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Ernest T. Pascarella, Linda Serra Hagedorn, Marcia Edison, Patrick T. Terenzini, Amaury Nora

In this study researchers tested the hypothesis that community college attendance lowers students’ precollege plans to obtain a bachelor of arts degree. In the presence of controls for precollege plans, other background factors, and college academic and nonacademic experiences, community college students initially planning to obtain a bachelor of arts degree were between 20% and 31% more likely than similar four-year college students to lower their plans below a bachelor of arts degree by the end of the second year of college.

A major critique of the two-year community college posits that, although it may largely guarantee equality of opportunity for access to postsecondary education, it has not, in relationship to four-year colleges and universities, provided equal opportunity in terms of the outcomes of postsecondary education (Brint & Karabel, 1989; Grubb, 1984; Karabel, 1986). A recent body of research, however, has called into question the notion that two-year college students are at a distinct disadvantage in terms of the cognitive or labor market outcomes of postsecondary education. For example, when initial ability and other important confounding influences were controlled statistically, students in two-year colleges appeared to make about the same gains in standardized measures of reading comprehension, mathematics, critical thinking, writing skills, and science reasoning as their student counterparts in four-year institutions (Bohr et al., 1994; Pascarella et al., 1995, 1995-1996; Terenzini et al., 1994). Similarly, the weight of evidence suggests that, when individuals of equal educational attainment and background characteristics are compared, there is a general parity between those initially enrolling in two-year and four-year colleges in such areas as job prestige, earnings, job stability, unemployment rate, or job satisfaction (Anderson, 1984; Pascarella & Terenzini, 1991; Smart & Ethington, 1985; Whitaker & Pascarella, 1994).

There seems to be little debate, however, that in the particularly crucial area of educational attainment students initially enrolling in two-year colleges are in fact significantly disadvantaged relative to similar students starting at four-year institutions (Kinnick & Kempner, 1988). Here the weight of evidence has indicated that two-year college students seeking a bachelor of arts degree are about 15% less likely to complete that degree in the same amount of time as similar students starting at four-year colleges are in fact significantly disadvantaged relative to similar students starting at four-year institutions (Kinnick & Kempner, 1988). 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for the occupational and economic mobility of students in two-year colleges.

Scholars have suggested a number of explanations for why beginning postsecondary education at a two-year college tends to inhibit degree attainment. One explanation tends to be largely structural and focuses on the difficulties involved in transferring from a two-year to a four-year institution to complete one's degree. Problems in securing acceptance, obtaining financial aid, and transferring credits can pose nontrivial administrative obstacles in transferring from two-year to four-year institutions (Dougherty, 1992, 1994; Grubb, 1991; Nora, 1993; Nora & Rendon, 1990). A related problem involves adjusting to the academic demands and unfamiliar social milieu of a four-year institution subsequent to transfer. Problems in such adjustment perhaps partially explain why a significant number of two-year college students experience a drop in grades after transferring (Dougherty, 1992, 1994; Kintzer & Wattenbarger, 1985).

A second explanation, and one which precipitated the research reported in this paper, concerns the role that two-year colleges themselves play in lowering students' educational aspirations and goals (Brint & Karabel, 1977; Karabel, 1972, 1974, 1986). As an explanation for the negative influence of two-year college attendance on bachelor of arts degree completion, the cooling-out hypothesis has a considerable logical appeal. A review of existing literature, however, suggested that the hypothesis has yet to be tested directly. In this paper we report the results of a study in which we sought to test, at least preliminarily, the cooling-out hypothesis by estimating the extent to which two-year college attendance is linked to the lowering of educational plans. Specifically the study had two purposes. First, we attempted to determine the net impact of two-year versus four-year college attendance on students' lifetime educational plans after 1 and after 2 years of college. Second, we sought to determine if the net impact on lifetime educational plans of two-year versus four-year college attendance differ in magnitude for different kinds of students (e.g., students differing in ethnicity, gender, family socioeconomic origins, precollege academic ability, and precollege educational plans).

**METHOD**

**Institutional Sample**

The sample was selected from incoming first-year students at 18 four-year and 5 two-year institutions located in 16 states throughout the country. Institutions were selected from the National Center on Education Statistics Integrated Postsecondary Education Data System (IPEDS) to represent a variety of colleges and universities in terms of institutional type and control (e.g., private and public research universities, private liberal arts colleges, private and public comprehensive universities, historically Black colleges, and two-year colleges), size, location, commuter versus residential character, and the ethnic distribution of the undergraduate student body. The two-year colleges included three located in large metropolitan areas (one on the West Coast, one in New England, and one in the Carolinas), and two located in or near smaller communities (one in a Midwestern state and one in a Rocky Mountain state). The four-year college sample included: three public research universities (two located in urban areas and one private research university; four liberal arts colleges in a small town and one located in a rural area; eight regional colleges in urban areas and four in historically Black college areas). The 18 four-year institutions were selected from the 23 institutions that participated in the National Center on Education Statistics Institutional Sample and Institutional Sample.

The first follow-up study of Student Learning (NSW) was selected randomly from each year class at each participating institution; the sample would be participating in the study of student learning. Participants were selected from the national sample of students who receive cash stipends for each data collection ($25) for confidentiality and would have their institutional records destroyed.

An initial 3-hour survey was conducted in the Fall of 1996 in 23 institutions that were selected using a college survey that gathered student demographic information, student lifetime educational plans, student expectations for and satisfaction with their college experience, and the academic preparation, or ACT Composite tests as an estimate of precollege academic ability, and the ethnic distribution of the undergraduate student body. The two-year colleges included three located in large metropolitan areas (one on the West Coast, one in New England, and one in the Carolinas), and two located in or near smaller communities (one in a Midwestern state and one in a Rocky Mountain state). The four-year college sample included: three public research universities (two located in urban areas and one private research university; four liberal arts colleges in a small town and one located in a rural area; eight regional colleges in urban areas and four in historically Black college areas). The 18 four-year institutions were selected from the 23 institutions that participated in the National Center on Education Statistics Institutional Sample and Institutional Sample.

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Student Educational Plans

The individuals in the overall sample were 1,645 students who participated in both the first-year and second-year follow-ups of the National Study of Student Learning (NSSL). The initial sample was selected randomly from the incoming first-year class at each participating institution. The students in the sample were informed that they would be participating in a national longitudinal study of student learning and that they would receive cash stipends for their participation in each data collection ($25, $35, and $45, respectively). They were also informed that the information they provided would be kept confidential and would never become part of their institutional record.

An initial 3-hour data collection was conducted in the Fall of 1992, with 3,840 students from the 23 institutions participating. The data was collected using an NSSL-designed pre-college survey that gathered information on student demographic characteristics and background, student lifetime educational plans, student expectations of college, and a series of items assessing the students' orientations toward learning. Participants also completed the reading comprehension, mathematics, and critical thinking modules of the Collegiate Assessment of Academic Proficiency (CAAP). The CAAP was developed by the American College Testing Program (ACT) specifically to assess selected general skills acquired by students during the first 2 years of college (ACT, 1991). Each of the CAAP modules requires 40 minutes, and we employed a composite score based on all three tests as an estimate of a student's level of academic preparation, or aptitude, upon entrance to postsecondary education.

The first follow-up testing of the NSSL sample took place in the Spring of 1993. This data collection required about 3 1/2 hours and included different forms of the CAAP modules, Pace's (1984, 1990) College Student Experiences Questionnaire (CSEQ) to measure students' first-year experiences in college, and a specially designed NSSL survey form assessing aspects of students' first-year experiences and lifetime educational plans not covered by the CSEQ. Of the original sample of 3,840 students who participated in the Fall 1992 data collection, 2,685 participated in the Spring 1993 follow-up, for a response rate of 69.9%.

A second follow-up testing of the NSSL sample took place in the Spring of 1994. This data collection required about 2 1/2 hours and closely paralleled the first follow-up data collection. Students completed the writing skills and science reasoning modules of the CAAP, the CSEQ to measure students' second-year experiences in college, and a specially designed NSSL survey form assessing aspects of students' second-year experiences and lifetime educational plans not covered by the CSEQ. Of the 2,685 students who participated in the first follow-up (Spring 1993), 1,761 participated in the second follow-up (Spring 1994), for a response rate of 65.6%.

Testing the major hypothesis of the study essentially involved asking whether or not students, over time, lower their initial plans to obtain a bachelor of arts degree. Consequently, the sample employed in all our analyses was limited to those two-year and four-year college students who, upon entrance to postsecondary education (i.e., on the Fall 1992 precollege testing), indicated that they planned to obtain at least a bachelor of arts degree in their lifetime. The sample was further limited to those students who participated in both the first and second follow-up data collections. Thus, the final sample was 1,645 students, 119 of whom attended the 5 two-year colleges and 1,526 of whom attended the 18 four-year colleges in the NSSL database.

Over the 2 years of the investigation the drop-out rates for the two-year and the four-year college samples differed. Two-year college students were more likely to drop out of the study than were four-year college students. (Indeed, the
average response rates across the 2 years of the study were 69.68% for the four-year college sample and 54.25% for the two-year college sample.) However, no evidence indicated that the differential drop-out rates between institutional types led to any significantly greater bias by race, gender, or precollege ability in the two-year college sample than it did in the four-year college sample. Nevertheless, to adjust for potential response bias by gender, ethnicity, and institution, a sample weighting algorithm was developed for each year of the study.

**Weighted Sample.** Specifically, within each of the 23 institutions participants in the follow-up data collection were weighted up to the institution’s population by gender (male or female) and ethnicity (African American, Caucasian, Hispanic, other). (The *other* category consisted of Asian, Pacific Islander, Native American, etc.) Thus, for example, if an institution had 100 African American men in the first-year class and 25 African American men in the sample, each African American male in the sample was given a sample weight of 4.00. An analogous weight was computed for participants falling within each gender x ethnicity cell within each institution. The purpose of weighting the sample in this manner was to apply an adjustment for response bias, not only by gender and ethnicity, but also by institution. Thus, where necessary within each gender x ethnicity cell, two-year college students were given greater weight in the analyses to adjust for the higher drop-out rate in the two-year college sample. An analogous weighting algorithm was developed in the second year of the study that also adjusted for sample response bias by gender, ethnicity, and institution.

Because a sample based on only 23 institutions (even if representative of those institutional populations) could be biased with respect to the national populations of students in American two-year and four-year institutions, an additional weighting algorithm was developed. This algorithm weighted the sample up to the national populations of students entering American postsecondary institutions in Fall 1992 by gender, ethnicity (African American, Caucasian, Hispanic, other) and institutional type (two-year and four-year). The template for this weighting algorithm was *Enrollment in Higher Education: Fall 1986 Through Fall 1994* (National Center for Education Statistics, 1996). Table 1 compares the distributions of weighted sample estimates and the national populations of full-time and part-time students entering postsecondary education in 1992.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Sample Weighted to Institutional Populations</th>
<th>Sample Weighted to National Populations</th>
<th>National Population*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-Year</td>
<td>2-Year</td>
<td>4-Year</td>
</tr>
<tr>
<td>African American</td>
<td>11.8</td>
<td>14.2</td>
<td>12.2</td>
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<tr>
<td>Caucasian</td>
<td>69.7</td>
<td>69.4</td>
<td>67.1</td>
</tr>
<tr>
<td>Hispanic</td>
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<td>7.5</td>
<td>15.3</td>
</tr>
<tr>
<td>Otherb</td>
<td>9.7</td>
<td>8.9</td>
<td>5.4</td>
</tr>
</tbody>
</table>

* Source: National Center for Education Statistics (1996); excluding nonresident aliens
b e.g., Asian American, Native American

Table 1 compares the distributions by ethnicity, gender, and institutional type for the weighted samples to the national populations estimated by the National Center for Education Statistics (1996), as indicated, the study sample fits the 23 institutional populations fairly well, with somewhat lower percentages of Hispanic and African American students and somewhat higher percentages of Caucasian students of color than the national population. On the other hand, the study sample to the national population of percentages by gender and ethnicity is reasonably close to the national population.

Another indication of the quality of the weighted two-year sample is by the distribution of students by family income levels. According to the 1991 Family Income Supplement (p. 4), 10.1% of students in two-year institutions had family incomes of $25,000 or more. 11.1% came from families of $75,000 or more. In the two-year sample, up to the institutional population, 5.1% of the sample had family incomes less than $15,000 and 13.6% had family incomes of $75,000 or more.

**Unweighted sample.** did not differ dramatically when weighted up to the institutional population. Two-year colleges the percentage of African American students was 12.2% African American, 9.2% Hispanic, and 10.1% Caucasian. One-year college students the final percentage of African American students was 14.5% African American, 15.4% Hispanic, and 6.1% Caucasian.

**Variables.** The dependent variable of interest was the first-year and educational plan dichotomy: bachelor of arts degree or less than a bachelor degree. The independent variable whether or not a student was a "minority."

Table 1 compares the percentage distributions by ethnicity, gender, and institutional type for the weighted samples from this study and the national populations estimated by the National Center for Education Statistics. As the Table indicates, the study sample weighted up to the 23 institutional populations tended to have somewhat lower percentages of Caucasian students and somewhat higher percentages of students of color than the national populations. On the other hand the study sample weighted up to the national populations tended to have ethnic percentages by gender and institutional type reasonably close to those of the national population.

Another indication of the representativeness of the weighted two-year samples is indicated by the distribution of students from different income levels. According to Dougherty (1994, p. 4), 10.1% of students in two-year colleges had 1991 family incomes of less than $15,000, and 11.1% came from families having 1991 incomes of over $75,000. In the two-year sample weighted up to the institutional populations 8.6% reported family incomes less than $15,000 and 12.6% reported family incomes of $75,000 or more. In the two-year sample weighted up to the national population 8.1% reported family incomes less than $15,000 and 13.6% reported incomes of $75,000 or more.

Unweighted sample. The unweighted sample did not differ dramatically from the sample weighted up to the institutional populations. For four-year colleges the final unweighted sample was 12.2% African American, 67.8% Caucasian, 9.2% Hispanic, and 10.8% Other. For the two-year colleges the final unweighted sample was 14.5% African American, 63.3% Caucasian, 15.4% Hispanic, and 6.8% Other.

Variables
The dependent variables in the study were end-of-first-year and end-of-second-year lifetime educational plans dichotomized into two categories: bachelor of arts degree or above (coded 1) and less than a bachelor of arts degree (coded 0). The independent variable in the study was whether or not a student attended a two-year institution (coded 1) or a four-year institution (coded 0).

Guided by conceptual models for validly assessing college impact (e.g., Astin, 1993; Chickering, 1969; Tinto, 1975), we also introduced a number of salient confounding variables into our model for testing the cooling-out hypothesis. These were: initial or precollege lifetime educational plans, precollege academic ability, precollege academic motivation, gender, ethnicity, age, family socioeconomic origins, cumulative credit hours taken, hours worked per week, on-campus or off-campus residence, and cumulative self-reported grades. Although its constituent items were based on existing research on academic motivation (e.g., Ball, 1977), the precollege academic motivation scale had an internal consistency reliability of only .65. We included it in the regression models, however, for two reasons: first, we felt that it was important to control for differences in students' academic motivation; and second, a reliability of .65 is acceptable for the kinds of group comparisons we were making in the study (Thorndike & Hagen, 1977). Additionally, we thought that some students entering two-year colleges who indicated that they planned to obtain at least a bachelor of arts degree might not be enrolled in academic programs that adequately prepared them to transfer to a 4-year institution. Consequently, the study also sought to control for differences in the content and emphasis of academic programs. This was operationalized by the cumulative number of courses taken during the first 2 years of college in five areas (social science, mathematics, technical or preprofessional, arts and humanities, and natural sciences and engineering). Place of residence and cumulative self-reported grades for the first and second year of the study were taken from the College Student Experiences Questionnaire. All other information was taken either from the NSSL precollege survey or the NSSL first or second follow-up surveys. Operational definitions of all variables are provided in Table 2.

Analytic Procedures
The data analysis was carried out in three stages. In the first stage simple 2 x 2 cross-tabulations
TABLE 2
Variable Definitions

Precollege Educational Plans: A single-item measure asking students to indicate the highest academic degree they intended to obtain in a lifetime. Coded: 1 = bachelor of arts degree, 2 = master of arts degree, 3 = Ph.D., Ed.D. or advanced professional degree (e.g., LLB or JD, MD, DDS, DVM).

Precollege Academic Ability: A composite of the reading comprehension, mathematics, and critical thinking modules of the Collegiate Assessment of Academic Proficiency (CAAP), developed by the American College Testing Program, alpha reliability = .83.

Precollege Academic Motivation: An 8-item, Likert-type scale (5 = strongly agree to 1 = strongly disagree) with an internal consistency reliability of .65. The scale items were based on existing research on academic motivation (e.g., Ball, 1977). Examples of constituent items are: "I am willing to work hard in a course to learn the material, even if it won’t lead to a higher grade," “When I do well on a test it is usually because I was well prepared, not because the test was easy,” “In high school I frequently did more reading in a class than was required simply because it interested me,” and “In high school I frequently talked to my teachers outside of class about ideas presented during class.”

Female: Coded: 1 = female, 0 = male.

Non-White: Coded: 1 = non-White, 0 = White.

Age: A continuous variable calculated by subtracting year of birth from 1992.

Family Social Origins: A combination of standardized measures of mother’s and father’s level of formal education and combined family income.

Total Credit Hours Completed: Cumulative number of credit hours completed through the first or second year of college.

Hours Worked Per Week: Combination of average number of hours of on-campus and off-campus work per week during the school year. Coded: 1 = none to 9 = more than 35 (computed separately for the first and second years of college).

On-Campus Residence: 1 = lived on campus, 0 = lived off campus (computed separately for the first and second years of college).

Self-Reported Grades: Self-reported cumulative grades through the first or through the second year of college. Coded: 5 = A to 1 = C, C–, or lower.

Social Sciences Courses Taken: Cumulative number of courses taken through the first or the second year of college in anthropology, sociology, psychology, sociology, or social work.

Mathematics Courses Taken: Cumulative number of courses taken through the first or the second year of college in algebra, prealgebra, geometry, algebra, accounting, or business math.

Technical or Preprofessional Courses Taken: Cumulative number of courses taken through the first or the second year of college in drafting, drafting, architectural design, criminology, education, agriculture, business, physical therapy, pharmacy, physical education, nursing, or computer programming.

Arts and Humanities Courses Taken: Cumulative number of courses taken through the first or the second year of college in art history, art appreciation, studio art, dance, theater, music appreciation, music performance, composition or writing, English literature, foreign language, humanities, philosophy, linguistics, classics, or religious studies.

Natural Sciences and Engineering Courses Taken: Cumulative number of courses taken through the first or through the second year of college in astronomy, botany, biology, chemistry, physics, geology, zoology, microbiology, and engineering.

Attended a Two-Year College: Coded: 1 = attended a two-year college, 0 = attended a four-year college.

Dependent Measures

End-of-First-Year or End-of-Second-Year Educational Plans: A single-item measure asking students to indicate the highest academic degree they intended to obtain in a lifetime. Recoded to: 1 = bachelor of arts degree or above (i.e., bachelor of arts, master of arts, doctorate, or advanced professional degree) and 0 = less than a bachelor of arts degree (i.e., associate degree, vocational certificate, or none).

RESULTS

Cross Tabulations (See Table 2 for Definition of Variables)
With the sample weighted by institutional populations the chi-square test of independence between attending a two-year versus a four-year college at the end of the first year of college education (Spring 1992) and educational plans both indicated significant differences between attending a two-year versus four-year college students who at the end of the first year of college education (Spring 1992) had planned to obtain a bachelor of arts degree or above (i.e., bachelor of arts, master of arts, doctorate, or advanced professional degree) and less than a bachelor of arts degree (i.e., associate degree, vocational certificate, or none).
were computed to determine any relationship between attending a two-year versus a four-year college and the likelihood of lowering one’s lifetime educational plans below a bachelor of arts degree at the end of the first and second years of college. The second stage of the analyses employed logistic regression procedures to determine if any nonchance relationships between attending a two-year versus a four-year college and end of first-year and second-year educational plans persisted in the presence of controls for the 16 confounding variables specified above. In the third stage of the analyses we added a series of cross-product terms to the logistic regression model to determine if the magnitude of the impact on educational plans of attending a two-year versus a four-year college differed for students with different background (precollege) characteristics. The background or precollege characteristics considered were: gender, ethnicity, age, academic ability, family social origins, and precollege educational aspirations.

Parallel analyses were conducted with the weighted and unweighted samples with essentially the same results. The remainder of the paper, however, focuses on the results from the two weighted samples (adjusted to the actual unweighted sample size to obtain correct standard errors). Because of the relatively large unweighted sample size (N = 1,645) the critical alpha was set at 0.01 for all analyses. (Results of the unweighted analyses are summarized in a separate section.)

RESULTS
Cross Tabulations (Sample Weighted to Institutional Populations)

With the sample weighted up to the 23 institutional populations the cross-tabulations for end-of-first-year and end-of-second-year educational plans both indicated significant relationships with two-year versus four-year college attendance. At the end of the first year of postsecondary education (Spring 1993) 11.8% of two-year college students who at entrance to college (Fall 1992) had planned to obtain at least a bachelor of arts degree reported that they now planned on obtaining less than a bachelor of arts degree in their lifetime. This compared to 5.2% of students attending a four-year institution (χ² = 8.98 with 1 degree of freedom, p < .01). The same comparison at the end of the second year of postsecondary education was even more dramatic. Of the two-year college students who initially planned to obtain a bachelor of arts degree or higher 22.8% lowered their lifetime educational plans to less than a bachelor of arts degree by the end of the second year of college. This compared to 4.2% of the students attending a four-year college or university (χ² = 66.54 with 1 degree of freedom, p < .001).

Thus, at the end of the first year of postsecondary education students attending a two-year college were slightly more than twice as likely as four-year college students to lower their lifetime educational plans below a bachelor of arts degree. By the end of the second year of postsecondary education two-year college students were more than five times as likely as their four-year college counterparts to plan on obtaining less than a bachelor of arts degree in their lifetime.

Cross-Tabulations (Sample Weighted to National Populations)

Cross-tabulation results with the sample weighted up to the national population were quite similar to those obtained with the sample weighted to the institutional populations. At the end of the first year of college 15.97% of the two-year college students who at entrance to college had initially planned to obtain a bachelor of arts degree reported that they now planned on obtaining less than a bachelor of arts degree in their lifetime. This compared to 4.9% of students attending four-year colleges (χ² = 25.03 with 1 degree of freedom, p < .001). At the end of the second year of college 21.0% of the two-year college students lowered their lifetime educational plans to less than a bachelor of arts degree. This compared to 4.3% of students in four-year institutions (χ² = 58.84, with 1 degree of freedom, p < .001).
TABLE 3.
Logistic Regression Summaries for the Prediction of End-of-First-Year and End-of-Second-Year Educational Plans (Sample Weighted to Institutional Populations)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>End-of-First-Year</th>
<th>End-of-Second-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Logistic Regression Coefficient</td>
<td>Standard Error of Coefficient</td>
</tr>
<tr>
<td>Precollege educational plans</td>
<td>.806</td>
<td>.166</td>
</tr>
<tr>
<td>Precollege academic ability</td>
<td>.003</td>
<td>.064</td>
</tr>
<tr>
<td>Precollege academic motivation</td>
<td>-0.537</td>
<td>.234</td>
</tr>
<tr>
<td>Female</td>
<td>-0.504</td>
<td>.223</td>
</tr>
<tr>
<td>Non-White</td>
<td>-0.344</td>
<td>.244</td>
</tr>
<tr>
<td>Age</td>
<td>-0.025</td>
<td>.017</td>
</tr>
<tr>
<td>Family social origins</td>
<td>-0.018</td>
<td>.037</td>
</tr>
<tr>
<td>Total credit hours completed</td>
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<td>.080</td>
</tr>
<tr>
<td>Hours worked per week</td>
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<td>.036</td>
</tr>
<tr>
<td>On-campus residence</td>
<td>-0.092</td>
<td>.263</td>
</tr>
<tr>
<td>Self-reported grades</td>
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<td>.102</td>
</tr>
<tr>
<td>Social sciences courses taken</td>
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<td>.072</td>
</tr>
<tr>
<td>Mathematics courses taken</td>
<td>-0.062</td>
<td>.089</td>
</tr>
<tr>
<td>Technical/preprofessional</td>
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<td>.128</td>
</tr>
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<td>courses taken</td>
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</tr>
<tr>
<td>Arts and humanities courses</td>
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<td>.065</td>
</tr>
<tr>
<td>taken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural sciences and</td>
<td>-0.019</td>
<td>.089</td>
</tr>
<tr>
<td>engineering courses taken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attended a two-year college</td>
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<td>.265</td>
</tr>
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<td>Constant</td>
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<td></td>
</tr>
<tr>
<td>Model df</td>
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</tr>
<tr>
<td>Model χ²</td>
<td>98.03*</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01.

Logistic Regression Analyses (Sample Weighted to Institutional Populations)

Of course the relationships shown by the cross-tabulations can be substantially inflated because they do not take into account differences among the kinds of students who attend two-year and four-year institutions. The logistic regression procedures we employed permitted us to estimate the relationship between two-year versus four-year college attendance and changes in educational plans while statistically controlling for potential confounding influences. The results of the logistic regression analyses with the sample weighted to the institutional populations are summarized in Table 3. The effect of two-year college attendance on end-of-first-year educational plans became nonsignificant when controlling for gender, ethnicity, academic ability, and other influences in the logistic regression analyses with the sample weighted to the institutional populations. This did not hold, however, for end-of-second-year educational plans. Table 3 further indicates that students were significantly more likely to attend four-year college course work, pursue a bachelor of arts degree by the end of college. This association was much larger for males than for females, as precollege academic ability, and other influences in the logistic regression analyses with the sample weighted to the institutional populations. This did not hold, however, for end-of-second-year educational plans. Table 3 further indicates that students were significantly more likely to attend four-year college coursework taken.

To estimate the magnitude of the two-year (versus four-year) college attendance effect, we employed Delta-p, using a process developed by Pascarella et al. (1994). In the present study, the estimated net effect of two-year college attendance on end-of-second-year educational plans was much larger than for end-of-first-year educational plans. This was true even after controlling for other influences in the logistic regression analyses with the sample weighted to the institutional populations. This did not hold, however, for end-of-second-year educational plans. The estimated net effect of two-year college attendance was much larger than for end-of-first-year educational plans. This was true even after controlling for other influences in the logistic regression analyses with the sample weighted to the institutional populations. This did not hold, however, for end-of-second-year educational plans. The estimated net effect of two-year college attendance was much larger than for end-of-first-year educational plans. This was true even after controlling for other influences in the logistic regression analyses with the sample weighted to the institutional populations.
summarized in Table 3. As Table 3 shows, the effect of two-year versus four-year college attendance on end-of-first-year educational plans became nonsignificant when potential confounding influences were taken into account. This did not hold, however, for the prediction of end-of-second-year educational plans. As Table 3 further indicates, two-year college students were significantly more likely than their four-year college counterparts to lower their lifetime educational plans below a bachelor of arts degree by the end of the second year of college. This association persisted even in the presence of controls for such confounding influences as precollege educational plans, academic ability, and academic motivation, gender, ethnicity, age, social origins, work responsibilities, full- or part-time enrollment, place of residence, college grades, and type of coursework taken.

To estimate the magnitude of the effect of two-year (versus four-year) college attendance on the lowering of educational plans we converted the logistic regression coefficients for two-year college attendance shown in Table 3 to Delta-p, using a procedure outlined by Cabrera (1994). In the prediction of end-of-first-year educational plans the resultant Delta-p for the two-year college attendance was -.023. This means that, net of other influences in the prediction model, two-year college students are only about 2.3% more likely than four-year college students to lower their lifetime educational plans below a bachelor of arts degree after 1 year of college. In the prediction of end-of-second-year educational plans, however, the estimated net effect of two-year college attendance was much larger, Delta-p = -.311. Net of other influences in the model, two-year college students initially planning to obtain at least a bachelor of arts degree were about 31% more likely than similar four-year college students to lower their lifetime educational plans below a bachelor of arts degree by the end of the second year of college.

Logistic Regression Analyses (Sample Weighted to National Populations)

Table 4 shows the results of the logistic regression analyses for the sample weighted up to the national populations. As the Table indicates, the results of these logistic regression analyses closely parallel those yielded when the sample was weighted up to the institutional populations (Table 3). When the influence of potential confounding influences was taken into account, the effect of two-year versus four-year college attendance on end-of-first-year educational plans was nonsignificant. However, by the end of the second year of college two-year college students were significantly more likely than their four-year college counterparts to lower their lifetime educational plan below a bachelor of arts degree. Once again this significant association persisted in the presence of controls for all other variables in the prediction model (shown in Table 4).

Converting the logistic regression coefficients to Delta-p yielded -.034 for the effect of two-year college attendance in the prediction of end-of-first-year educational plans and -.198 for the effect of two-year college attendance in the prediction of end-of-second-year educational plans. Thus, net of other influences in the prediction model, two-year college students were about 3.4% more likely than four-year college students to lower their lifetime educational plans below a bachelor of arts degree after 1 year of college. After 2 years of college two-year college students were 19.8% more likely than students in four-year colleges to lower their lifetime educational plans below a bachelor of arts degree.

Conditional Effects (Sample Weighted to Institutional Populations)

None of the cross-product terms added to the logistic regression model shown in Table 3 (sample weighted up to the institutional populations) significantly improved the prediction of end-of-second-year educational plans. Thus, the negative effect of two-year college attendance on end-of-second-year educational plans appeared to be essentially similar in magnitude for students differing in precollege educational plans and academic ability, gender, ethnicity, age, and family social origins.

Basically the same results were found in the prediction of end-of-first-year educational plans,
TABLE 4.
Logistic Regression Summaries for the Prediction of End-of-First-Year and End-of-Second-Year Educational Plans (Sample Weighted to the National Populations)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>End-of-First-Year</th>
<th></th>
<th></th>
<th>End-of-Second-Year</th>
<th></th>
<th></th>
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<td></td>
<td>Logistic</td>
<td>Standard</td>
<td>Coefficient divided by</td>
<td>Logistic</td>
<td>Standard</td>
<td>Coefficient divided by</td>
</tr>
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<td>Error of</td>
<td>Std. Error</td>
<td>Coefficient</td>
<td>Error of</td>
<td>Std. Error</td>
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<td>.180</td>
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<td>.053</td>
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<td>.216</td>
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<td>.074</td>
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<tr>
<td>Hours worked per week</td>
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<td>.031</td>
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<td>.351</td>
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<td>.051</td>
<td>-1.03</td>
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<td>Social sciences courses</td>
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<td>.027</td>
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</tr>
<tr>
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<td>.061</td>
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<td>.070</td>
<td>.034</td>
<td>2.05</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Natural sciences and</td>
<td>-.091</td>
<td>.069</td>
<td>-1.32</td>
<td>-.078</td>
<td>.032</td>
<td>-2.47</td>
</tr>
<tr>
<td>engineering courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>taken</td>
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<td>-1.144</td>
<td>.251</td>
<td>-4.56*</td>
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<tr>
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<td>1.275</td>
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<td>17</td>
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<tr>
<td>Model $\chi^2$</td>
<td>201.24*</td>
<td></td>
<td></td>
<td>202.50*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .01$.

with one exception. Net of other influences, the cross product of attending a two-year (versus a four-year) college x precollege educational plans had a significant logistic regression coefficient at $p < .01$. This indicated that the modest (and nonsignificant) negative effect of two-year college attendance on end-of-first-year educational plans differed in magnitude for students with different levels of precollege educational plans. To determine the nature of this conditional effect we divided the total sample into two subsamples: (a) students who initially planned to obtain a bachelor of arts degree, and (b) students who initially planned to obtain a master of arts, doctorate, or advanced...
Student Educational Plans

For students who initially planned to obtain a graduate or advanced professional degree (Recall that the sample was limited to those students who on entrance to college planned to obtain at least a bachelor of arts degree.) We then reestimated the logistic regression model predicting end-of-first-year educational plans for the two subsamples and compared the magnitude of the regression coefficients for attendance at a two-year (versus a four-year) college.

For students who initially planned to obtain a graduate or advanced professional degree two-year college attendance actually had a small and positive, but not statistically significant, effect on end-of-first-year educational plans (logistic regression coefficient = .653, p > .20). However, for students who initially planned to obtain only a bachelor of arts degree, two-year college attendance had a substantial, and statistically significant negative effect on end-of-first-year educational plans (logistic regression coefficient = -2.38, p < .01). Thus, the higher one's precollege educational plans the less likely was two-year college attendance to lead to a lowering of educational plans after 1 year of postsecondary education. Conversely, for students with relatively low levels of precollege educational plans (i.e., only a bachelor of arts degree), attendance at a two-year college produced a significant negative influence on end-of-first-year educational plans.

Conditional Effects (Sample Weighted to National Populations)

When the sample was weighted up to the national populations the conditional effects findings closely paralleled those found when the sample was weighted up to the institutional populations. None of the cross-product terms added to the logistic regression model shown in Table 4 significantly improved the prediction of lifetime educational plans at the end of the second year of college. However, in the prediction of lifetime educational plans at the end of the first year of college the same cross product (attending a two-year versus a four-year college x precollege educational plans) was significant at p < .01. For students who initially planned to obtain a graduate or advanced professional degree the effect of attending a two-year college on end-of-first-year educational plans was small and nonsignificant (logistic regression coefficient = -.333, p > .40). However, for students who initially planned to obtain only a bachelor of arts degree two-year college attendance had a substantial, and statistically significant negative effect on end-of-first-year educational plans (logistic regression coefficient = -2.060, p < .01).

Results of Unweighted Sample Analyses

Results of cross-tabulations with the unweighted sample were quite similar to those obtained with the weighted samples. At the end of the first year of college 15.9% of the two-year college students and 5.5% of the four-year college students lowered their lifetime educational plans below a bachelor of arts degree (X2 = 54.61, 1 degree of freedom, p < .001). At the end of the second year of college 20.2% of the two-year college students and 4.26% of the four-year students lowered their lifetime educational plans below a bachelor of arts degree (X2 = 54.61, 1 degree of freedom, p < .002).

The logistic regression results for the unweighted sample were also quite similar to those obtained with the weighted samples. In the prediction of lifetime educational plans at the end of the first year of college the logistic regression coefficient for two-year college attendance was -2.38, t = -1.97, p > .01. In the prediction of educational plans at the end of the second year of college the logistic regression coefficient for two-year college attendance was -1.473, t = -1.473, p > .01. The Delta-p estimates were -.054 and -2.53 for the impact of two-year college attendance on end-of-first-year and end-of-second-year educational plans, respectively.

Finally, the results of the conditional effects analyses with the unweighted sample closely paralleled those using the weighted samples. No significant conditional effects were found in the prediction of lifetime educational plans at the end of the second year of college. However, the two-year/four-year x precollege educational plans cross-product was significant in the prediction of lifetime educational plans after the first year of college. For students who initially planned to obtain a graduate or advanced professional degree...
degree the effect of attending a two-year versus a four-year college was small and nonsignificant (coefficient = .237, \( p > .30 \)). However, for students initially planning to obtain only a bachelor of arts degree the effect of two-year college attendance on end-of-first-year educational plans was negative and statistically significant (coefficient = -2.261, \( p < .01 \)).

CONCLUSIONS

This study sought to test Clark’s (1960, 1980) hypothesis that two-year college attendance actually contributes to lower levels of educational attainment by cooling out or lowering students’ lifetime plans to obtain a bachelor of arts degree. We found at least some correlational, if not causal, support for the cooling-out hypothesis after 2 years of postsecondary education. Our estimates based on two different weightings of the study sample suggest that two-year college students who initially planned to obtain a bachelor of arts degree in their lifetime were between 20% and 31% more likely than similar four-year college students to lower their lifetime educational plans below a bachelor of arts degree by the end of the second year of college. This association persisted in the presence of controls for precollapse educational plans, academic ability and academic motivation, gender, ethnicity, age, family social origins, credit hours taken, work responsibilities, grades, and the kinds of courses taken. The corresponding association during the first year of college was in the same direction, though much smaller in magnitude and not statistically significant. Overall the negative association of two-year college attendance with educational plans tended to be general rather than conditional. That is, it had essentially the same magnitude for students with different precollapse characteristics. The only exception to this was in the prediction of end-of-first-year educational plans, where the association with two-year college attendance depended on level of precollapse educational plans. For students who initially planned to obtain a master of arts, doctorate, or advanced professional degree, attending a community college did not have a significant negative association with end-of-first-year educational plans. However, community college attendance did have a significant negative association with end-of-first-year educational plans for those students who initially planned to obtain only a bachelor of arts degree in their lifetime. Although the interpretative burden was placed on estimates obtained from samples weighted up to the institutional populations and the national populations, essentially the same estimates of two-year college effects were obtained with parallel analyses of the unweighted sample.

Much of the criticism of two-year, community colleges probably has its basis in fact that students who attend them are significantly less likely to compete a bachelor of arts degree than are students at four-year colleges and universities. The results of this investigation suggest that the lower likelihood of degree completion may not be solely a function of the structural obstacles placed in the path of community college students as they seek to transfer to a four-year institution (i.e., securing acceptance, obtaining financial aid, transferring credits). Rather, our findings suggest at least the possibility that attendance at a community college may actually contribute to a lowering of precollapse plans to complete a bachelor of arts degree. Of course there is a need for caution in making strict causal inferences from the findings of the study. First, the findings were based on correlational data, and second, the data do not allow us to identify the specific environmental factors in two-year colleges that might cause students to lower their initial educational plans.

In his trenchant analysis of the societal role of the two-year institution Dougherty (1994) employs the term contradictory college. Considered within the context of the body of research on the impact of two-year versus four-year institutions our findings would tend to support his description. On the one hand students initially aspiring to a bachelor of arts degree are less likely to obtain it if they start at a community college, in part, perhaps, because community college attendance is linked to a lowering of educational plans. On the other hand recent evidence (reviewed earlier in this paper) indicates that the cognitive or intellectual impact of community colleges may not be related to teaching received or the programs at those institutions. Researchers may have to look to the social-psychological function of community colleges to understand the social-psychological function not so much to cool aspirations or plans, but to clarify aspirations or plans, undeveloped, uncertain, unrealistic. Those who do not aspire to an arts degree is not for the simple reason that they have been cooled out of college. However, from a social-psychological perspective it could be considered such that they have gotten the infor- mation necessary to make informed decisions. Unfortunately, the contested by this investigation a definitive distinction between explanations for the findings of the study.

POLICY IMPLICATIONS

The findings of the current study need for community college support or mentoring primarily to complete...
community colleges may be the equal of many four-year institutions. This suggests that any cooling out of educational plans by community colleges may not be related to the quality of the teaching received or the rigor of the academic programs at those institutions. Rather, researchers may have to look to other aspects of the social-psychological environment of community colleges to understand how they may function to change students’ educational plans; clearly this is an important direction for additional research.

Of course, a very real competing explanation for our results that must be taken quite seriously is that a substantial number of students who initially enter two-year colleges for the ostensible purpose of obtaining a bachelor of arts degree have unclear or undeveloped educational plans to begin with. Manski (1989) and Grubb (1996) have both suggested that many students in community colleges are experimenters who may indicate that they want a bachelor of arts degree but are actually somewhat unsure of what they want to do, and they have no way of finding out except by experimenting with postsecondary education in low-cost institutions. For these students community college attendance may function not so much to cool out genuinely held aspirations or plans, but rather to assist them in clarifying aspirations or plans that may be undeveloped, unclear, or perhaps even unrealistic. Those who decide that a bachelor of arts degree is not for them may look as though they have been cooled out by the community college. However, from another perspective “they could be considered successes in the sense that they have gotten the information necessary to make informed decisions” (Grubb, 1996, p. 62). Unfortunately, the cooling-out hypothesis as tested by this investigation cannot make a definitive distinction between such alternative explanations for the findings.

POLICY IMPLICATIONS

The findings of the current study underscore the need for community colleges to provide sufficient support or mentoring to students who enroll primarily to complete their first 2 years of postsecondary education and then transfer to a four-year institution to finish their bachelor of arts degree. Simply providing offices and services, such as a transfer center, may not be sufficient to encourage students to make effective use of them. The disproportionately large numbers of minority and first-generation college students enrolling in community colleges may warrant a more proactive system of student affairs programs and support services that actively encourages their aspirations and plans. For example, evidence reported by Nora and Cabrera (Cabrera & Nora, 1992, 1993; Nora, 1987; Nora & Cabrera, 1994, 1996) indicates that active support and encouragement by significant others, including faculty and professional staff, are particularly crucial to the persistence of minority and nonminority students in two-year and commuter institutions. Similarly, Rendon (1994) found that active validation of non-traditional student worth and competence in the classroom has an important impact, not only on how those students come to perceive themselves socially and academically, but also on their subsequent aspirations and plans.

Second, from a more general environmental perspective, community college administrators and student affairs professionals may have to focus particular effort on eliminating the aura of second class status often attached to community colleges and their students in American society (e.g., Brint & Karabel, 1989; Dougherty, 1994; Zwerling, 1976). This second-class or second-class mind-set may never quite be overcome, either by the students who enroll, or by the professional counseling staff who work at community colleges. Clearly, it is important to help ease students’ transition from secondary to postsecondary education, and to assist them in developing a realistic view of their academic skills and resources in relationship to what will be required to complete a bachelor of arts degree. At the same time, however, community college advisors and counselors must take care not to turn the cooling-out hypothesis into a self-filling prophecy through behaviors and attitudes that needlessly undermine a student’s confidence and discourage him or her from pursuing educational goals that are potentially achievable.
LIMITATIONS
This investigation has several major limitations that should be kept in mind when interpreting the findings. First, although the sample consisted of a broad range of institutions from around the country, the fact that the analyses were limited to 18 four-year and only 5 two-year institutions means that we cannot necessarily generalize the results to all two-year and four-year institutions. Similarly, the sample from the two-year institutions consisted of only 119 students followed over a 2-year period. This is a rather slender thread on which to hang definitive test of the cooling-out hypothesis. For this reason the findings of this study should be regarded as constituting only a preliminary test of the cooling-out hypothesis.

Second, although attempts were made in the initial sampling design, and subsequent sample weighting to make the sample as representative as possible at each institution, the time commitment and work required of each student participant undoubtedly led to some self-selection. We cannot be sure that those who were willing to participate in the study responded in the same way as would those who were invited but declined to participate in the study. Weighed against this, however, is the fact that we found no significant conditional effects involving such factors as precollege academic ability, age, gender, ethnicity, or family social origins. Thus, even if the sample had some bias on these factors, it did not appear to have an appreciable influence on the study findings.

Third, we could not track individuals who left their institution during the study. Consequently, some students in the two-year college sample who dropped out of the study may have actually transferred to a four-year college to pursue their bachelor of arts degree. Although this is clearly a possibility, at least some evidence suggests that students who dropped out of the study had characteristics that made them less likely to have been successful transfer students than those who remained in the study for years. Compared to those two-year college students who persisted in the study for two years those who dropped out of the study tended to have lower average precollege educational plans, lower average precollege academic ability, lower average self-reported grades during college, and were enrolled for a lower average number of credit hours.

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REFERENCES
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