RUNNING HEAD: Good Practices

Liberal Arts Colleges and Good Practices in Undergraduate Education: Additional Evidence*

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ABSTRACT

Liberal arts colleges have prided themselves on providing students with a quality undergraduate education among a scholarly community who are interested in their holistic development. Past research has found students who attended liberal arts colleges more frequently experienced Chickering and Gamson's (1987, 1991) good practices in undergraduate education than their peers. This study examined if this experience differed based on students' background or precollege characteristics. Overall, we found students at liberal arts colleges who enter college with lower levels of parental education, precollege academic preparation, academic motivation, and high school involvement experienced these good practices at levels greater than their peers.

The small, private liberal arts college has long been considered the ideal in providing a rigorous, high quality undergraduate education (e.g., Astin, 1999; Chickering, 1969; Chickering & Reisser, 1993; Clark, 1970; Koblick & Graubard, 2000; Pascarella & Terenzini, 1991; Umbach & Kuh, 2006). Recently, a small body of research has systematically assessed the extent to which liberal arts colleges actually foster empirically vetted good practices during the undergraduate experience (e.g., Pascarella, Wolniak, Cruce, & Blaich, 2004; Pascarella, Wolniak, Seifert, Cruce, & Blaich, 2005). The purpose of our study was to determine if past findings in which students at liberal arts colleges, compared to their peers at other types of institutions, reported greater exposure to good practices in undergraduate education would replicate in a more updated sample, while employing more stringent analytic procedures. To extend current findings on this topic, we also investigated to what extent these effects were the same for all students or differed by student background or precollege characteristics.

CONCEPTUAL FRAMEWORK

The conceptual framework for this study is based on theories of college impact (Astin, 1993; Pascarella, 1985; Weidman, 1989, 2006). From this perspective, we draw heavily from Astin's (1993) Inputs-Environments-Outputs model. In order to best assess the influence of an institutional environment (e.g., attending a liberal arts college compared to another type of institution) on a particular outcome (e.g., experiences of good practices in undergraduate education), it is critical to first account for students' input characteristics. Commonly, students' sociodemographic characteristics (e.g., gender, race/ethnicity, parental education and/or income) and precollege characteristics (e.g., precollege academic preparation, academic motivation, and high school involvement) are salient inputs included in studies of college impact (Pascarella & Terenzini, 1991, 2005). See Figure 1 for a graphic representation. To isolate the influence of a

specific environment (institutional type) on the outcome (good practice dimensions), we further take into account other college environment/experiences that might otherwise confound the relationship of interest. These other variables include whether a student lives on-campus, the total amount the student works on and off campus, and the number of courses the student has taken in the traditional arts and science disciplines. See Figure 2. College impact models, that isolate the influence of environmental factors on outputs by accounting for students' input characteristics (Astin, 1993; Pascarella, 1985; Weidman, 1989, 2006), provide the conceptual framework for the analysis in this study.

Good Practices in Undergraduate Education

Chickering and Gamson (1987, 1991) synthesized much of the evidence on the impact of the college environment on student outcomes and translated these characteristics into seven principles for good practice in undergraduate education. The seven principles are: a) student faculty contact, b) cooperation among students, c) active learning, d) prompt feedback to students, e) time on task, f) high academic expectations, and g) respect for diverse students and diverse ways of knowing.

Past research has empirically vetted the seven dimensions of good practice. In the presence of controls for confounding influences, individual good practice dimensions have been positively linked to desired aspects of cognitive and non-cognitive growth during college and to career and personal benefits after college (Astin, 1993; Chickering & Reisser, 1993; Kuh, Schuh, Whitt, & Associates, 1991; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005; Pascarella & Terenzini, 1991, 2005). Other evidence on college impact not synthesized by Chickering and Gamson (1987, 1991) suggests the predictive validity of two additional dimensions of good practice in undergraduate education. These are: a) the quality of teaching received, specifically

clear and well-organized instruction (Feldman, 1997; Hines, Cruickshank, & Kennedy, 1985; Pascarella, Edison, Nora, Hagedorn, & Braxton, 1996; Pascarella, Seifert, & Whitt, 2008; Wood & Murray, 1999), and b) influential interactions with other students (Astin, 1993; Cruce, Wolniak, Seifert, & Pascarella, 2006; Whitt, Edison, Pascarella, Nora, & Terenzini, 1999).

The principles of good practice (e.g., active learning, time on task, and high academic expectations) are not isolated but interact with one another to form a campus environment that both challenges and supports students as they develop. Research has empirically demonstrated the substantive overlap of the good practice dimensions in creating a campus environment. Cruce and his colleagues (2006) found 19 individual scales measuring nearly all of the aforementioned good practice dimensions clustered into three underlying good practice scales: a) effective teaching and interaction with faculty; b) interactions with peers; and c) academic challenge/high expectations. Each of these three general good practice scales was positively associated with one or more nine cognitive and non-cognitive outcomes, controlling for potential confounding influences including a parallel precollege measure of each outcome. For example, students' exposure to effective teaching and interaction with faculty positively influenced their reading comprehension, critical thinking, openness to diversity and challenge, and internal locus of attribution for academic success in their first year of college. Related research has reported similar results using a global measure of good practices (Seifert, Goodman, Lindsay, Jorgensen, Wolniak, Pascarella, & Blaich, 2008).

Although it has been generally assumed that students attending small private liberal arts colleges are more likely to experience good practices in undergraduate education than their counterparts at other types of postsecondary institutions (e.g., Koblick & Graubard, 2000; Pascarella & Terenzini, 1991; "What Matters in College After College," 2002), only recently has

this assumption been examined empirically (Jayakumar, 2007; Pascarella et al., 2004, 2005; Umbach & Kuh, 2006). Using longitudinal data from the 1992-95 National Study of Student Learning (NSSL), research has estimated the net effects of liberal arts colleges (vs. research universities and regional institutions) on 19 (Pascarella et al., 2004) and 21 (Pascarella et al., 2005) separate measures of good practices in undergraduate education. Controlling for confounding influences, students attending liberal arts colleges reported greater exposure to about 80% of the good practice indicators than their counterparts attending other institutional types. Umbach and Kuh examined the extent to which liberal arts colleges fostered students' experiences specifically with diversity. Analyzing cross-sectional data from the 2002 administration of the National Survey of Student Engagement (NSSE), they found students at liberal arts colleges had greater exposure to diversity experiences than students attending all other types of four-year institutions. The evidence, however, is not consistent on the relative advantage that students at liberal arts colleges have in terms of exposure to diversity experiences, particularly as those experiences connect to students' post-college lives. Jayakumar found attending a liberal arts college had no influence on the development of students' post-college pluralistic orientation and had a negative long term effect for White students from segregated precollege neighborhoods.

Although the small body of recent research supports the contention that liberal arts colleges foster vetted good practices in undergraduate education, the constituent studies have a number of distinct limitations. First, the 1992-95 NSSL data analyzed by Pascarella and colleagues (2004, 2005) is dated; we do not know that students experience college today in ways that are similar to those of 15 years ago. Second, the research conducted by Pascarella et al. is limited in that the sample consisted of only five liberal arts colleges. The small number of liberal

arts colleges in the overall sample may have led to results that are attributable to an outlier institution rather than representative of all liberal arts colleges. Third, the analyses failed to account for the nested nature of the data (i.e., students are clustered within institutions). To the extent that intra-class correlations (between-institution variances) on the good practice dimensions are expected to be substantial, there is a distinct danger that ordinary least-square parameter estimates will have standard errors that are biased downwards (Bryk & Raudenbush, 1992). In short, an unknown number of statistically significant advantages attributed to attending a liberal arts college, as reported by Pascarella et al., might actually be nonsignificant if the researchers had taken into account the clustered nature of students within schools.

The study by Umbach and Kuh (2006) accounted for the nested nature of the data and had a much larger sample of institutions than the NSSL studies by Pascarella et al. (2004, 2005). However, the cross-sectional nature of the NSSE data meant that statistical adjustments could not be made for potential selection bias across institutional type on such salient student traits as precollege academic motivation or level of high school engagement. Because students who were motivated and involved in high school are more likely to seek these experiences in college, longitudinal studies can control for students "beginning" characteristics and therefore more clearly illustrate any institutional effect associated with college experiences. The higher level of diversity experiences noted at liberal arts colleges in the Umbach and Kuh study could, in substantial part, be attributable to the characteristics of the students enrolled rather than any distinctive culture of liberal arts colleges.

Among the good practice research, Jayakumar's (2007) study is the most methodologically sound, in that it is both longitudinal and accounted for the nested (or clustered) nature of students within schools. It is limited in that it examined outcomes associated solely

with the good practice of developing respect for diverse students and diverse ways of knowing. Although this is a critical aspect of undergraduate education in today's intercultural world (American Association of Colleges & Universities [AAC&U], 2004; Carnevale & Desrochers 2002; Kalantzis, Cope, & Harvey 2003; King & Baxter Magolda, 2005; Rychen & Salganik 2001, 2003; Thomas & Ely 1996), it fails to represent the breadth of good practices identified by Chickering and Gamson (1987, 1991).

Nearly half of all students in postsecondary education in the U.S. attend two-year colleges (Laanen, 2001; National Center for Education Statistics [NCES], 2008), with a disproportionate number of historically underserved students attending two-year colleges compared to four-year institutions (NCES). Despite the increasing role community colleges play in U.S. postsecondary education, none of the research that has looked at the effects of institutional type on experiences of good practices in undergraduate education has included community colleges in their institutional sample.

Addressing sample, methodological, and outcome limitations of existing research, this study builds upon and extends the previous literature by analyzing whether the positive effects of liberal arts colleges on good practices in undergraduate education identified previously would replicate with a different sample assessed nearly 15 years after the original sample analyzed by Pascarella and colleagues (2004, 2005). Moreover, the study sought to determine whether the effects of liberal arts colleges on good practices were essentially the same for all students, or whether they differed in magnitude for different kinds of students.

METHOD

Institutional Sample

The sample in the study consisted of full-time first-year students at 19 four-year and two-year colleges and universities located in 11 different states from the Northeast, Southeast, Midwest, and West regions of the United States. Institutions were selected from more than 60 colleges and universities responding to a national invitation to participate in the Wabash National Study of Liberal Arts Education (WNSLAE). Funded by the Center of Inquiry in the Liberal Arts at Wabash College, this is a multi-institutional, longitudinal investigation of the effects of liberal arts colleges and college experiences on the cognitive and personal outcomes theoretically associated with a liberal arts education. The institutions differed on a variety of characteristics including type, control, size, location, and patterns of student residence. Because of the study's focus, liberal arts colleges were purposefully over-represented.

Our selection technique produced an institutional sample with a wide range of academic selectivity, from some of the most selective institutions in the country to some that were open admissions. There was also substantial variability in undergraduate enrollment, from institutions with entering classes between 3,000 and 6,000 students, to institutions with entering classes between 250 and 500 students. According to the 2007 Carnegie Classification of Institutions, 3 of the participating institutions were research universities, 3 were regional universities that did not grant the doctorate, 2 were two-year community colleges, and 11 were liberal arts colleges. The institutional sample of liberal arts colleges, research universities, and community colleges in the WNSLAE did not substantively overlap with the NSSL institutional sample analyzed by Pascarella and colleagues (2004, 2005). Only one regional institution was in both the WNSLAE and NSSL studies.

Student Sample

The individuals in the sample were first-year, full-time undergraduate students attending one of the 19 institutions in the study. We selected the initial student sample in one of two ways. First, for larger institutions, we sampled students randomly from the incoming first-year class at each institution. The only exception to this was at the largest participating institution in the study, where we sampled randomly from the incoming class in the College of Arts and Sciences. Second, we sampled the entire incoming first-year class at the liberal arts colleges. Students in the sample received letters from their institution inviting them to participate in a national longitudinal study examining how a college education affects students. We informed students that they would receive a $50 monetary stipend for their participation in each wave of data collection and assured them in writing that any information they provided would be kept in the strictest confidence and never become part of their institutional records.

Data Collection

We conducted the initial data collection (lasting between 90-100 minutes) in the early fall of 2006 with 4,501 students. The data collected included a WNSLAE precollege survey asking student demographic, background, and other precollege questions. Students also completed a series of survey instruments measuring dimensions of cognitive and personal development theoretically associated with a liberal arts education.

We collected two types of data in the two-hour follow-up in spring 2007. We gathered student experience data using the NSSE (Kuh, 2001) and the WNSLAE Student Experiences Survey (WSES). These instruments were designed to elicit the extent to which students are exposed to, or experience, empirically vetted good practices in undergraduate education. The WSES substantially overlaps with the questionnaire items used in the NSSL. We also gathered

posttest data on the instruments administered during the first data collection. We provide operational definitions for all variables in the study in Table 1.

Of the original sample of 4,501 students who participated in the fall 2006 testing, 3,081 participated in the spring 2007 follow-up data collection, for a response rate of 68.5%. We found some modest difference in the attrition by institutional type. To provide at least some adjustment for this and potential bias by gender, race/ethnicity, tested precollege academic preparation, and institution in the sample of students, we developed a weighting algorithm from institutionally-provided data. For example, if there were 25 African American women who scored in the third ACT quartile in the sample from a particular institution and there were 100 women in that institution's population, the women in our sample would receive a weight of 4. We recognize that applying weights in this manner, while having the effect of making the overall sample more similar to the population from which it was drawn, cannot adjust for nonresponse bias. Because only three percent of students in our sample had missing data on any variables in the regression model, we chose to use listwise deletion as opposed to other imputation methods. Useable data were available for 2,986 students. The weighted sample consisted of 758 students at liberal arts colleges, 764 at regional institutions, 1,041 at research universities, and 423 at community colleges.

Variables

Dependent variables: Good practices. In operationally defining "good practices," the literature and predictive validity evidence previously reviewed in the section on "Good Practices in Undergraduate Education" served as a conceptual guide. To measure good practices in undergraduate education, we selected items and created scales from the WSES and NSSE that substantively reflected the empirically vetted scales used in previous studies of good practices in

undergraduate education (Cruce et al., 2006; Pascarella et al., 2004, 2005, 2006). The resulting scales and items were designed to tap a range of good practices that includes such dimensions as: student-faculty interaction, active learning/time on task, quality of teaching, prompt feedback from faculty, cooperative learning, high academic expectations, diversity experiences, influential interactions with other students, and integrative experiences.

Consistent with the data-reduction procedures of Cruce and colleagues (2006), we submitted the numerous good practice scales and items to a principal components factor analysis. Because previous research has used items either from the NSSL (Cruce et al., 2006; Pascarella et al., 2004, 2005) or the NSSE (Pascarella et al., 2006) but not both, it was not surprising that our underlying structure of good practice dimensions was somewhat more complex than the three factors uncovered by Cruce and his colleagues. Six factors appeared to underlie the individual measures of good practices in the WNSLAE data: "Good teaching and high quality interactions with faculty," "Academic challenge and high expectations," "Influential interactions with peers," "Diversity experiences," "Frequency of interactions with faculty/professional staff," and "Cooperative learning."

The first three scales (good teaching and high quality interactions with faculty, academic challenge and high expectations, and influential interactions with peers) were essentially the same as those reported by Cruce and colleagues. However, the diversity experiences, frequency of interactions with faculty/professional staff, and cooperative learning scales became additional good practice dimensions in our analyses. We constructed the scale for each factor by first standardizing the individual good practice items loading on the factor, and then computing the mean score. Only those respondents who completed 60% of the constituent items received a scale score.

"Good teaching and high quality interactions with faculty" was a 23-item scale (α = .92) that combined items from four subscales: a) faculty interest in teaching and student development (e.g., the extent to which faculty are interested in helping students grow in more than just academic areas), b) prompt feedback (e.g., how often faculty informed students of level of performance in a timely manner), c) quality and impact of non-classroom interactions with faculty (e.g., extent to which non-classroom interactions with faculty have had an impact on: intellectual growth), and d) overall exposure to clear and organized instruction (e.g., frequency that faculty give clear explanation).

"Academic challenge and high expectations" was a 31-item scale (α = .88) that combined items from four subscales: a) academic challenge and effort (e.g., how often one worked harder than one thought he or she could to meet an instructor's standards or expectations), b) frequency of higher-order exams and assignments (e.g., how often exams or assignments require students to write essays), c) challenging classes and high faculty expectations (e.g., how often faculty asked challenging questions in class), and d) integrating ideas, information, and experiences (e.g., extent to which one agrees that courses have helped him or her understand the historical, political, and social connections of past events).

"Diversity experiences" was a 9-item scale (α = .80) that combined items from two subscales: a) diversity experiences (e.g., extent to which one's institution encourages contact among students from different economic, social, and racial or ethnic backgrounds), and b) meaningful discussions with diverse peers (e.g., how often one had meaningful and honest discussions about issues related to social justice with diverse students).

"Influential interactions with peers" was a 9-item scale (α =.85) that combined items from a subscale and a single item: a) positive peer interactions (e.g., the student friendships one

has developed at the institution have been personally satisfying), and b) co-curricular involvement (number of hours per week spent in co-curricular activities).

"Frequency of interactions with faculty/professional staff" was a 9-item scale ($\alpha = .83$) that combined items from two subscales: a) frequency of interactions with faculty (e.g., how often one discussed grades or assignments with an instructor), and b) frequency of interactions with student affairs staff (e.g., how often one discussed a personal problem or concern with student affairs professions).

"Cooperative learning" was a 4-item scale (e.g., in classes, students taught each other in addition to faculty teaching). The scale had an internal consistency reliability of .70.

Additional details regarding the good practice scales and their constituent items can be found in Appendix A and B of the WNSLAE Research Methods paper at the [Institution's website].

Independent variable. The major independent variable in the study was institutional type, operationalized by three dichotomous variables representing research universities, regional institutions, and community colleges. Liberal arts colleges served as the reference group.

Control variables. Because of the methodological strength of the WNSLAE longitudinal design, the study was able to introduce a wide range of statistical controls not typically possible in cross-sectional studies. In this particular investigation, we controlled not only for student background and precollege characteristics, but also for other college experiences in addition to, and perhaps attributable to the type of institution attended. The student background and precollege characteristics included: gender (female was the reference group), race/ethnicity (African American, Asian/Pacific Islander, Latino, and Other vs. Caucasian), average parental education (a scale ranging from "did not finish high school" to "doctorate"), and tested

precollege academic preparation (ACT score, SAT equivalent score, or COMPASS equivalent score for community college students; score provided by each institution). In terms of other precollege characteristics and high school experiences, we included a measure of students' precollege academic motivation ($\alpha = .69$) and high school involvement ($\alpha = .58$).

To control for other college experiences that may have a confounding effect on students' exposure to, or experience of, good practices in undergraduate education, we included the following college experience variables: student lived in campus housing (vs. other) during the first year of college, total number of hours per week the student worked both on- and off-campus during the first year of college (eight response options from "zero" to "more than 30 hours"), and the liberal arts emphasis of the student's first year coursework (defined as the total number of courses during the first year of college taken in traditional liberal arts areas: Fine Arts, Humanities, and Languages, Mathematics/Statistics/Computer Science, Natural Sciences, and Social Science).

Data Analyses

For our analyses, we used a conceptual framework that hypothesized liberal arts colleges as having total, direct, and indirect effects on students' exposure to, or experience of, good practices in undergraduate education. To estimate these three effects, we conducted our analyses in two stages. In the first stage, we estimated the total effect of attending a liberal arts college on exposure to good practices. Figure 1 visually portrays the conceptual model guiding these analyses. As the figure indicates, each of the six good practice scales was regressed on the three dichotomous variables representing institutional type plus all student background and precollege characteristics specified in the section on control variables.

[Insert Figure 1 about here]

In the second stage, we decomposed this effect using path analysis techniques into the direct (or unmediated) effects of attending a liberal arts college on exposure to good practices. We present this visually in Figure 2. As the figure illustrates, the direct effects estimates of attendance at a liberal arts college are obtained by simply adding the battery of other college experiences to the total effects equations. The results from this set of equations also permit one to estimate the indirect effects of attendance at a liberal arts college on exposure to good practices (mediated through other college experiences) by subtracting the estimated direct effect from the total effect (Alwin & Hauser, 1975).

[Insert Figure 2 about here]

We also tested to see if the effect of attending a liberal arts college was the same for all students or if it differed by student background or precollege characteristics. In other words, we examined for the presence of conditional effects. We first created a series of cross-product terms, multiplying the institutional dichotomous variables by gender, parents' education, tested precollege academic preparation, academic motivation, and high school involvement. We added each of these blocks of cross-product terms to the regression model separately. A significant R^2 increase in the variance explained indicated the presence of conditional effects (Pedhazur, 1982). For those regressions where a significant R^2 was found between the full and the conditional models, we divided the sample into above and below the mean on the continuous measure (or into women and men for gender) and individually examined the nature of attending a liberal arts college compared to other institutional types on experiences of good practices.

It is important to note the students were not drawn from an individual random sample but were sampled from the institution where they attended college. Thus, institutions were our primary sampling unit and yet students were our unit of analysis. In these instances, it is critical

the data analysis method account for the “clustered” or “nested” nature of the data. Because students tend to be more like their peers within a school than with their counterparts between schools, failing to take into account the correlated nature of student residuals violates an OLS assumption (Ethington, 1997). This can result in artificially lower standard errors and erroneous significant relationships (Bryk & Raudenbush, 1992; Raudenbush & Bryk, 2001). To yield correct standard errors, we used the "svy" procedures in Stata to account for this complex sampling survey design.

Limitations

As with nearly all multi-institutional studies, the WNSLAE data have unequivocal limitations that should be kept in mind when interpreting the findings. First, although the overall sample included a broad range of different kinds of postsecondary institutions from 11 different states, the inclusion of only 19 institutions and the fact that institutions were not selected randomly means that one cannot necessarily generalize the results to the population of all four-year and two-year institutions in the United States. Indeed, because a major purpose of the WNSLAE was to estimate the impacts of liberal arts colleges and liberal arts education, liberal arts colleges were purposefully over-sampled in the study. In turn, due to lower numbers of students of color in private liberal arts colleges, our overall sample, although weighted to be representative of the actual institutional populations in the study, had a larger representation of White students (82%) than is found across the population of American postsecondary students. This situation was probably exacerbated by the fact that the two community colleges participating in the study were located in the Midwest and did not have the more typically large population of minority students (NCES, 2008).

A second limitation is the fact that not all students who participated in the first (precollege) data collection participated in the second (follow-up) data collection. The 68.5% persistence rate in the WNSLAE from the first to second data collections is quite consistent with other large longitudinal studies requiring a substantial amount of participation in terms of time and intellectual effort (see for example, the National Study of Student Learning, Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998). However, attrition from the first to second data collections is a major, if perhaps unavoidable, limitation of the study. Our weighting procedures adjusted the final sample for respondent bias by gender, race/ethnicity, tested precollege academic preparation, and institution; but this in no way guarantees that those students who dropped out of study after the first data collection would have responded in the same way as their counterparts who persisted in the study from the first to second data collection.

Finally, our statistical analysis of the data is not the only viable approach that could be employed to estimate the unique effects of liberal arts colleges on the experience of good practices. Another viable approach to correct for any selection effect might have been the use of propensity scores. In the case of the present study, propensity scores would balance a student who chose to attend a liberal arts college with a peer with the same propensity to choose a liberal arts college but who chose to attend a research university, regional institution, or community college. In a meta-analysis of research studies using both propensity scores and traditional regression approaches, Shah, Laupacis, Hux, and Austin (2005) found the two methods differed little in the strength or statistical significance of associations between treatment groups and outcomes and that propensity scores were often poorly implemented. Because of the longitudinal nature of our data, we were able to include background characteristic (race and parental education) and precollege measures (precollege tested academic preparation, academic

motivation, and high school involvement), that are not only substantially related to the experience of good practices in the WNSLAE data, but which are also demonstrated predictors of attending a liberal arts college versus another type of institution (Pascarella, Wolniak, Seifert, Cruce, & Blaich, 2005).

RESULTS

Total and Direct Effects

We present the estimated total and direct effects of liberal arts colleges (vs. other types of institutions) on good practices in undergraduate education in Table 2. Columns 1-4 in Table 2 show the total (columns 1 and 3) and direct (columns 2 and 4) effects on good practices relative to national research universities and regional institutions. Net of other causes, students attending liberal arts colleges had greater experiences of both "good teaching and high quality interactions with faculty" and "academic challenge and high expectations" than students at either research universities or regional institutions. The net advantages of liberal arts colleges on both good practice dimensions were somewhat more pronounced in relation to research universities than regional institutions. In comparison to research universities, liberal arts colleges had an average total effect advantage of about .50 of a standard deviation on good teaching and high quality interactions with faculty and about .34 of a standard deviation on academic challenge and high expectations. This compared to respective advantages on these two good practices of about .28 and .26 of a standard deviation relative to regional institutions. Interestingly, the addition of other college experiences in the direct effects equations (columns 2 and 4) had a negligible impact on either the magnitude or the statistical significance of the advantages accruing to students at liberal arts colleges. This suggests that the impacts of liberal arts colleges on "good teaching and high quality interactions with faculty" and "academic challenge and high expectations" are independent, not only of student background and precollege characteristics, but

also of whether or not one lived on campus, one's work responsibilities during college, and the liberal arts emphasis of the coursework one took. This suggests the other college experiences do not mediate many of the effects of attending a liberal arts college on good practices (see Baron & Kenny, 1986, for a discussion of mediating effects). Thus the influence of liberal arts colleges on experiences of good practice is not simply due to the fact they tend to enroll students who are more likely to live on campus, work less than their peers, and tend to take a greater number of courses in the traditional arts and science disciplines. Moreover, for research universities, the magnitude of attending a liberal arts college is more fully realized in the direct effects model, suggesting that including other college experiences brings out the full influence of attending a liberal arts college compared to a research university on experiences of "good teaching and high quality interactions with faculty" and "academic challenge and high expectations."

However, beyond "good teaching and high quality interactions with faculty" and "academic challenge and high expectations," liberal arts colleges had only chance advantages over research universities and regional institutions on most of the other measures of good practices. Although students at liberal arts colleges did report modest, but statistically significant total and direct advantages in cooperative learning experiences relative to their counterparts at regional institutions, there was no corresponding advantage relative to students at research universities. The parity among liberal arts colleges, research universities, and regional institutions on the "influential interactions with peers" and "frequency of interactions with faculty/professional staff" dimensions suggests that students have similar levels of interaction with their peers and interact with faculty and staff with about the same frequency, regardless of where they attend college.

[Table 2 about here]

Columns 5 and 6 in Table 2 summarize the estimated total and direct effects of liberal arts colleges on good practices relative to community colleges. Although we reiterate the caution concerning the representativeness of the community colleges in our sample, the findings are somewhat unexpected. Net of confounding influences, students at liberal arts colleges generally reported a higher level of diversity experiences, frequency of interactions with faculty/professional staff, and cooperative learning experiences than their counterparts at community colleges, although the total effect on frequency of interactions with faculty/professional staff was reduced to nonsignificance once residential patterns, work, and liberal arts coursework variables were added to the model. Despite liberal arts colleges displaying advantages on several of the good practice dimensions compared to community colleges, there was parity on "good teaching and high quality interactions with faculty," "academic challenge and high expectations," and "influential interactions with peers." In a secondary analysis, net of other factors, we found community college students reported exposure to significantly higher levels of good teaching and high quality interactions with faculty than did their counterparts at both research universities (effect size = .685 of a standard deviation) and regional institutions (effect size = .427 of a standard deviation).

Conditional Effects

Our tests for the presence of conditional effects yielded 13 statistically significant effects. Nine of 13 conditional effects (about 70%) tended to be compensatory in nature (see Table 3). That is, attending a liberal arts college (vs. another type of college) tended to foster the greatest impact on engagement in, or exposure to good practices for students who entered postsecondary education with lower levels of tested precollege academic preparation and motivation, high school involvement, or family educational background.

[Table 3 about here]

This compensatory effect is most evident if one considers the conditional effects of liberal arts colleges vs. research universities. Although liberal arts colleges had an overall advantage relative to research universities in good teaching and high quality interactions with faculty, the advantage was nearly 1.6 times as strong for students in the lower half of the distribution of tested precollege academic preparation compared to their counterparts in the upper half of the distribution. Moreover, the conditional effects related to liberal arts colleges vs. research universities also demonstrate how estimates of total and direct general effects can, at times, be misleading. As summarized in Table 2, liberal arts colleges had no general advantage over research universities in fostering the good practice dimensions of diversity experiences and cooperative learning. However, this masked statistically significant advantages of liberal arts colleges on both good practices for students who entered postsecondary education in the lower half of the distribution of tested precollege academic preparation. This finding is an example of how a student characteristic (e.g., precollege academic preparation) can moderate the effect of an environmental variable (e.g., attending a liberal arts college vs. research university) on an outcome (e.g., diversity experiences and cooperative learning).

With one exception, attending a liberal arts college in comparison to a regional institution maintained the pattern of compensatory conditional effects on good practices. Although students with above average levels of precollege academic motivation reported greater levels of academic challenge at liberal arts colleges than at regional universities, on the whole, attending a liberal arts college proved particularly beneficial to students with below average levels of high school involvement and tested precollege academic preparation. Students at liberal arts colleges who were involved in high school less than the average student reported more influential interactions

with their peers and more engagement with cooperative learning pedagogies than their peers at regional institutions. Similarly, students, at liberal arts colleges with lower than average levels of tested precollege academic preparation reported higher levels of cooperative learning in the classroom than their peers at regional universities.

Community colleges tend to be the entry point into higher education for many students who have relatively lower levels of parental education, tested precollege academic preparation, academic motivation, and high school involvement. With one exception, our findings suggest attending a liberal arts college proves to be more beneficial in terms of experiencing good practices in undergraduate education for students who begin their postsecondary path with lower levels of these types of social and cultural capital as well as academic preparation. Students with lower than average levels of precollege academic motivation at liberal arts colleges report less exposure to good teaching and high quality interactions with faculty than their peers at community colleges. Community colleges appear to provide a more structured and supportive learning environment for students with lower levels of precollege academic motivation than liberal arts colleges. However, attending a liberal arts college, compared to a community college, benefitted students with below average academic motivation in terms of academic challenge and high expectations; students with below average parental education reported greater levels of diversity experiences; and students with below average involvement in high school more frequently experienced cooperative learning pedagogies. The only conditional effect uncovered that did not involve these precollege characteristics was a conditional effect involving student gender. Although students attending liberal arts colleges had an overall advantage relative to community college students in cooperative learning experiences, men almost totally enjoyed the advantage.

DISCUSSION

In general, students attending a liberal arts college, compared to another type of institution, reported greater experiences of, or exposure to, good practices in undergraduate education. Because of the extensive controls employed in the study, these effects cannot be generally explained by differences in the background and precollege characteristics of students attending liberal arts colleges versus other institutional types. This study replicates key findings from previous research, extends the research to include community colleges, and uncovers important details embedded in the educational experience at liberal arts colleges. We discuss each of these in turn.

The significant net advantages of liberal arts colleges relative to both research universities and regional institutions on "good teaching and high quality interactions with faculty" and "academic challenge and high expectations" are remarkably consistent with the earlier findings of Pascarella and colleagues (2004, 2005) with data from the National Study of Student Learning conducted in the early to mid 1990s. This clearly supports the robustness of the findings across different student and institutional samples separated by over a decade in time. However, our findings suggest that the advantages accruing to liberal arts colleges (compared to research universities and regional institutions) center on the in-class academic experience with faculty and thus may no longer be as extensive as previously indicated. We found liberal arts college students did not report any advantage in their level of diversity experiences compared to their peers at research or regional universities. This finding does not replicate the positive results of attending a liberal arts college reported by Umbach and Kuh (2006) nor does it support the negative finding reported by Jayakumar (2007). Although additional research is needed to better understand the effects of liberal arts colleges on diversity experiences, the evidence is fairly clear

that liberal arts colleges provide an in-class academic experience with faculty that is based on challenge and interaction more so than research universities and regional institutions.

Since liberal arts colleges appear to provide the greatest exposure to good practices in undergraduate education as it relates to the in-class academic experience, it seems to reason that educational stakeholders at larger institutions should place a priority on organizing their institutions in ways that best foster the uniquely challenging and supportive in-class environment of liberal arts colleges. In some cases, large universities have responded with initiatives to create more human scale learning environments by creating learning communities, freshman interest groups (FIGs), and honors programs or intentionally building smaller spaces for students to gather (Kuh, Kinzie, Schuh, & Whitt, 2005). Yet the findings of this study corroborate the widely held belief that large-scale universities less than focused on creating ideal learning conditions for undergraduate education. In the context of an increasing national emphasis on accountability in higher education (see U.S. Department of Education, 2006; Voluntary System of Accountability [VSA], 2008), larger institutions would be well-served to redouble their efforts toward providing the most effective undergraduate educational environment. Since research universities, regional institutions, and community colleges educate the overwhelming majority of American undergraduates, a large scale effort to reshape the educational experience of students at these institutions may be just as important as providing them with the financial means to enroll.

Community college research has tended to examine the effects of student background characteristics on experiences at the community college, such as interactions with faculty and peer relations (Chang, 2005; Hagedorn, Maxwell, Rodriquez, Hocevar, & Fillpot, 2000). However, past research has not compared overall community college students' experiences of

good practices to their four-year college peers. To our knowledge, this study is the first to do so. Our findings suggest that the supportive, yet challenging, learning environment characterized by good teaching and an engaged faculty long associated with liberal arts colleges is equally present at community colleges. Despite lower levels of engagement with diversity experiences and cooperative learning pedagogies (of which the former may be due to the homogeneity of students at community colleges in this sample), community colleges did not differ from liberal arts colleges on either good practice measure related to the in-class academic experience with faculty. Given the connection between these good practice dimensions and student learning (Cruce et al., 2006), our findings suggest that community colleges are creating environments that promote student learning on par with liberal arts colleges although we reiterate our earlier caution based on the small number of community colleges in the sample.

With community colleges educating 50% of all U.S. postsecondary students (Laanen, 2001) and disproportionately educating under-represented students (Bragg, 2001; NCES, 2008.) or those students with lower levels of social and cultural capital, these findings indicate that community colleges, overall, appear to be creating the kind of educational conditions that best fulfills their democratic mission. Policy makers need to recognize the critical role of community colleges in successfully educating student less likely to pursue higher education by investing in the resources and the personnel necessary to ensure that all community college students experience the learning conditions most likely to foster success.

Lastly, this study adds substantial depth and detail to our understanding of the conditions that make a liberal arts college experience unique and advantageous. Specifically, these findings suggest that the positive effects of liberal arts colleges on good practices may often be conditional rather than general. That is, the advantages in exposure to good practices fostered by

liberal arts colleges may be more likely to accrue to subgroups of students, particularly those who enter postsecondary education with lower levels of parental education, tested precollege academic preparation, academic motivation, and high school involvement. These compensatory effects advantaged students at liberal arts colleges who entered college with lower than average levels on these background and precollege characteristics compared to their peers at research universities, regional institutions, and community colleges. This adds substantial nuance to previous research suggesting that the influence of attending a liberal arts college on good practices is the same for all students (Pascarella et al., 2005).

These results have several important implications for the higher education community. First, they provide empirical evidence to support the century old claims of many liberal arts advocates. Faculty at any type of institution can teach course content but liberal arts colleges' commitment to creating a challenging, yet supportive, learning environment sets them apart, particularly as this environment facilitates learning for students who approach postsecondary education with the greatest challenges (e.g., lower tested precollege academic preparation, motivation, and history of involvement with faculty and peers). Indeed, providing these students with the legitimate opportunity to succeed in college may require more than simply providing access. It likely requires a true institutional commitment to foster an environment based on high expectations, academic challenge and support for all students, and a dedication to undergraduate teaching and learning.

Given that attending a liberal arts college appeared to be particularly beneficial for those students who came to college with the greatest challenge, our findings add a sadly ironic twist to the efforts by many liberal arts colleges to improve their place in the popular national rankings published by U.S News & World Report, the Princeton Review, and others. By increasing an

institution's selectivity index (and therefore, one's overall rank), applicants who might demonstrate lower tested precollege academic preparation, less motivation, or less high school involvement are less likely to be accepted into the very institutions best suited to provide them with the educational environment vital to their ultimate success. In addition, this disconnect of educational conditions may be perpetuated by the continued growth of honors programs at large research universities and regional institutions. While such programs may provide meaningful experiences for the students who participate in them, in the context of an institution with limited resources, these findings suggest that institutions that invest in such narrowly targeted programs at the expense of other more inclusive educational conditions are in effect widening, rather than closing, the educational gap since the students who might benefit the most from increased exposure to educational good practices are those on the opposite end of the spectrum from the elite students for whom honors programs are designed.

Second, given that Cruce and colleagues (2006) found exposure to good practices to be powerful predictors of learning outcomes, our results add an important dimension to the national conversation regarding accountability for learning outcomes. To the extent that institutions choose to emphasize and reward their faculty and staff for creating environments that embody classroom-based good practices, it seems likely that student learning will be positively influenced. Our findings suggest that efforts focused on learning outcome accountability may benefit more from improving learning environments that enhance learning than focusing solely on outcome attainment such as graduation rates (see VSA, 2008). Particularly for the large numbers of undergraduates who attend a research university or regional institution and are not among the academic elite, there is little evidence that simply identifying targeted outcomes

without fundamentally changing the learning environment is a commendable strategy for maximizing student success.

Advocates of liberal arts colleges will likely see these results as providing empirical evidence to support their longstanding claims of educational distinction. Although our findings replicate previous research in terms of the in-class academic environment nurtured by liberal arts college faculty, other critical dimensions of the learning environment (e.g., interactions with peers, diversity experiences, and the frequency of interactions with faculty/professional staff) were more similar across institutional types than different. These similarities persist despite the generally smaller size and residential nature of liberal arts college campuses. This research provides educational stakeholders, regardless of institutional type, information from which they can intentionally reconsider the learning environment they create for students. A careful reconsideration will call on stakeholders to first wrestle with the question, does the current environment best promote student learning, and then act in ways that foster institutional improvement.

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TABLE 1 (continued)

Variable Name	Operational Definition	Mean	SD	Min	Max
Community college	Institutional type, coded 1=community college; 0 all others	0.14	NA	0	1
Liberal arts college (reference group)	Institutional type, coded 1=liberal arts college; 0 all others	0.25	NA	0	1
Other college experiences					
Lives on-campus	Residential living pattern, coded 1=lives on-campus; 0=lives off-campus	0.77	NA	0	1
Hours worked on and off-campus	Sum of two work variables, coded as 1=Did not work; 2=1-5 hours; 3=6-10 hours; 4=11-15 hours; 5=16-20 hours; 6=21-25 hours; 7=26-30 hours; 8=More than 30 hours.	3.67	2.11	2	16
Number of traditional arts & science courses in first year*	Total number of courses taken the first year in the following areas: arts & humanities, social sciences, natural sciences, and mathematics.	6.28	2.17	0	20
Good practices: Educational practices and conditions					
Good teaching and high quality interactions with faculty	23-item scale focusing on the areas of: faculty interest in teaching and student development; prompt feedback; quality of non-classroom interactions with faculty; and teaching clarity and organization. $\alpha = .92$	-0.08	0.6	-3.46	1.4

TABLE 1 (continued)

Variable Name	Operational Definition	Mean	SD	Min	Max
Academic challenge and high expectations	31-item scale on the areas of: academic challenge and effort; frequency of higher-order exams and assignments; challenging classes and high expectations; and integration of ideas, information, and experiences. α = .88	-0.07	0.46	-2.26	1.36
Interactions with peers	9-item scale focusing on the areas of: number of hours engaged in co-curricular activities; degree of positive peer interactions. α = .85	-0.08	0.68	-2.81	1.35
Diversity experiences	9-item scale focusing on the areas of: diversity experiences and meaningful discussions with diverse peers. α = .80	-0.11	0.62	-1.39	1.95
Frequency of interacting with faculty/professional staff	9-item scale focusing on the areas of: frequency of interactions with faculty; frequency of interactions with student affairs staff. α = .83	-0.05	0.65	-1.18	2.27
Cooperative learning	4-item scale focusing on: students teaching each other; encouragement to participate in study groups; participation in study groups; working with other students on projects outside of class. α = .70.	-0.14	0.77	-1.91	1.68

TABLE 2

Estimated Total (T) and Direct (D) Effects of Attending a Liberal Arts College on Good Practices in Undergraduate Education

Good Practice Dimension	Liberal Arts Colleges vs. Research Universities		Liberal Arts Colleges vs. Regional Institutions		Liberal Arts Colleges vs. Community Colleges	
	(1) T[a]	(2) D[b]	(3) T[a]	(4) D[b]	(5) T[a]	(6) D[b]
Good teaching and high quality interactions with faculty (SD = .601)[c]	.298** (.496)	.319** (.531)	.170** (.283)	.164** (.273)	-.108	-.093
Academic challenge and high expectations (SD = .464)[c]	.156* (.336)	.169* (.364)	.120** (.259)	.117* (.252)	.094	.111
Influential interactions with peers (SD = .677)[c]	.071	.062	.073	.047	.205	.024
Diversity experiences (SD = .621)[c]	.146	.160	.100	.080	.300** (.483)	.230** (.370)
Frequency of interactions with faculty/professional staff (SD = .652)[c]	.082	.079	.080	.067	.220** (.337)	.159
Cooperative learning (SD = .721)[c]	.049	.080	.155* (.215)	.137* (.190)	.342** (.474)	.248* (.344)

TABLE 2 (continued)

[a] Regression equations also include controls for: gender, race/ethnicity (African American, Asian/Pacific Islander, Latino, and other vs. White), average parents' education level, tested precollege academic preparation, academic motivation, and high school involvement.

[b] Regression equations also include controls for all variables listed in superscript "a" above, plus place of residence during college (on- or off-campus), hours of on- and off-campus employment per week, and number of liberal arts courses (i.e., fine arts, humanities, languages, natural sciences, social sciences, and mathematics) taken during the first year of college.

[c] The top number is the metric regression coefficient. The metric regression coefficient represents the average difference between liberal arts college students and comparison institution students on each good practice dimension, statistically adjusted for the clustering effect and for all controls listed in superscripts "a" or "b." The number in parentheses is the effect size, or the metric regression coefficient divided by the pooled standard deviation of the good practice dimension. Thus, the effect size indicates that fraction of a standard deviation that liberal arts colleges are advantaged or disadvantaged (depending on the sign) relative to the comparison institutions. Only effect sizes associated with statistically significant metric regression coefficients are reported. All others are considered zero.

*$p < .05$. **$p < .01$.

TABLE 3

Estimated Conditional Effects of Attending a Liberal Arts College on Good Practices in Undergraduate Education[a]

Institutional Type Comparison: Good Practice Dimension	Comparison Group	Metric Regression Coefficient
Liberal Arts Colleges vs. Research Universities:		
Good teaching and high quality interactions with faculty	Above mean of tested precollege academic prep.	.261** (.434)
	Below mean of tested precollege academic prep.	.410** (.682)
Diversity experiences	Above mean of tested precollege academic prep.	.044
	Below mean of tested precollege academic prep.	.294** (.473)
Cooperative learning	Above mean of tested precollege academic prep.	-.058
	Below mean of tested precollege academic prep.	.211** (.293)
Liberal Arts Colleges vs. Regional Institutions:		
Academic challenge and high expectations	Above mean of academic motivation	.194** (.418)
	Below mean of academic motivation	.080
Influential interactions with peers	Above mean of high school involvement	-.041
	Below mean of high school involvement	.157** (.232)

TABLE 3 (continued)

Institutional Type Comparison: Good Practice Dimension	Comparison Group	Metric Regression Coefficient
Cooperative learning	Above mean of high school involvement	.092
	Below mean of high school involvement	.180* (.250)
	Above mean of tested precollege academic prep.	.090
	Below mean of tested precollege academic prep.	.206** (.286)
Liberal Arts Colleges vs. Community Colleges:		
Good teaching and high quality interactions with faculty	Above mean of academic motivation	.137
	Below mean of academic motivation	-.258* (-.429)
Academic challenge and high expectations	Above mean of academic motivation	.059
	Below mean of academic motivation	.195* (.420)
Diversity experiences	Above mean of parents' education	-.032
	Below mean of parents' education	.341** (.549)

TABLE 3 (continued)

Institutional Type Comparison: Good Practice Dimension	Comparison Group	Metric Regression Coefficient
Cooperative learning	Above mean of high school involvement	.205
	Below mean of high school involvement	.401** (.556)
	Above mean of tested precollege academic prep.	1.066** (1.478)
	Below mean of tested precollege academic prep.	.255* (.354)
	Men	.527** (.731)
	Women	.032

[a] Depending on the subsample analysis, regression equations also include controls for: gender, race/ethnicity (African American, Asian/Pacific Islander, Latino, and other vs. White), parents' education level, tested precollege academic preparation, academic motivation, high school involvement, place of residence during college (on- or off-campus), hours of on- and off-campus employment per week, and number of liberal arts courses (i.e., fine arts, humanities, languages, natural sciences, social sciences, and mathematics) taken during the first year of college. If the sample was divided based on the above and below mean score on parents' education level, for example, parents' educational level was not included in the regression equation. The top number is the metric regression coefficient and the number in parentheses is the effect size. Only statistically significant effect sizes are shown. All others are considered zero.

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

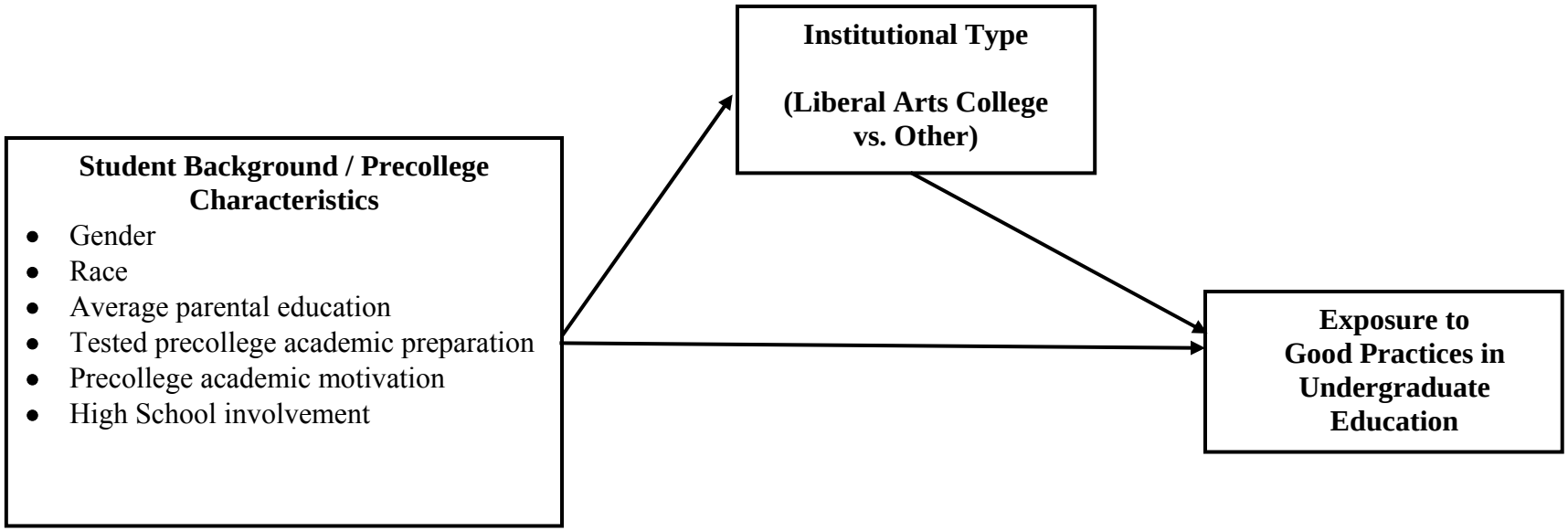

FIGURE 1. Total Effects Model

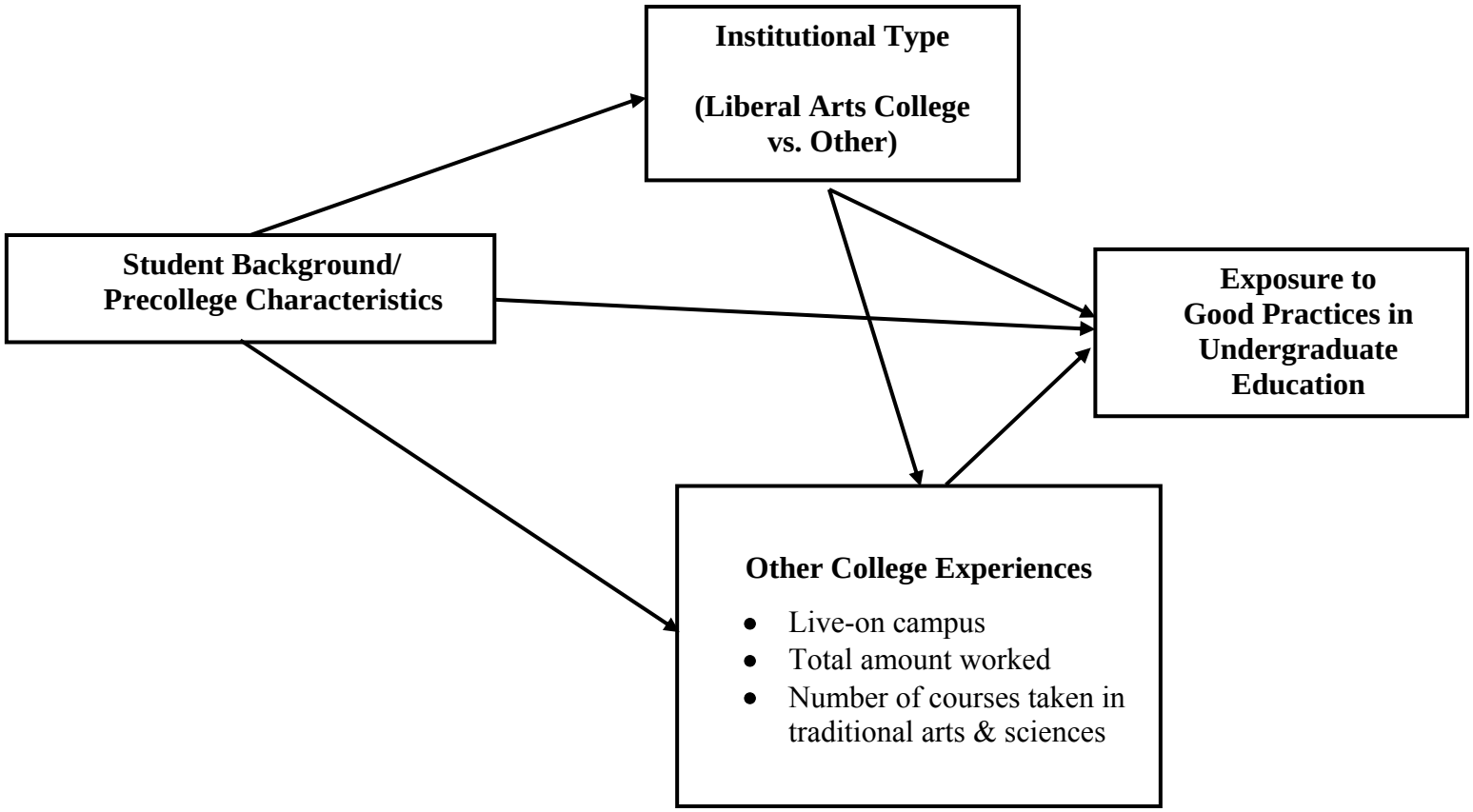

FIGURE 2. Direct and Indirect Effects Model