scales developed separately from both the faculty and student responses. These performance-indicator scales were derived in a series of principal components analyses (with varimax rotations) of relevant sets of items. Only components loading .40 or higher were retained; we excluded items (with one or two exceptions) loading above .40 on two or more factors. We developed scale scores for both student and faculty scales by summing a respondent's scores on the component items and dividing by the number of items in the scale (Armor, 1974). Where items in the same scale had different metrics, scores on all items within the scale were converted to z-scores to put all items on a common metric, then added a constant of 10 to eliminate negative z-values. We then averaged the resulting standardized scores to form a scale score. Table 1 provides psychometric information for each of the 20 faculty-based and 7 student-based scales. We did not retain all student- or faculty-based performance indicators for the final analytical model.

The left-hand portion of Table 1 lists the 20 scales factorially derived from the Faculty Survey (designed specifically for this project) to operationalize all seven of the Foundational Dimensions. As can be seen in the table, each dimension has between two and five faculty-based scales reflecting institutional performance on those dimensions with the exception of the Diversity dimension, which has only a single performance indicator. The internal consistency reliabilities (Cronbach's alpha) of these scales are generally high: only four of the 20 scales have alphas below the standard .70 level, and eight of the scales have alphas of .80 or higher. Fourteen of the 20 scales have alphas of .75 or higher.² Because of the need to rely on NSSE, a secondary data source, and because NSSE was designed to measure only student engagement, we could develop student-based performance indicator scales for only three of the seven dimensions. As can be seen in the right-hand portion of Table 1, the alphas for these scales are, overall, moderately reliable. The Co-curricular Engagement scale has little internal consistency

² A complete list of the student- and faculty-based performance indicators and their component items, as well as the Foundational Dimensions* to which each relates, is available from Robert D. Reason.

TABLE 1
FOUNDATIONAL DIMENSIONS AND STUDENT-AND FACULTY-BASED PERFORMANCE INDICATORS

<i>Dimension</i>	<i>Faculty Performance Indicator^a</i>	<i>Scale Alpha</i>	<i>Student Performance Indicator^b</i>	<i>Scale Alpha</i>
1. Organization	Organized Approach (5) ^d Faculty & student affairs cooperation (3)	.89 .86	None	n.a. ^c
2. Transitions	Coherent first year (4) Clarity about offerings (3) Early involvement (4) Setting expectations (2) Preparing faculty (2)	.87 .71 .79 .78 .84	None	n.a.
3. Faculty	Conveying a sense of place (2) Importance of the first year (4) Importance of teaching (2)	.77 .74 .84	None	n.a.
4. All students	Support for faculty (7) Meeting student needs (2)	.86 .76	Supporting all students (5)	.71
5. Engagement	Active teaching (4) Feedback to students (2) Emphasis on writing (3) Community service (2) Passive teaching (2)	.77 .80 .60 .55 .49	Out-of-class engagement (4) Academic engagement (5) Institutional challenge (1) Co-curricular engagement (2) Cognitive engagement (4)	.67 .56 n.a. .25 .82
6. Diversity	Promoting diverse encounters (5)	.81	Diverse interactions (4)	.67
7. Improvement	Assessment for improvement (3) Faculty development (3)	.78 .66	None	n.a.

Table 1, cont.

^a Source: Faculty Survey, Spring 2004

^b Source: 2003 and 2004 responses to the National Survey of Student Engagement

^c Not applicable

^d Number of items comprising the scale

reliability ($\alpha = .25$), probably due, at least in part, to the fact that it contains only two items. The Cognitive Engagement and Supporting All Students scales meet or exceed conventional reliability standards (α s = .82 and .71, respectively). The α s for the scales reflecting students' out-of-class engagement (.67) and encounters with diversity (.67) fall short of the conventional .70 standard by only a very slim margin.

Although the reliabilities for several of the scales (both faculty and student-based) fall below acceptable levels, we remain generally confident of the reliabilities of the factor scores. Stevens (2002) offered a set of guidelines for assessing the reliability of factors derived from the procedure we employed. According to Stevens, these guidelines suggest that factors could be considered reliable if (a) several components loaded above .40 in absolute value and the overall sample size was large or if (b) multiple components loaded .60 in absolute value regardless of sample size. Tabachnick and Fidell (1996) also suggest that overall sample size is directly related to estimates of reliability, with samples over 1,000 generally resulting in reliable factors. The factors created from both the student and faculty data met these criteria for reliability. Finally, the predictive power of a scale provides a certain *prima facie* evidence for reliability: If a scale is a statistically significant predictor of some criterion measure, the scale can be said to have at least some reliability.

Students were the unit of analysis in this study. To operationalize the administrative practices and policies, as well as the faculty environment on each campus, we averaged faculty scores for each scale, then assigned the mean faculty-scale score to each student from that institution. We used these student-based scales in two ways. We computed an individual-level score for each student on each scale to represent the student's experience. The peer environment is represented, for any given campus, as the mean of the scale scores for students on that campus for those dimensions where student-based performance indicators could be developed.

Dependent variable. The dependent variable was a six-item "social and personal competence" scale summarizing first-year students' NSSE-based reports of their institution's impacts on their learning and development in such areas as working with others, understanding self and diverse others, developing personal values and ethics, solving complex real-world problems,

and learning on one's own. Specifically, we asked students to report the "extent [to which] your experience at this institution contributed to your knowledge, skills, and personal development in [those] areas." Students estimated the effects of their college experiences on a four-point scale, where 1 = "very little" and 4 = "very much." The scale was factorially derived and the scale scores were developed using the same procedures described above; the scale has an alpha of .86.

Analytic Procedures

Because this study explored the influence of both individual (Level 1) and organizational (Level 2) characteristics on an individual-level outcome, hierarchical linear modeling (HLM) was the primary statistical procedure we employed (Raudenbush & Bryk, 2002; Tate, 2004). We proceeded in two steps, first estimating preliminary models to identify statistically significant variables within each dimension, followed by a final model which included only statistically significant variables from the preliminary models. For the final model, we followed the iterative hierarchical linear modeling strategy recommended by Raudenbush and Bryk (2002). We first estimated the unconditional model, which allows for partitioning the variance between the individual-level variables and institution-level variables. We then estimated the full model with all previously identified independent variables.

To reduce multicollinearity and enhance the interpretability of results, we estimated preliminary models for each Foundational Dimension separately to identify the performance indicators related to social and personal competence within each dimension that were statistically significant. These models combined student and faculty performance indicators within a dimension. In each model, we then regressed social and personal competence scores on the performance indicators for a given dimension and a set of control variables. (See Table 2.) For all models, we retained only those performance indicator scales within each dimension that were statistically significant predictors of the outcome variable for subsequent use in a "reduced" model. The scales retained for the final model, as well as all control variables and their metrics, are summarized in Table 2.

Limitations

This study, like all others, is limited in several respects. First, the influences affecting first-year students are many and complexly interrelated. Although this study sought to examine those forces as comprehensively as possible, the conceptual framework adopted to guide it may nonetheless be underspecified. To the extent that important factors may have been overlooked, the study's resulting portrait of the more important influences at work may be incomplete.

TABLE 2
SPECIFICATIONS FOR VARIABLES USED IN FINAL, REDUCED MODEL

Control Variables

Sex: 1 = male, 2 = female

Race: 1 = White, 2 = student of color

Transfer status: 1 = started at this institution, 2 = started at a different institution

Enrollment: 1 = Less than full-time, 2 = full time

Major field: 10 dummy-coded variables: Arts and humanities, biology, business, education, engineering, physical science, professional, social science, other, undecided

Independent Variables of Primary Interest

Organizations Dimension

Faculty/student affairs cooperation: A three-item, faculty-based scale, where 1 = "strongly disagree" and 5 = "strongly agree," measuring faculty perceptions that student affairs staff have the support of faculty; faculty and student affairs staff work closely together in orienting first-year students; and faculty and student affairs staff work closely together in ways that promote first-year students' success (Chronbach's alpha = .86).

Faculty Dimension

Importance of the first year: A four-item, faculty-based scale where 1 = "strongly disagree" and 5 = "strongly agree," measuring faculty perceptions that they are rewarded (e.g., P&T, merit salary) for teaching first-year students; are encouraged to interact with first-year students outside the classroom; are encouraged to learn about first-year students and how to help them succeed; and consider the first year as a time to help students lay the foundation for the rest of their college education (alpha = .74).

All Students Dimension

*Supporting all students: A five-item, student-based scale measuring students' perceptions of the supportiveness of the institutional environment. Items addressed students' perceptions of the institutional emphasis on supporting their academic, personal, and social needs (1 = "very little" to 4 = "very much") and their relationships with faculty and staff members (1 = "unavailable, unhelpful, unsympathetic" to 7 = "available, helpful, sympathetic") (alpha = .71).

Peer environment—supporting all students: The mean scale score for students on the same campus on the supporting all students performance indicator.

Engagement Dimension

Out-of-class engagement: A four-item, student-based scale, where 1 = “never” and 4 = “very often,” measuring how often students engaged in academic activities or with faculty members outside of the classroom (alpha = .67).

*Academic engagement: A five-item, student-based scale measuring how often students actively engage in class activities, such as asking questions or contributing to class discussions (1 = “never” to 4 = “very often”) and the average number of hours each week preparing for class (alpha = .56).

Institutional challenge: A single item reflecting students’ perceptions of the degree to which their institution emphasizes spending significant amounts of time on studying and academic work, where 1 = “very little” and 4 = “very much.”

*Co-curricular engagement: A two-item, student-based scale measuring students’ perceptions of the degree to which the institution emphasizes attending campus events and activities (1 = “very little” and 4 = “very much”) and the average hours spent per week preparing for class (alpha = .25).

Cognitive engagement: A four-item, student-based scale measuring students’ perceptions of the degree to which coursework emphasizes higher-order cognitive skills, where 1 = “very little” and 4 = “very much” (alpha = .82).

Peer environment—cognitive engagement: The mean scale score for students on the same campus on the cognitive engagement performance indicator.

Diversity Dimension

Promoting Diverse Encounters: A 5-item faculty-based scale that asks faculty to indicate how often they: provide opportunities for first-year students in your classes to learn about people who differ from them in background characteristics; provide opportunities for first-year students in your classes to learn about people who differ from them in attitudes or values; give your first-year students assignments that require them to examine ideas/perspectives other than their own; champion a less-accepted point of view for the sake of argument (i.e., play the devil’s advocate); and ask first-year students in class to wrestle with ideas or points of view that differ from their own (alpha = .81).

Diverse Interactions: A four-item, student-based scale measuring the frequency of, and institutional emphasis placed upon, students’ interactions with diverse others and ideas. Examples of items in this scale include “how often have you [the student] (a) had serious conversations with students of a different race or ethnicity than your own and (b) had serious conversations with students who have very different religious beliefs, political opinions, or personal values (1 = “never” to 4 = “very often”). One item measured students’ perceptions of the degree to which the institution emphasizes diverse interactions (1 = “very little” to 4 = “very much”) (alpha = .67).

Table 2, cont.

Improvement Dimension

Assessment for Improvement: A three-item, faculty-based scale that asks faculty to indicate their level of agreement with the statements: “My institution systematically assesses students’ first-year experiences” and “What we learn from those assessments is used to strengthen first-year courses, programs, and services” (1 = “very little” to 4 = “very much”), as well as their perception of the amount of emphasis the institution places on “doing even better” (1 = “very little” to 4 = “very much”) (alpha = .78).

Faculty Development: A three-item, faculty-based scale, where 0 = “none” and 3 = “three or more,” measuring the number of times, during the two years prior to the study that faculty members participated in development activities related to first-year students (alpha = .66).

* For scales using items with different metrics, all items were standardized and a constant of 10 added to eliminate negative z-scores (for ease of interpretation) before a mean scale score was calculated.

Second, the findings should be generalized cautiously. The participating institutions come from only two sectors of the American higher education community—small, private, liberal arts colleges and comprehensive public universities. Each of the 30 institutions participating in the study, moreover, elected to do so. Indeed, 24 of them were selected after a competitive application process. Thus, these institutions, as well as their students and faculty members, may not be representative of four-year colleges and universities, and they may not be typical even of other CIC or AASCU campuses. Indeed, this limitation suggests a potentially fruitful direction for future research: assessing the model used here as it relates to students' experiences at larger, research universities. Nonetheless, they constitute a non-trivial number of institutions and large numbers of students and faculty members. As such, this study is among a small handful that has attempted data collection on such a large and comprehensive scale. In addition, the competitive selection process may well have attenuated the variance in many of the independent and dependent variables in this study, since these institutions had already demonstrated a serious interest in their first-year students' experiences. To the extent that such attenuation exists, the findings reported here may underestimate the impact of the various experiences and conditions identified as salient in the development of students' social and personal competence.

Cautious generalization is also warranted based on the type of student variables available for analysis. As noted previously, the need to collapse the racial/ethnic variable into a dichotomous White/non-White variable for statistical purposes prevents generalizing the findings to smaller, discrete groups within that larger set. Similarly, the only precollege variables were those available on the NSSE, and these did not include some variables that are known to influence student learning (e.g., student socioeconomic status).

Third, the constructs summarized in Figure 1 are complex abstractions, and the measures employed in this study may only partially reflect that complexity. Other measures of those constructs might produce somewhat different findings. The NSSE survey form, however, was developed by a group of leading higher education researchers; and under the guidance of a highly qualified technical advisory group and national advisory board, the instrument has undergone numerous revisions since its initial development in 1998. Similarly, scholars and administrators familiar with the first year of college reviewed the Faculty Survey and suggested constructive revisions. In addition, and with a few exceptions, the internal consistency reliabilities of the scales used in this study are high.

Finally, the study relies on student reports of their first-year gains in social and personal competence as the criterion measure in this study, and such self-reports are open to challenges to their criterion and construct validity. A growing body of evidence, however, suggests that, under appropriate circumstances, self-reported outcomes are reasonable proxies for more

objective, standardized measures (see, for example, Anaya, 1999; Pike, 1995, 1996). Moreover, while self-reports have their limitations when compared with standardized tests, the latter also come with their own limitations, including availability, length, cost, administration requirements, and relevance to the question at hand.

Kuh (2005) reviewed the literature on the validity of student self-reports and identified five conditions that, when met, suggest that self-reports are reasonable proxies for more objective, standardized measures: "(1) the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think the questions merit a serious and thoughtful response; and (5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to answer in socially desirable ways" (p. 158). We believe that the student reports used in this study meet all five of these conditions and, thus, are reasonable proxies for more objective measures.

FINDINGS

Fully Unconditional Model

HLM permits a comparison of between-institution and within-institutions effects, allowing an estimation of the influence of the institutional-level variables and the influence of the individual-level variables. Beginning with a fully unconditional model (e.g., one with no Level 1 or Level 2 predictors) also tests the assumption that at least some of the variance in the outcome measure is attributable to institutional differences (Raudenbush & Bryk, 2002). Table 3 presents the results of the fully unconditional model for social and personal competence.

The results indicate a grand mean for the outcome variable of 2.67 (SE = .035), on a scale of 1 to 4. Student-level variables accounted for the vast majority of the variance in social and personal competence. The estimated value of the variance at the student level (sigma-squared) was .487, accounting for 93.7% of the total variance. The estimated value of the institution level variance (tau) was .033, or 6.3% of the total. Although relatively small, this contribution of between-institution variance was greater than 5% and statistically significant—two indicators that HLM analysis may proceed (Porter, 2005; Raudenbush & Bryk, 2002). This level of variance contributed by institution-level variables is, moreover, consistent with those reported in similar studies (Hu & Kuh, 2003; Umbach & Porter, 2002)

TABLE 3
HLM UNCONDITIONAL MODEL

<i>Fixed Effects</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>t-ratio</i>	<i>d.f.</i>	<i>p-value</i>
Intercept for social and personal competence, B0	2.668	.0347	76.8	29	< .000
<i>Random Effects</i>	<i>Standard Deviation</i>	<i>Variance Component</i>	<i>d.f.</i>	<i>Chi-square</i>	<i>p-value</i>
Intercept for social and personal competence, U0	.18067	.03264	29	392.81	< .000
Sigma-squared	.48668				
Tau	.03264				
Interclass correlation	.063				

Final Model

The final analysis consisted of five previously identified statistically significant student-level control variables (gender, race, enrollment status, transfer status, and major) and seven student-level performance indicators (Supporting All Students, Out-of-Class Engagement, Academic Engagement, Institutional Challenge, Co-curricular Engagement, Cognitive Engagement, and Diverse Interactions). The final model also contained four institution-level performance indicators representing the faculty culture and perceptions (Faculty/Student Affairs Staff Cooperation, Importance of the First Year, Promoting Diverse Encounters, and Faculty Development) and two peer environment scales (Supporting All Students—Peer Environment and Cognitive Engagement—Peer Environment). Notably, no conventional institutional indicators (e.g., institutional sector, urbanicity) were significant in any of the preliminary models and hence were not included in the final analysis.

The results of the final model are shown in Table 4. The intercept coefficient for the final model remained 2.67 (SE = .017), which was statistically significant at the $p < .001$ level. Comparing the residual variance of the final model with the allocated variance of the fully unconditional model allows estimation of the explanatory power of our final model. Recall that the value of the variance attributable to institutional differences in the fully unconditional model was .033. The residual variance at the institutional level in the final model was .007. The final model thus accounted for approximately 80% of the original institution-level variance ($[(.033-.007)/.033 = .801]$). Similarly, the individual level variance reduced from .487 to a residual value of .275, a reduction of 43.5%.

Institutional effects on social and personal competence. Only one institution-level variable, the Supporting All Students—Peer Environment scale, was a statistically significant predictor of Social and Personal Competence (Coefficient = .366, SE = .164, $p < .05$). Since the overall intercept ($\beta = 2.67$) is the average institutional mean on the outcome measure (Raudenbush & Bryk, 2002), this coefficient indicates that for each one-point increase on the Supporting All Students—Peer Environment scale an institution can expect a .336 increase in mean development of Social and Personal Competence. Also of note, however, is the Faculty Development scale, which includes items related to amount of time faculty members spend in professional development activities specific to first-year students. It approached the standard criterion for statistical significance ($p < .11$). Although not meeting the conventional criteria for statistical significance, this finding, as discussed below, is both substantively and theoretically interesting.

Individual variables of interest. Seven individual level performance indicators reached statistical significance in the final model. The Supporting

TABLE 4
FINAL MODEL RESULTS

<i>Fixed Effects</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>t-ratio</i>	<i>d.f.</i>	<i>p-value</i>
Intercept for social and personal competence, B0					
Intercept, G00	2.673	.017	158.32	21	< .000
Faculty/student affairs collaboration, G01	.164	.117	1.40	21	n.s.
Importance of the first year, G02	-.190	.199	-.96	21	n.s.
Promoting diverse interactions, G03	.029	.108	.27	21	n.s.
Assessment for improvement, G04	.080	.109	.73	21	n.s.
Faculty development, G05	.180	.107	1.68	21	n.s.
Supporting all students—Peer environment, G06	.366	.164	2.23	21	.037
Cognitive engagement—Peer environment, G07	.343	.34	1.00	21	n.s.
Diverse interactions—Peer environment, G08	.033	.168	.19	21	n.s.
Transfer slope, B1	-.028	.025	-1.13	6109	n.s.
Enrollment slope, B2	-.011	.028	.38	6109	n.s.
Gender slope, B3	.037	.016	2.35	6109	.019
Race slope, B4	.027	.019	1.40	6109	n.s.
Arts and humanities slope, B5	.089	.100	.89	6109	n.s.
Biology major slope, B6	.099	.103	.97	6109	n.s.
Business major slope, B7	.197	.100	1.98	6109	.047
Education major slope, B8	.197	.100	1.48	6109	n.s.
Engineering major slope, B9	.120	.114	1.72	6109	n.s.
Physical science major slope, B10	.155	.106	1.14	6109	n.s.
Professional major slope, B11	.155	.100	1.55	6109	n.s.
Social science major slope, B12	.172	.100	1.54	6109	n.s.
Other major slope, B13	.109	.100	1.72	6109	n.s.
Out-of-class engagement slope, B14	.084	.015	5.67	6109	< .000

Table 4, cont.

<i>Fixed Effects</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>t-ratio</i>	<i>d.f.</i>	<i>p-value</i>
Academic engagement slope, B15	.065	.015	4.38	6109	< .000
Institutional challenge slope, B16	.056	.010	5.62	6109	< .000
Co-curricular engagement slope, B17	.041	.010	3.95	6109	< .000
Cognitive engagement slope, B18	.169	.012	13.73	6109	< .000
Diverse interactions slope, B19	.169	.012	13.62	6109	< .000
Supporting all students slope, B20	.379	.012	32.92	6109	< .000
<i>Random Effects</i>	<i>Standard Deviations</i>	<i>Variance Component</i>	<i>d.f.</i>	<i>Chi-square</i>	<i>p-value</i>
Intercept for social and personal competence, U0	.0806	.0065	21	123.899	0.000
Level One variance, R	.5245	.2751			
Sigma-square*	.2751				
Tau*	.0065				

* Value of the variance left unexplained at each level.

All Students performance indicator ($\beta = .379$, $SE = .012$, $p < .001$) was the strongest Level 1 predictor of Social and Personal Competence, followed by Diverse Interactions ($\beta = .169$, $SE = .012$, $p < .001$) and Cognitive Engagement ($\beta = .169$, $SE = .012$, $p < .001$). The remaining four individual-level performance indicators, while statistically significant, had beta weights that indicated they played a somewhat weaker role than students' perceptions of their institution's support or their encounters with diversity. Out-of-Class Engagement ($\beta = .084$, $SE = .015$), Academic Engagement ($\beta = .065$, $SE = .015$), Institutional Challenge ($\beta = .056$, $SE = .010$), and Co-curricular Engagement ($\beta = .041$, $SE = .010$) were all statistically significantly related to the Social and Personal Competence scale.

SUMMARY AND CONCLUSIONS

The first year of college is vitally important for several reasons. Among other things, it is the foundational year, the period in which students develop (or fail to develop) the attitudes, behaviors, skills, knowledge, and habits of mind on which their subsequent academic and occupational preparation and success will depend. The first year is also a period of intense learning. Indeed, perhaps two-thirds or more of the gains students make in their general learning and cognitive development occur during their first two years (Pascarella & Terenzini, 2005). The dynamics underlying the influence of college experiences on students' development of social or personal competence, however, are not as clear as those shaping students' academic and intellectual development. Moreover, although the research clearly establishes college's influence on a wide array of psychosocial and attitudinal changes over the course of students' college careers, considerably less is known about changes occurring during students' first college year.

In addition, and although research on students' first-year experience abounds (Upcraft, Gardner, Barefoot, & Associates, 2005), only a few studies (e.g., Astin, 1993; Pascarella, Whitt, et al., 1996) have attempted to assess other factors, such as the peer environment or faculty attitudes and behaviors, that may also shape both students' experiences and, ultimately, what and how they learn and change.

This study extends the existing research through a comprehensive examination of the influences shaping the development of first-year students' social and personal competence (e.g., working with others, understanding self and diverse others, developing personal values and ethics, solving complex real-world problems, and learning on one's own). In particular, the study sought to isolate the effects not only of students' experiences, but also those of the faculty culture and of an array of institutional features.

As one might expect, the study results indicate that students' experiences had the greatest impact on their end-of-year reports of gains in social and

personal competence. Indeed, all seven measures of student perceptions and engagement in a variety of areas showed statistically significant contributions to reported gains. Students' perceptions of the supportiveness of their institution's environment was most strongly related to increases in social and personal competence, followed by students' perceptions of the emphasis their courses placed on higher-order thinking skills and the emphasis their institution placed on student encounters with diverse people and ideas, as well as how often students had such encounters.

Perhaps more interesting and important is the finding that increased social and personal competence also appears to be shaped positively, if to a smaller degree, by a campus's peer environment, particularly one characterized by peers' collective perceptions that their institution's faculty and staff support students' academic, personal, and social needs. The findings further suggest that the level at which an institution's faculty members participate in development activities relating to first-year students may also be a factor. Although in this study the influence of such faculty activities failed to meet conventional standards of statistical significance ($p < .11$), the finding is nonetheless substantively noteworthy, given the attenuated statistical power of aggregate, institution-level variables (faculty means) such as this one.

Studies of college effects typically focus on the influence of one or more student experiences during college. Occasionally, an aggregate (usually the arithmetic mean) of these experiences across students at the same institutions is introduced as a measure of the peer environment. Both of these influences, however, exist within a still broader setting—the organizational context, a set of conditions frequently overlooked entirely or more often operationalized in terms of such institutional characteristics as type of control, size, mission, or selectivity. For more than 35 years, however, studies of between-college effects (those attributable to differences in the characteristics of the institutions students attended) have shown that the conventional descriptors used to differentiate between and among institutions (e.g., type of control, size, mission, selectivity) are poor predictors of psychosocial, cognitive, or attitudinal changes in students (Astin, 1993; Pascarella & Terenzini, 1991, 2005). Pascarella and Terenzini (2005) concluded that other measures more proximate to students' experiences have greater explanatory potential. In designing this study, and following those suggestions, we hypothesized that what institutions *do*—their internal and operational practices, policies, and values, as well as the faculty culture that supports those operations, will be more closely related to student change than what those institutions *are* (e.g., their size, control, selectivity).

The study's findings are consistent with those expectations. First, net of other factors, measures of participating institutions' sector (liberal arts college or comprehensive university) and urbanicity were both unrelated to changes in students' social and personal competence. These two conventional

measures, moreover, are virtually synonymous with such other traditional institutional descriptors as size, institutional mission, and Carnegie Classification, perhaps even with the proportion of students living on campus.

Second, even though their effects are neither numerous nor large, net of students' precollege traits and subsequent college experiences, aspects of internal institutional functioning do appear to play a role. The peer environment made a statistically significant and substantial contribution, and participation in faculty development programs emphasizing the first year of college was a marginal ($p < .11$) contributor to increases in students' social and personal competence.

These findings are consistent, moreover, with the evidence from a study of the influences on increases in academic competence in this same sample of students (Reason, Terenzini, & Domingo, 2005). Our study's findings are also consistent with those of a study of the effects of changes in the accreditation criteria on student learning in more than 200 engineering programs on 40 campuses. Lattuca, Terenzini, and Volkwein (2005) found that seven of 11 variables reflecting changes over the previous 10 years in various curricular, pedagogical, and organizational aspects of programs in seven engineering disciplines were significantly and sometimes substantially related to changes over the same period in the kinds of experiences students were having in 10 different in- and out-of-class areas. Those changes in experiences were, in turn, clearly and independently related to differences between 1994 and 2004 engineering graduates in their level of the preparedness to enter the engineering profession.

Our study's findings have implications for both practice and theory. The evidence indicates, at its simplest, that the kinds of experiences students have in their first year of college shape the amount and nature of student learning and change—in this case, students' social and personal competence. Practitioners can use the findings of this study to identify (and develop programs that promote) the kinds of student experiences that may be the most educationally effective: experiences that challenge students cognitively and support them during the first year.

Academic and student affairs administrators and staff can also use these findings as guides in reviewing current programs and developing new ones. Questions can be asked about the extent to which students are engaged in the kinds of activities that promote social and personal competence. But questions can also be asked about whether current efforts are consistent with the promotion and support of students' cognitive engagement, as well as with faculty development activities that focus on the first year of college. The evidence also suggests that a broader administrative and programmatic vision may be needed. Development of social and personal competence also appears to be influenced, at least to some extent, by conditions in the peer environment *and* in an institution's internal functioning and its faculty

culture as they relate to the first college year. Colleges and universities may not be taking advantage of the full complement of opportunities available to them to enhance their educational programs and student learning.

The findings also suggest a rethinking of current theories to explain student learning and change. Certainly no shortage of such theories exists, but the evidence from this study indicates that current theory may underspecify the forces at work, focusing too narrowly on only one influence (or a subset of influences) at work. Pascarella and Terenzini (2005) have suggested the need for multidisciplinary theoretical conceptions of college's impacts on students to more fully account for the forces at work in shaping student learning and change. The findings of this study (and others cited above) suggest a need for a more comprehensive, integrated view of the first year of college than is currently available, one that takes into account the multiple student, faculty, and internal institutional influences shaping first-year student learning.

REFERENCES

- Anaya, G. (1999). College impact on student learning: Comparing the use of self-reported gains, standardized test scores, and college grades. *Research in Higher Education, 40*, 449–526.
- Antonio, A. (2000, April). *Developing leadership skills for diversity: The role of interracial interaction*. Paper presented at the meeting of the American Educational Research Association, New Orleans.
- Antonio, A. (2001). Diversity and the influence of friendship groups in college. *Review of Higher Education, 25*, 63–89.
- Armor, D. J. (1974). Theta reliability and factor scaling. In H. Costner (Ed.), *Sociological methodology: 1973–1974* (pp. 17–50). San Francisco: Jossey-Bass.
- Astin, A. (1993). *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.
- Belcheir, M. J. (2001, May). *What predicts perceived gains in learning and in satisfaction?* ERIC Report 480–921.
- Berger, J. (2000). Organizational behavior at colleges and student outcomes: A new perspective on college impact. *Review of Higher Education, 23*, 177–198.
- Berger, J. (2001–2002). Understanding the organizational nature of student persistence: Empirically-based recommendations for practice. *Journal of College Student Retention, 3*, 3–21.
- Berger, J. (2002). The influence of the organizational structures of colleges and universities on college student learning. *Peabody Journal of Education, 77*, 40–59.
- Berger, J., & Milem, J. (2000). Organizational behavior in higher education and student outcomes. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 15, pp. 268–338). New York: Agathon.
- Braxton, J., Sullivan, A., & Johnson, R. (1997). Appraising Tinto's theory of college student departure. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 12, pp. 107–158). New York: Agathon.

- Cabrera, A. F., Burkum, K. R., & La Nasa, S. M. (2005). Pathways to a four-year degree: Determinants of transfer and degree completion. In A. Seidman (Ed.), *College student retention: A formula for student success* (pp. 155–214). Praeger Series on Higher Education. Westport, CT: Greenwood, ACE.
- Cabrera, A., & La Nasa, S. (2001). On the path to college: Three critical tasks facing America's disadvantaged. *Research in Higher Education*, 42, 119–149.
- Carini, R. M., Kuh, G. D., & Klein, S. P. (2005). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, 47(1), 1–32.
- Chang, M. (1999). Does racial diversity matter?: The educational impact of a racially diverse undergraduate population. *Journal of College Student Development*, 40, 377–395.
- Dey, E. (1991). *Community service and critical thinking: An exploratory analysis of collegiate influences*. Paper presented at the meeting of the conference on Setting the Agenda for an Effective Research Strategy for Combining Service and Learning in the 1990s, Wingspread Conference Center, Racine, WI.
- Ewell, P. T. (2002). *An analysis of relationships between NSSE and selected student-learning outcomes measures for seniors attending public institutions in South Dakota*. Boulder, CO: National Center for Higher Education Management Studies.
- Ewell, P. T. (2005). *Relating results of the ACT Work Keys and the Community College Survey of Student Engagement (CCSSE)*. Boulder, CO: National Center on Higher Education Management Systems.
- Filkins, J. W., & Doyle, S. K. (2002, June). *First generation and low income students: Using the NSSE data to study effective educational practice and students self-reported gains*. Paper presented at the Annual Forum of the Association for Institutional Research. Toronto, Ontario, Canada.
- Flowers, L. (2000). *Cognitive effects of college: Differences between African-American and Caucasian students*. Unpublished doctoral dissertation, University of Iowa, Iowa City.
- Flowers, L., Osterlind, S., Pascarella, E., & Pierson, C. (1999). *How much do students learn in college? Cross-sectional estimates using the College Basic Academic Subjects Examination*. Unpublished manuscript, University of Iowa, Iowa City.
- Hossler, D., Schmit, J., & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. Baltimore, MD: Johns Hopkins University Press.
- Hu, S., & Kuh, G. D. (2003). Maximizing what students get out of college: Testing a learning productivity model. *Journal of College Student Development*, 44, 185–203.
- Hurtado, S. (1997). *Linking diversity with educational purpose: College outcomes associated with diversity in the faculty and student body*. Unpublished manuscript, Harvard Civil Rights Project, Harvard University, Cambridge, MA.
- Johnson, D., & Johnson, R. (1995). *Creative controversy: Intellectual challenge in the classroom*. Edina, MN: Interaction Book Company.
- Johnson, D., Johnson, R., & Smith, K. (1996). *Academic controversy: Enriching college instruction through intellectual conflict*. Washington, DC: George Washington University, Graduate School of Education and Human Development.
- Kuh, G. D. (2001, May/June). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change*, 33, 10–17, 66.

- Kuh, G. D. (2005). Imagine asking the client: Using student and alumni surveys for accountability in higher education. In J. C. Burke (Ed.), *Achieving accountability in higher education: Balancing public, academic, and market demands* (pp. 148–172). San Francisco: Jossey-Bass.
- Kuh, G. D., Hayek, J. C., Carini, R. M., Ouimet, J. A., Gonyea, R. M., & Kennedy, J. (2001). *NSSE technical and norms report*. Bloomington: Indiana University Center for Postsecondary Research and Planning.
- Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J., & Associates (2005). *Student success in college: Creating conditions that matter*. San Francisco: Jossey-Bass.
- Lattuca, L. R., Terenzini, P. T., & Volkwein, J. F. (2005, October). *Findings from engineering change: A study of the impact of EC2000*. Presentation to the annual meeting of the Accrediting Board for Engineering and Technology, San Diego, CA.
- Nelson Laird, T. F., Shoup, R., & Kuh, G. D. (2005, June). *Deep learning and college outcomes: Do fields of study differ?* Paper presented at the annual forum of the Association for Institutional Research. San Diego, CA.
- Osterlind, S. (1996). *Collegians' scholastic achievement in general education: A national look*. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Osterlind, S. (1997). *Collegians' achievement in general education: A national look*. Washington, DC: George Washington University.
- Pascarella, E., Pierson, C., Wolniak, G., & Terenzini, P. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *Journal of Higher Education*, 75, 249–284.
- Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco: Jossey-Bass.
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students. Vol. 2: A third decade of research*. San Francisco: Jossey-Bass.
- Pascarella, E., Whitt, E., Nora, A., Edison, M., Hagedorn, L., & Terenzini, P. (1996). What have we learned from the first year of the national study of student learning? *Journal of College Student Development*, 37, 182–192.
- Paulsen, M., & St. John, E. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *Journal for Higher Education*, 73, 189–236.
- Pike, G. (1995). The relationships between self-reports of college experiences and achievement test scores. *Research in Higher Education*, 36(1), 1–22.
- Pike, G. (1996). Limitations of using students' self-reports of academic development as proxies for traditional achievement measures. *Research in Higher Education*, 37, 89–114.
- Porter, S. R. (2005). What can multilevel models add to institutional research? In M. A. Coughlin (Ed.), *Applications of intermediate/advanced statistics in institutional research* (pp. 110–131). Resources in Institutional Research, No. 16. Tallahassee, FL: Association for Institutional Research.
- Qin, Z., Johnson, D., & Johnson, R. (1995). Cooperative versus competitive efforts and problem solving. *Review of Educational Research*, 65, 129–143.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear modes: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

- Reason, R. D., Terenzini, P. T., & Domingo, R. J. (2005). First things first: Developing academic competence in the first year of college. *Research in Higher Education, 47*, 149–176.
- Smart, J., Feldman, K., & Ethington, C. (2000). *Academic disciplines: Holland's theory and the study of college students and faculty*. Nashville, TN: Vanderbilt University Press.
- Stevens, J. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.
- Tate, R. (2004). Interpreting hierarchical linear and hierarchical generalized linear models with slopes as outcomes. *The Journal of Experimental Education, 73*(1), 71–95.
- Terenzini, P. T., Cabrera, A., & Bernal, E. (2001). *Swimming against the tide: The poor in American higher education*. College Board Research Report No. 2001–3. New York: The College Board.
- Terenzini, P. T., & Reason, R. D. (2005, November). *Parsing the first-year of college: A conceptual framework for studying college impacts*. Paper presented at the annual conference of the Association for the Study of Higher Education. Philadelphia, PA.
- Terenzini, P. T., Springer, L., Pascarella, E. T., & Nora, A. (1995). Influences affecting the development of students' critical thinking skills. *Research in Higher Education, 36*, 23–29.
- Terenzini, P. T., Springer, L., Yaeger, P., Pascarella, E., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education, 37*, 1–22.
- Umbach, P. D., & Porter, S. R. (2002). How do academic departments impact student satisfaction? Understanding the contextual effects of departments. *Research in Higher Education, 43*, 209–234.
- Upcraft, M. L., Gardner, J. N., Barefoot, B. O., & Associates (Eds.). (2005). *Challenging and supporting the first-year student: A handbook for improving the first year of college*. San Francisco: Jossey-Bass.
- Volkwein, J. (1991, November). *Improved measures of academic and social integration and their association with measures of student growth*. Paper presented at the meeting of the Association for the Study of Higher Education, Boston.
- Whitt, E., Pascarella, E., Pierson, C., Elkins, B., & Marth, B. (in press). *Sex and gender in college: Evidence of differences in experiences and outcomes*. Nashville, TN: Vanderbilt University Press.
- Zea, M., Reisen, C., Beil, C., & Caplan, R. (1997). Predicting intention to remain in college among ethnic minority and non-minority students. *Journal of Social Psychology, 137*, 149–160.
- Zhao, C., & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education, 45*, 115–138.