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Part II

Reorienting the HEA Reauthorization to Reflect What Research-Based Knowledge Says About What Works

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Executive Summary

Background

This study is a more technical companion to another study (Stampen and Hansen 2004a) that describes and summarizes the results of a survey of higher education policy analysts and researchers. With the approaching 2004 reauthorization of the federal Higher Education Act (HEA), survey participants were asked to give their priority rankings to eight broad categories of options for possible changes in the educational process (called Broad Options) and 86 smaller possible changes (called Specific Options). In assigning priorities to these options, respondents were asked to consider each option's effectiveness in improving students' access and subsequent success in postsecondary education.

In this particular study, rankings by higher education analysts of these 86 Specific Options and the results of empirical research in education are examined for insights into which actions can be taken to actually improve access and college student success and which actions are likely to be most important. The study draws on the Pathways model and the *empirically-based* estimates generated by that model. The estimates show which factors most affect a student's likelihood of applying to college and later graduating from college. The Pathways model emerged out of a synthesis of research on the multitude of factors affecting student passage through and beyond certain milestones en route to a college degree.

The Pathways model is estimated using a logistic regression. The data come from U. S. Department of Education longitudinal surveys that track individual students and their experiences as they pass through high school and later through college. What emerges is a set of coefficients that indicate how changes in an array of factors identified by prior research alter the probability of reaching each benchmark along the path to a college degree.

Once the high priority options from the current survey are placed within the Pathways model framework, comparisons can be made with the empirical estimates of changes in the probability of applying for and of graduating from college that would result from implementing these options. It should be pointed out that the results are illustrative rather than definitive because of the preliminary nature of this analysis.

Findings

Most of the 86 Specific Options included in the survey fall can be matched to two of the eleven Pathways categories of factors affecting the likelihood of applying to college, the **College Decision**. Among them, 23 fit into the category of Academic Resources and 27 in the category of Financial Aid Mix, with the remainder are scattered among the other categories.

Among the 19 high priority Specific Options, which are of particular interest for this study, the dominance of these two categories continues; seven of these Options fall under Academic Resources and six under Financial Aid Mix. Three high priority options match the category, Awareness of College Characteristics, Admission Standards, and Costs; two of the high priority options match the category, Family Encouragement/Involvement. Surprisingly, none of the high priority options match the four factors listed under the **College Experience** category. This is important because in the Pathways model the factors listed in the **College Experience** category directly affect persistence in college and eventual graduation from college. Finally, six of the high priority Options affect both the **College Decision** and **College Experience**.

Just as there is no one-to-one match between the high priority options and the Pathways model categories and factors, there is no neat one-to-one relationship between the high priority options and the Pathways model estimates. For example, the strongest variables influencing **College Experience** include the effects of College GPA, Completing one or more math or science courses, and Being continuously enrolled; all have strong effects on the likelihood of graduating, which range from 21-42 percent. Big negative factors that reduce the probability of graduating from college include the Dropping of college courses and Having children. More moderate effects, ranging from 4-12 percent, show up for include Receiving financial aid loans and grants, being Highly prepared for college, the Quality of instruction, and Out-of-classroom experiences. Finally, such factors as Institutional prestige and Counseling, and Working on campus have only slight positive effects, ranging from 0-1 percent.

Finding a good match between the high priority options and the Pathways variables is not easy. Though many of the Pathways variables show strong effects, there is no tight fit. In other words, for many of the high priority options, it remains unclear whether implementing the high priority options would produce substantial gains in either applying to and graduating from college.

What we conclude is that the high priority options being discussed for the 2004 reauthorization do not closely enough link to research supporting the Pathways model to confidently predictions that would substantially improve votes which students succeed in, and graduate from college. This means that incorporating some or even many of these high priority options into the reauthorization is unlikely to produce the kinds of results that might be expected of an effective reauthorization of HEA. One reason is that some of these options are not appropriate for higher education legislation because they apply to the earlier years of school and even the pre-school years. Another is that legislation cannot do for individual students and their parents what they must do for themselves, as reflected by the importance of both parental expectations and student aspirations.

The paper concludes with three brief recommendations for the reauthorization process: (1) avoid adopting wasteful and costly policies that will do little to eliminate barriers to access and success, (2) better coordinate and align with research researching the improvement efforts by participants. (3) focus on improving student learning before they

reach college age by giving special attention to the barriers that prevent their learning, particularly for at-risk students, and (4) draw on the best available research findings and build them into the reauthorization legislation.

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Reorienting the HEA Reauthorization to Reflect What Research-Based Knowledge Says About What Works

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I. Introduction

The usual proposed solutions intended to substantially improve access, persistence, and academic success of students in postsecondary education, such as lower tuition and increased student financial aid, will not by themselves increase the enrollment and graduation rates of students from all kinds of backgrounds. In this paper we seek to identify proposals that have a high probability of producing substantial improvements in students' postsecondary education access and student success. Specifically, we employ a new type of education research, known as the "Pathways" approach, to analyze the responses of well-regarded higher education researchers and policy analysts to a recent compilation of issues under discussion for the 2004 reauthorization of the federal Higher Education Act (HEA) (Stampen and Hansen, 2004a). This approach reveals clearly that student access and academic success depend on many factors present throughout a student's career, from the pre-kindergarten years through college graduation. This new research is particularly valuable not only because it synthesizes a large body of existing research, but also because it presents within a single overarching framework the likely impact of the many variables that influence student progress along the road to a college degree.

We use the Pathways approach and its findings to examine the possible effects of the large number of the policy proposals under discussion in early 2003. This research-based approach to assessing the impact of policy proposals contrasts sharply with the intuitive approach used in past HEA reauthorizations. Historically, proposals were chosen more for their political feasibility than for their potential effectiveness. We hope the results of this study will guide the various interest groups, as well as officials in the federal executive branch and eventually the Congress, as they formulate and debate the reauthorization legislation.

We open by describing the Pathways model and how it can be used to help produce a more targeted and effective reauthorization bill. This is followed by our effort to place within the Pathways framework the high priority rankings of the many proposals now under consideration for the 2004 reauthorization; these priority rankings were obtained through a Spring 2003 survey of higher education policy analysts and researchers. Next, we describe how to estimate the degree to which the Pathways factors contribute to access and success. We then match the estimates from the Pathways model to the field-based priority rankings of the options being discussed for reauthorization. Finally, we summarize the paper's key findings and limitations, and their possible implications. We close with several brief

recommendations, one of which calls for the development of a more comprehensive Pathways model that can help guide those in the executive and legislative branches who seek to improve student access and success in postsecondary education.

II. Pathways Approach to Reauthorization

If the 2004 reauthorization is going to be as constrained as the recent Wolanin (2003) analysis suggests, the process needs revitalization.[1] New vigor could come from a redirection of attention away from a narrow focus on student financial aid to a wider consideration of those factors that actually determine student access and academic success. How might this shift in attention occur? Instead of allowing the reauthorization process to be an opportunity for the current Administration and its allies in the Congress or for current coalitions of interest groups to promote their particular pet agendas, those charged with framing the issues should build upon recent behavioral research that examines what actually makes a difference in student access and academic success. This data-based approach can provide the information needed to assess which of the proposals under consideration have the greatest statistical probability of succeeding, distinguishing them from those proposals that might serve as ideological and political symbols but not prove to be effective.

The behavioral research we refer to is the series of Pathways studies conducted by UW-Madison Professor Alberto Cabrera and various associates and contemporaries, including Adelman (1998, 1999); Bers and Smith (1991); Cabrera, Colbeck and Tarenzini (In press); Cabrera and La Nasa (2000); Cabrera, La Nasa, and Burkum (2002); Cabrera and Nora (1994); Cabrera, Nora, and Castaneda (1992); Cabrera, Terenzini, and Bernal (1999); Dougherty (1992); Jones and Lee (1992); Kinnick and Kempner(1988); Kraemer (1995); Lee and Frank (1990); Merisotis and Phipps (2000); Nora and Rendon (1990); Olivas (1985); Perna (2000) Terenzini, Cabrera, and Bernal (2001) and Voorhees (1987).[2]

Underlying the Pathways approach is the simple question: "What are the chances for a high school sophomore to eventually secure a bachelor's degree within 10 years?" What makes the Pathways research so important and compelling is that it identifies factors affecting students' ability to prepare for and succeed in college, and after completing college, to become self-reliant and productive citizens. In other words, the Pathways framework predicts what is required to survive and thrive all the way through secondary school and college and beyond. If the reauthorization process can incorporate the Pathways results, the likelihood will be increased of adopting high-priority options that will achieve substantial gains in college access and academic success. In other words, the leveraging possibilities of a research-based approach to reauthorization are likely to be substantially greater than those resulting from the usual political process.

The Pathways model has **three major components** or stages, as shown in Figure 1. Its ultimate focus is on those factors that determine **College Outcomes**, which include the Competencies acquired, the Satisfaction and

[1] See Wolanin (2003) for his analysis of the prospects for reauthorization.
[2] The Pathways to College Network in a new report (2004) draws on this and other research in developing a list of more than 100 recommendations designed to make college more attainable for all.

commitment gained, Persistence/transfer to continue through college, and Degree completion, all of which contribute to post-college success. Students' achievement of these outcomes, however, depends on a series of decisions and experiences, some of them occurring long before they enter college.[3]

In the first stage, **College Decision**, the Pathways model identifies factors that affect the decisions of students to prepare themselves for admission, to apply to, and to attend college. This stage includes five elements: (1) Family Encouragement and Involvement which helps steer students toward academic success; (2) Preparation for College, which includes courses and educational experiences that equip students to become admissible and to succeed in college; (3) K-16 Communication and Engagement, which refer to a school and community environment that promotes learning; (4) Aspirations and Plans, which specifies factors that affect the intensity of students' interest in attending college; and (5) students' Awareness, which examines what colleges expect students to know and be able to do once they enroll, along with knowing how to pay the costs of college. The final element (6) Financial Aid Mix considers the likelihood and the amount of financial aid received.

Students benefitting from the following conditions are obviously more likely to attend and succeed in college than young people who lack some or all of these important characteristics: students who are encouraged to do well in school by people close to them, who take courses and accumulate experiences that predict success in college, who attend elementary and secondary schools in communities that support education by providing high quality teachers and other learning support resources, who generally have some idea what they want to do in life and how college can help, and who understand what they must do to stay on reasonably good terms with others once they enroll in college.

Figure 1: The Pathways model: College Persistence as a Longitudinal Process

<table>
<tr><th>College Decision</th><th>College Experience</th><th colspan="2">College Outcomes</th></tr>
<tr><td>Family Encouragement & Involvement</td><td>Academic Integration</td><td>Competencies</td><td>Graduate School</td></tr>
<tr><td>Preparation for college</td><td>Social Integration</td><td>Satisfaction & Commitment</td><td>Employment & Income</td></tr>
<tr><td>K-16 communication & engagement</td><td>Facilities and Services</td><td>Persistence Transfer</td><td>Job Performance</td></tr>
<tr><td>Aspirations & Plans</td><td rowspan="2">Climate and Diversity</td><td rowspan="3">Degree Completion</td><td rowspan="2">Job Satisfaction</td></tr>
<tr><td>Awareness of College Characteristics, Admission Standards, & Costs</td></tr>
<tr><td colspan="2">College Decision and College Experience</td><td>Financial Aid Mix</td></tr>
<tr><td colspan="2">Financial Aid Mix</td><td colspan="2">Loan Repayment</td></tr>
</table>

Source: Adapted from Alberto Cabrera presentation: "Paving the Way to Concrete: What Matters," at UW-Madison WISCAPE Conference, Federal Postsecondary Education Policies: Implications for Institutions and Students, October 8-9, 2002.

The second stage, **College Experience**, focuses on factors that predict college students' success after they have received sufficient family and academic support to give them a good chance to succeed in college. These elements include (1) Academic Integration, which is the extent to which individual students identify with and enjoy the

[3] To make the Pathways research even more useful, it should extend back to embrace early childhood development and the pre-school years, as well as elementary and middle schools which impart literacy, arithmetic and other academic subjects that are essential to success in both high school and college.

challenges of academic life; (2) Social Integration, which concerns whether students succeed in forming friendships and associations outside-of-class that enable them to feel at home in a college community; and (3) Facilities and Services that create an environment conducive to student success. The factor of (4) Climate and Diversity deals with barriers unique to students from uncommon backgrounds, such as historically under-represented racial and ethnic groups. Finally, the (5) Financial Aid Mix category emphasizes the importance of obtaining sufficient financial resources to pay for the many expenses of college.

The third stage, **College Outcomes**, previously mentioned, identifies four additional predictors that encompass the results of college: (1) Competencies; (2) Satisfaction and Commitment; (3) Persistence; and (4) Degree Completion. These outcomes become the basis for longer terms effects, which the Pathways model lists as: (1) Graduate School Enrollment; (2) Employment and Income; (3) Job Performance, (4) Job Satisfaction, and (5) Loan Repayment.

Those factors that support decisions or encourage students' decision to attend college early on continue to be important even after they enroll. An obvious example is the continued importance of personal encouragement from parents and others. Other factors with continuing influence include academic resources, such as faculty advising; student financial aid; student health services; two-year colleges that provide remedial instruction and counseling services; requirements by colleges that students acquire a mastery of basic academic skills (writing, speaking, mathematical reasoning) prior to admission so as to lessen the need for remedial programs. Students' clear goals and aspirations, as well as their ability to plan for the future remain important, as does students' awareness of the requirements for graduation and for post-college success.

The Pathways model appears to confirm the findings of many studies of student behavior that lead to and through college. In effect, this model constructs a robust conceptual bridge between the narrow focus of traditional academic research and the new comprehensive data-based research. This bridge can help illuminate the simultaneous quantitative significance of a host of variables. Since the mid-1980s, there has been a steady increase of both descriptive and behavioral studies that are based on the growing number of large, longitudinal data-bases developed by the U.S. Department of Education, see Adelman (1998, 1999); Berkner and Chavez (1997); Carroll (1989); Choy and Premo (1996); Gladieux and Swail, (2000); and Horn and Chen (1998). These surveys have added an important new dimension to both descriptive and behavioral research.

We propose that rather than focusing on whether political and economic conditions are favorable to significant changes in reauthorization legislation, or on the interplay of the actors both inside and outside the legislative branch, those closest to the process should shift their focus to data-supported proposals that can actually improve student access and academic success. Too often the solutions adopted under the current system lack a sound basis in research. They are costly and fail to produce the intended effects. With the shift of attention proposed here, participants in the legislative and policy-making arena may be able to work together to incorporate changes that can actually improve student access and academic success. The key is recent behavioral research that identifies the kinds of options, and,

more importantly, the combinations of options that are likely to have the greatest effect. Now, the challenge is how best to incorporate these research findings into the reauthorization process.

III. Aligning the Priority Options in the Pathways Framework

Table 1 establishes the links between the Specific Options identified by survey respondents and the key elements of the Pathways model. The three columns record the priority rankings that policy analysts and higher education researchers gave to 86 separate policy options under discussion in 2003 (Stampen and Hansen, 2004a). The options are divided into three categories: first, the high priority options ranked "Highest" or "High" by 72 percent of the respondents; second, the medium priority options with rankings ranging from 50-71 percent, and finally, the remaining low priority options.

The survey results are revealing in two ways. One is the concentration of high priority options that correspond to the two **College Decision** categories, Preparation for College, and Financial Aid Mix; as well as the high percentage rankings given to the Specific Options within these categories. The other revelation is the complete absence of any high priority options in any of the **College Experience** categories: Academic Integration, Social Integration, Facilities/Services, and Diversity/Climate. Nor are any high priority options found in the Aspirations and Plans category. In short, none of the options that the survey respondents rated highly acknowledged the importance of the **College Experience** categories that the Pathways research has found to be so important to graduating from college.[4]

IV. The Pathways Model Estimates.

With the high priority Specific Options now placed within the Pathways framework, the next question is this: based on the Pathways estimates, to what extent are the high priority Specific Options likely to improve student access and success in college? We explain first the methodology used to estimate the influence of the Pathways factors in increasing the probability a student will apply for college if the corresponding high priority Specific Options were implemented. From this comparison, we can assess the probable effectiveness of the high-ranked Specific Options, based on the research results about the Pathways model factors that resemble or encompass those Specific Options.

The Model

In the Pathways studies, the progress of individual students can be followed from the 8th grade through college graduation with the help of longitudinal surveys conducted by the U.S. Department of Education. Using a logistic regression technique, the Pathways authors estimate the contribution of each of an array of factors to the success of students and their progress through four years of high school and then through completion of their college degree. What emerges is a set of coefficients that indicates how changes in each individual factor alter the probability of a student reaching various benchmarks along the path toward a college degree. These benchmarks include securing

[4] The absence of variables representing **College Experience** may reflect a widely shared view among participants in the policy making process that the kinds of variables that researchers identify as important once a student is enrolled in college are unimportant compared to being academically well prepared and having enough money to attend college. For example, in Washington D.C. policy discussions the term "sociological fufu" has been used to refer to the and measure of academic and social integration.

Table 1: Classification of Specific Options Based on "High", "Moderate," and "Low" Priority Interval Rankings, by Pathways model Categories

Categories	Priority Interval Rankings	
	High Range = 72%+	
College Decision		
Family Encouragement & Involvement	79% Educate parents about different strategies for paying for college (VII.d) 78% Help parents of at-risk K-8 student influence their children to take advantage of opportunities designed to help them succeed academically (III.e)	
Preparation for college	83% Raise teacher salaries to attract and retain high quality teachers (II.e) 82% Encourage low-income students to take entrance exams and apply for college (IV.a) 77% Prepare teachers in urban settings to work with parents and community groups to improve learning (II.f) 76% Reward teachers who receive training in high-need academic subjects (II.c) 74% Increase availability of pre-kindergarten programs so students arrive at school ready to learn (III.g) 73% Reward faculty for effective teaching (VI.a) 72% Train teachers and staff to evaluate student learning progress (II.d)	
K-16 communication & engagement	79% Provide supplemental support to after-school and summer programs for at-risk K-12 students (III.b)	
Aspirations & Plans		
Awareness of College Characteristics, Admission Standards, & Costs	88% Inform high school students about different ways to finance college attendance (VII.a) 87% Inform parents of academic subjects needed by students to succeed in 4-year colleges (IV.d) 81% Inform high school students about the range of total college costs (e.g., tuition, room and board, transportation) (VII.b)	
College Experience		
Academic Integration		
Social Integration		
Facilities/Services		
Climate/Divesity		
College Decision and College Experience		
Financial Aid Mix	80% Increase size of Pell grants for low-income students who are admitted to college (VIII.e) 79% Increase funding levels for Pell grants (VIII.a) 77% Help low-income students reduce total debt burdens (XI.f) 73% Simplify and clarify eligibility for need-based aid (IX.h) 72% Increase size of need-based grants provided by the federal government (IX.i) 72% Improve coordination among need-based aid programs, tuition costs (XI.g)	
Total	**19**	

Notes: Of the 86 Specific Options in the survey, 80 fit within the Pathways model. The six that do not are all in the Low Range. If they were to be categorized, they would fall into a category called Standards. These six Specific Options are:

48% Adopt state learning standards for elementary, middle and high school grade levels (I.c)
43% Adopt state testing of learning outcomes for elementary, middle, and high school grade levels (I.d)
35% Adopt national learning standards for elementary, middle and high school grade levels (I.a)
27% Adopt national testing of learning outcomes for elementary, middle, and high school grade levels (I.b)
14% Adopt national learning standards for postsecondary education (I.e)
14% Adopt national testing of learning outcomes of postsecondary education (I.f)

	Medium Range = 50-71%	**Low Range = Under 50%**
	64% Develop effective ways of involving parents in student learning (IV.f) 63% Increase incentives for students/families to save for college (IRA, etc.) (VII.c) 59% Provide promising middle ability students with sufficient aid to attend college (IV.c)	44% Guarantee college student financial aid to promising elementary students (IV.b) 11% Expand access to private K-12 schools through a voucher system (IS.d)
	68% Provide more training for college faculty on how to teach (VI.e) 63% Strengthen GEAR UP and TRIO to equip at-risk students to succeed in college (IX.e) 62% Provide more training for college faculty and staff on how to evaluate student learning (VI.b) 60% Expand availability of advanced placement programs to all high schools (IV.e) 58% Require more 8-12 grade students to enroll in traditional college preparation courses (III.c) 51% Increase funding for TRIO program (IX.g) 50% Assess learning of individual college students as a criterion for graduation (V.b) 49% Improve K-12 vocational education for those not planning to attend 4-year college (III.f)	48% Increase funding for GEAR-UP program (IX.f) 45% Tailor academic programs and support services to meet individual student needs (VI.e) 43% Use new technologies to enhance instruction and learning (VI.d) 35% Offer financial incentives for national certification of teachers (II.a) 30% Offer financial incentives for state certification of teachers (II.b) 24% Increase academic requirements for admission to 4-year colleges (IV.g) 24% Phase out remedial courses at four year colleges and universities (V.b) 19% Enable students to graduate from high school with both diplomas and 2-year technical college degrees (V.a)
	70% Mobilize community resources to provide coaching and extra instruction for K-12 student at risk of failing (III.a) 67% Increase curricular alignment between K-12 and postsecondary education (III.d) 65% Conduct controlled experiments to discover effective ways to improve student learning (I.h) 60% Expand state data bases to support comparisons of student performance across schools (I.j) 56% Educate the public about how schools and communities can work together to improve teaching and learning (I.g) 50% Expand federal data bases to support state comparisons of student performance across states and schools (I.k)	
	56% Recognize/reward schools showing improvement in student outcomes (I.i)	16% Pay public college tuition costs for all students maintaining a B average in high school (VII.e)
	54% Promote social and academic relationships among students from diverse backgrounds (V.e) 52% Encourage students to study harder in college (VII.f)	49% Develop programs to help Pell grant recipients improve academic performance (VII.g) 47% Target work-study funds toward low-income students (X.g) 47% Raise faculty expectations of acceptable academic performance among students (V.d) 42% Expand first year academic skills seminars on postsecondary campuses (V.c) 40% Stop grade inflation in schools and colleges (V.g) 39% Provide additional student services to returning and older students (VI.f) 34% Link work-study funding to service learning programs (X.f)
		40% Employ race/ethnicity as a criterion for determining students admissibility to college (VI.g) 33% Expand awareness of ethnic and/or multicultural needs through required college courses (V.f)
	70% Increase the size of need-based grants provided by state governments (IX.j) 61% Make Pell grants an entitlement (VIII.b) 60% Increase funding for colleges and universities to provide need-based grants (IX.k) 59% Simplify methods of calculating available financial aid (IX.c) 58% Reduce students' dependence on loans to finance college (XI.b) 57% Expand federal funding for work-study programs (X.e) 56% Provide extra federal support for institutions serving neediest students (X.b) 55% Increase federal incentives for states to expand grant programs (LEAP/former SSIG) (X.d) 50% Create "rainy day" funds to limit tuition increases during hard economic times (X.c)	46% Encourage states to help students repay student loans (XI.d) 40% Coordinate funding for student aid with tuition tax credits (IX.a) 38% Limit interest subsidies to student borrowers who can demonstrate financial need (XI.i) 36% Raise annual borrowing limits in federal student loan programs (XI.a) 35% Increase (front load) Pell grants for first two years of college (VIII.c) 31% Extend time allowed to repay student loans (XI.c) 27% Increase the size of Pell grants by limiting eligibility to four years (VIII.d) 16% Provide lines of credit for all students to cover college costs (XI.e) 13% Charge higher tuition for students taking excessive number of course credits (X.a) 12% Use academic merit to determine student aid eligibility (IX.b) 12 % Convert Pell grants to loans for students who fail to obtain academic degrees (VIII.f) 6% Limit undergraduate loan eligibility to four years (XI.h)
	29	**32**

at least the minimal qualifications for college, graduating from high school, and applying to college, as well as transferring from a two-year to a four-year college, and graduating from college. Thus, the Pathways study is designed to help policymakers find out what works, that is, what factors contribute most to students reaching the various benchmarks en route to the college degree.[5]

The data used to produce the Pathways estimates come from two extensive longitudinal studies. The first study follows the educational experiences of a large sample of eighth-grade students as they move through their high school experience, culminating with their graduation and application for college. In the survey, students were asked to respond to a series of questions designed to reveal the factors contributing to their success, or lack of it, in actually applying for college; this information comes from the NELS:88 survey. The second study follows the educational experiences of a different group, a large sample of high school sophomores as they move through high school, into college, and on through graduation from college. These students were asked a similar but not identical set of questions designed to reveal more about what accounts for their success in graduating from college; this information comes from the 1980 High School Sophomore Cohort. In both studies, some of the Pathways variables represent a composite of the information collected through the survey. The two surveys used to generate the estimates were conducted at different times; hence, the questions in the two surveys are not identical. Because the Pathways results are so voluminous, we cannot present them here in full detail. We focus instead upon two critical benchmarks, Applying for College, and Graduating from College.[6]

To estimate the probability of a student applying for college, the individual student's data had to be combined into a large data base to facilitate the statistical estimation. A logistic regression model is used in both cases to estimate changes in the probability of applying to or graduating from college. The reason for using this estimating approach is that the dependent variables of interest are dichotomous–individual students either apply or do not apply, or either graduate or do not graduate. The results produced by the logistic model yield a series of coefficients expressed in logarithmic form showing the effect of changes in or differences in each of the factors on the probabilities of applying for college, or of graduating from college, holding all other factors constant. Interpreting these coefficients is made easier by converting them to adjusted probabilities. Thus, for a continuous variable such as grade point average (GPA), the adjusted coefficient indicates that for every unit increase in GPA, from say a 2.0 to 3.0, or from a C to a B average, there is an increase in the probability of applying for college. In the case of dichotomous variables, the coefficient for that factor means that the designated group, such as females, is more likely than males to apply for college. It is important to remember that the resulting estimates reflect the impact of a change in or difference in each independent variable on the probability of applying for college, based on the statistical assumption that all the other factors remain constant.

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[5] While the resulting coefficients reveal the strength of the associations between the benchmarks and the factors included in the analysis, they are not intended to imply causation.

[6] Readers are referred to two of the Pathways studies (Cabrera & LaNasa, 2000; and Cabrera, LaNasa, & Burkum, 2001) for detailed descriptions of these studies, including the methodology, results, and implications.

Interpreting the Estimates

Table 2 illustrates the results of a group of factors that change the probabilities of students applying for college.[7] The 0 percent figure in the first line under Pathways Factors indicates there was no difference in the probability of applying for college between students whose parents expected them to complete "some college" and students whose parents who did not expect them to complete some college. By contrast, students were 26 percent more likely to apply if their parents expected them to earn a bachelors degree as compared to students whose parents had no expectation of them attending college. Those students whose parents expected them to pursue an advanced degree were 22 percent more likely to apply to college than students whose parents had no expectation for them to attend college.

A similar interpretation can be given to the next three factors concerning student aspirations. Students who aspired to completing "some college" were no more likely to apply to a college than those who had no aspirations for college. By contrast, students who aspired specifically to earning a bachelors degree or to pursuing an advanced degree were, respectively, 28 percent and 34 percent more likely to apply for college.

The remaining factors involve either/or possibilities. For example, students who report having discussed with their parents some aspect of their college preparation are 7 percent more likely to apply for college than students who reported no such discussions. Similar interpretations can be given to each of the other factors. Not surprisingly, the presence of risk factors (for example, a composite variable based on the student coming from a single parent family, having siblings who had dropped out of high school, having changed school two or more time between 1st and 8th grades, and a low GPA from 6th to 8th grade, and having repeated an earlier grade) lowers by 7 percent the probability of applying for college.

The Background Variables are also of interest. With all other factors held constant, females are no more likely than males to apply for college. Students who come from the second lowest SES (socio-economic status) group are no more likely than those from the lowest SES group to apply for college. However, students from the upper middle SES are 15 percent more likely to apply while those from the upper SES are 26 percent more likely to apply for college

Table 2: Illustrative Data from Pathways Study Showing Associations Between Each Factor and Percentage Changes in teh Probability of Applying for College Among 12th Graders

Factor	All
Pathways Factors	
Parent expected some college	0%
Parent expected bachelor's	26%
Parent expected advanced degree	22%
Aspired for some college	0%
Aspired for Bachelor's	28%
Aspired for adanced degree	34%
Parental Involvement	7%
College-qualifications	14%
Information on Financial Aid	5%
Help in college application	11%
Help in financial aid procedures	0%
Help in college essays	8%
Risk factors	-7%
Background Factors	
Female	0%
Second lowest SES	0%
Upper Middle SES	15%
Upper SES	26%
Hispanic	0%
African American	13%
Asian American	13%

Source: Adapted from Table 11 of Cabrera and LaNasa (2001), "On the Path to College: Three Critical Tasks Facing America's Disadvantaged," Center for the Study of Higher Education, Pennsylvania State University, May 15.

[7] To simplify the presentation, levels of significance have been eliminated though most all of the reported figures are significant at the 10 percent level and most of them at the 1 percent level.

than students from the lowest SES. With respect to race/ethnicity, Hispanics are no more likely than whites to apply for college, whereas African Americans and Asian Americans are 13 percent more likely to do so.

In all cases, the adjusted coefficients are interpreted to signify percentage changes in the probabilities of students applying for college that are associated with changes or differences in particular factors when the influence of all other factors remains constant. Readers are cautioned that the coefficients are not additive; that is, two or more of the coefficients cannot be added together to reflect the effect of several simultaneous changes. Nonetheless, the coefficients do highlight the relative effect of changes or differences in the various individual factors.

V. Linking the Pathways Estimates to High Priority Options

The next step is to link the Pathways factors and their accompanying probability estimates to the high priority Specific Options that were embedded in the Pathways framework in Table 1. The results are presented in Table 3. The first two columns list the factors and associated estimates of changes in the probabilities of applying to college; the second set of two columns lists the factors and associated estimates of changes in the probabilities of graduating from college. The purpose of this table is to show by how much the two sets of probabilities would change if the Pathways model effects are triggered by implementing various of the high priority options. That is to say, we hope to determine the extent to which the survey respondents–those key actors in the reauthorization process–gave high priority to the Specific Options that the Pathways research also indicates are likely to substantially improve student access and academic success.

Applying for College

For Family Encouragement/Involvement, consider the high-priority Specific Option to *Educate parents of different strategies for paying for college* (VII.d). The Pathways model does not include any factors that exactly match this Specific Option. One factor under Family Encouragement/Involvement, namely Financial aid information, can be viewed as having some connection to this Specific Option. The empirical estimate for this factor, five percent, suggests the potential effect of adopting the option. However, the Financial Aid Mix factors deal with the structure of student aid programs and have little or no connection to this option. None of the limited number of factors identify the likely effects of efforts to *Help parents of at-risk K-8 students influence their children to take advantage of opportunities designed to help them succeed academically* (III.e).[8] The negative effect for the risk factor suggests focusing attention on at-risk students by helping parents.

In the Preparation for College category, the linkages are weak. None of the high priority Specific Options calls for increased preparation for college, despite the fact that the Pathways College Qualifications factor (a composite of cumulative GPA, senior class rank, aptitude scores, and SAT/ACT scores) increases the probability of applying for college by 14 percent. The Pathways factors Parental Encouragement/Involvement factor is only weakly linked to the option *Encourage low-income students to take entrance exams and apply for college* (IV.a); the reason is that only one of six form of parental involvement encompasses student-parent discussions about how to prepare for and take ACT/SAT tests. None of the other high priority options in this category match any of the Pathways factors.

[8] Perhaps if the Pathways analysis were extended back to the kindergarten years, one or more factors would reveal the importance of such influence.

Moving down to the K-16 Communication/Engagement Pathway category, two factors are matched to it; namely, Help in college application, and Help in college essays. These factors appear to be, at best, only distantly related to the option *Provide supplemental support to after-school and summer programs for at-risk K-12 students* (III.b). In the next category of *Aspirations and Plans*, three aspiration-linked factors are listed (i.e., aspired to some college, to a BA degree, or to an advanced degree) but no high priority options match this category.

The best match comes in the category Awareness of College Characteristics, Admission Standards, & Costs. Here, the factors College qualifications and Information on financial aid are moderately linked to the three high priority options: *Inform parents of academic subjects needed by students to succeed in 4-year colleges* (IV.d)*, Inform high school students about different ways to finance college attendance* (VII.a), and *Inform high school students about the range of total college costs (e.g., tuition, room and board, transportation)* (VII.b). However, taking the needed academic subjects is only one of several items that make up the composite variable College qualification. Not unexpectedly, no matches that pertain to applying for college correspond to any of the four College Experience categories.

Finally, in the category Financial Aid Mix, two factors can be linked to the high priority option *Simplify and clarify eligibility for need-based aid* (IX.h). They are Information on financial aid and Help in financial aid procedures. However, these are not strong linkages. Finally, it should be noted that none of the other five high priority options chosen by respondents find any empirical support from the Pathways studies.

To review, the links are both vague and on average weak between the high priority Specific Options that survey respondents chose as most likely to improve students' likelihood of applying for and graduating from college, and the Pathways factors identified as actually affecting these probabilities. These weaknesses exist because of the still limited scope of the Pathways studies, as well as the limited range of the Specific Options presented to the respondents. Expressed another way, the correspondence between the high priority Specific Options and the Pathways estimates suggest that the impact of new research findings from the Pathways model in shaping the views of survey respondents is still quite limited. In short, it remains unclear whether implementing these options would produce any notable changes in students' access and success in college.

Graduating from College

Much the same story emerges when we examine the high priority options and the factors affecting college graduation. Because the focus of the HEA is primarily on student aid, we turn first to the Financial aid Mix category. The Pathways factors, Financial aid loans and Financial aid grants/scholarships, are both related fairly closely to three of the five Specific options, namely: *Increase size of Pell grants for low-income students who are admitted to college* (VIII.e)*, Increase funding levels for Pell grants* (VIII.a), and *Increase size of need-based grants provided by the federal government* (IX.i). But, these factors are less directly related to the remaining three options. In particular, Having a child is even less related except for the fact that doing so increases a student's need for financial aid.

Table 3: Matching the High Priority Specific Options with the Pathways Factors and their Associated Percentage Changes in the Probabilities of Applying to College and of Graduating from College

Categories	
College Decision	
Family encouragement/involvement Educate parents about different strategies for paying for college (VII.d) Help parents of at-risk K-8 student influence their children to take advantage of opportunities designed to help them succeed academically (III.e)	
Preparation for college Encourage low-income students to take entrance exams and apply for college (IV.a) Increase availability of pre-kindergarten programs so students arrive at school ready to learn (III.g) Raise teacher salaries to attract and retain high quality teachers (II.e) Reward teachers who receive training in high need academic subjects (II.c) Prepare teachers in urban settings to work with parents and community groups to improve learning (II.f) Train teachers and staff to evaluate student learning progress (II.d) Reward faculty for effective teaching (VI.a)	
K-16 communication/engagement Provide supplemental support to after-school and summer programs for at-risk K-12 students (III.b)	
Aspirations and plans	
Awareness of college characteristics, admission standards, and costs Inform parents of academic subjects needed by students to succeed in 4-year colleges (IV.d) Inform high school students about different ways to finance college attendance (VII.a) Inform high school students about the range of total college costs (e.g., tuition, room and board, transportation) (VII.b)	
College Experience	
Academic integration	
Social intergration	
Facilities/services	
Climate/diversity	
College Decision and College Experience	
Financial aid mix Simplify and clarify eligibility for need-based aid (IX.h) Increase size of Pell grants for low-income students who are admitted to college (VIII.e) Increase funding levels for Pell grants (VIII.a) Increase size of need-based grants provided by the federal government (IX.i) Improve coordination among need-based aid programs, tuition costs (XI.g) Help low-income students reduce total debt burdens (XI.f)	

Sources:
Column 2–Cabrera, A. F., & LaNasa, S. M. (2000, May 15). On the path to college: Three critical tasks facing America's disadvantaged. Center for the Study of Higher Education, Pennsylvania State University. Derived from Table 11 and converted to percentage figures.
Column 3–Cabrera, A. F., LaNasa, S. M., & Burkum, K. R. (2001, July 27). Pathways to a four-year degree: The higher education study of one generation. Center for Higher Education, Pennsylvania State University. Derived from Table 10 and converted to percentage figures.

	Factors Influencing Decision to Apply for College	Percentage Changes in Probability of Applying for College	Factors Influencing Graduation from College	Percentage Changes in Probability of Graduating from College
	Parental involvement Parental expectation of BA Parental expectation of adv. degree Financial aid information	7% 26% 22% 5%	High school encouragement-parents High school encouragement-friends	4% 5%
	College qualifications	14%	Moderately prepared Highly prepared College GPA Quality of Instruction One math course Two math courses Three or more math courses One science course Two science courses Three or more science courses	4% 12% 32% 8% 27% 29% 42% 21% 21% 29%
	Help in college application Help in college essays	11% 8%		
	Aspired for some college Aspired for BA Aspired for adv. degree	-1% 28% 34%	Collegiate aspirations	23%
	College qualifications Information on Financial Aid	14% 5%	Institutional prestige Satisfaction with costs	1% 0%
			Continuous enrollment Dropped courses 10-20% Dropped courses at least 20% Quality of instruction	23% -13% -27% 8%
			Out-of-classroom Counseling Worked on campus Having children	8% 1% 4% -22%
			Campus facilities	0%
	Information on financial aid Help in financial aid Procedures	5% 11%	Financial aid loans Financial aid grants/ scholarships Having children	10% 7% -22%

Turning to the four **College Experience** categories, we find Pathways factors in three of the four categories (all except Diversity/Climate). However, there are no high priority options in any of the four categories. Several reasons may account for gap. First, concerns about Diversity/Climate are a relatively recent issue, and consequently no information may have been available from the 1980 High School Sophomore data base that could reveal the impact of that factor. Second, the impact of the four **College Experience** categories has only recently been investigated. Hence, those people floating the options included in the survey may not yet have had time to formulate proposals that would address the various categories of **College Experience**. Third, little attention has been given by policy makers to what happens to students personally while they are in college, a lack of attention that has been of concern to students, parents, and institutions.

In conclusion, the results for the five Pathways categories linked to **College Experience** as they affect a student's probability of graduating are somewhat stronger than those for **College Decision**, as they affect a student's probability of applying for college.

Reflections

An important concern raised by this study is the gaps between the issues represented by the questions given to survey respondents and the important factors identified in the Pathways research. For example, few if any questions touched upon Academic Integration (students embracing or thriving in the academic life of a college) and Social Integration (forming agreeable social relationships with others in academic settings), even though research shows that these are critically important to students' success in college. Also, research shows that before any student is likely to be able to integrate academically and socially into a college setting, parents (or significant others performing parent-like roles) must have encouraged their children to acquire habits and practices necessary for satisfactory academic and social integration. For no group is this more true than for elementary and secondary school students at risk of failing school. We also know from research that conventional efforts to encourage parents of at-risk students (PTA meetings and parent nights at schools) often do not work well for this important target population.

VI. Conclusion

Summary

The approach to reauthorization illustrated here compares a wide array of policy options being considered and discussed in 2003 for the 2004 reauthorization with the results from the Pathways research findings. The focus is on those of the 86 Specific Options that were given the highest priority rankings in a Spring 2003 survey of five respondent groups whose own input to the reauthorization process is critical. The groups include two types of researchers (on education finance and persistence) and three types of policy analysts (in higher education associations, in federal and state governments, and in private philanthropic foundations that support education). The Pathways research drawn upon here addresses the probabilities of students applying for college and graduating from college. As a result of aligning the high priority policy options with the Pathways estimates, we find that the probable effects of these policy options vary widely, from having no effect to greatly influencing the probability of students applying to college and/or graduating from college.

We find that the overall match between the high priority options identified in the survey and the empirical effects that can be associated with them is not clear enough to confidently predict actions that would substantially improve higher education access and student success. In other words, if we want improvements of the magnitudes predicted by the Pathways (see Tables 2 and 4) we need closer connections than currently exist between Specific options and Pathways predictions.

This paper, in effect, proposes a new way of approaching the process of reauthorizing the HEA. Instead of allowing the agenda and its outcome to be determined by the unpredictable and highly-fragmented federal approach to legislation, we propose that the agenda should be set by research findings and the outcomes that can be predicted from these research findings. In other words, the body of research findings, particularly those from the Pathways model research, should be used to assess the likely effect on increasing access and student success in postsecondary education for each policy option being discussed.

Limitations

The approach presented here should not be taken as a roadmap to the 2004 reauthorization; much work is needed to refine it. First, the Pathways research used to illustrate the likely effects of adopting one option or another are not matched closely with the policy options, partly because the policy options are loosely defined, and partly because the Pathways estimates may encompass only one aspect of a particular policy option. Second, the Pathways studies used here do not include all the variables that ultimately affect students' access and success; rather they focus only on those outcomes that include completing college course requirements to graduating from college. Student success in high school depends importantly upon success at earlier stages in the school experience, including both elementary and middle school; and success at these early stages of schooling depends on the pre-school experience and home environment of young children. Until the Pathways model can be expanded to include a wider range of school and pre-school experience, difficulties will be experienced in assessing the likely effect of important policy options that deal with these earlier experiences and the important learning that does or does not take place then.[9] Third, the array of options presented in the survey reflected the options under discussion in early 2003, and hence did not include the full range of policy options that has emerged. Fourth, the priority ranking of these options at the time of the Spring 2003 survey may not reflect the priority rankings that would be given as of early 2004, now that more options are being discussed. For these reasons, some method may be needed to monitor changes in the priority rankings of the options as new options appear and are replaced by other options that are in effect eliminated from active consideration.

Implications

What are the likely implications of adopting this research-based approach to reauthorization? The most important effect would be the substitution of research-based knowledge to guide reauthorization, in place of the politically-driven process that has characterized public policy formation. Unless a change occurs, we will continue to follow

[9] Promising work is being done on another critical age span, that embraced in the Early Childhood Longitudinal Study Kindergarten Cohort (ECLS-K) which includes more than 20,000 children beginning kindergarten in the fall of 1998. See Fryer & Levitt, 2003.

blind and unproductive policy paths, initiating and funding programs of the kind that have done much less than widely expected to improve student access and success over the past 30 years, particularly for students from low income families.

Also important is the need for a broader and more integrated approach to enhancing student access and academic success. While reauthorizing the HEA can help deal with some of the factors affecting whether students apply to college and graduate from college, much of what needs to be done is beyond the scope of the HEA. Some options might be better addressed by the Elementary and Secondary Education Act (ESEA). Still other concerns fall outside the scope of governmental activity, and instead are the responsibility of the schools, the teachers, and, perhaps most importantly, with the students and their parents. Changing individual aspirations and behaviors remains a formidable challenge.

The move to a research-based approach has the potential to become what has been sorely lacking in recent reauthorizations, that is, a big new idea to guide the process. In light of large on-going expenditures on education research, and the growing volume of high-quality research associated with the Department of Education's national longitudinal studies, the time has come to capitalize on these developments. Moreover, the continuing weakness in the quality of American K-12 education points to the need for reforms that build on a solid empirical base rather than on the latest opinions and conjectures.

Recommendations

To guide the 2004 reauthorization process, we offer several practical recommendations: (1) avoid adopting wasteful and costly policies that are unsupported by recent research findings; (2) move quickly to find ways other than through the HEA of improving pre-school and K-12 instruction for all students but especially for at-risk students; and (3) begin planning how to build a strong research base to guide the next reauthorization of HEA five years from now.

The first recommendation, supported by survey responses and the Pathways model estimates, calls on those involved in the reauthorization to exercise caution. They should avoid promoting changes that fail to address persistent problems in the system. In other words, they should avoid adopting changes that have little if any possibility of producing improvement. For example, survey respondents overwhelmingly rejected regulatory "institutional reforms" such as postsecondary education standards or testing because, we suspect, they could not see how these approaches would actually remedy a host of problems, such as inadequate academic preparation of students before college, and figuring out how to guide parents, teachers, and others in helping at-risk students succeed academically.

The second recommendation is to help the key participants in the process (e.g., students and parents, schools and colleges, state and federal governments, private foundations, and national associations and citizen groups) to be well informed about the effectiveness of their own and others' efforts to improve access and student success. An important first step would be for a credible national agency, such as the American Council on Education, the Education Commission of the States, or a new national commission, to employ what is known from research to recommend effective ways to coordinate and focus the individual efforts of the key participants.

The third recommendation indicates that what happens in higher education is intimately linked to what happens in K-12 grades, pre-school years, and the home environment in the earliest years. Until and unless all students increase what, how much, and how well they learn, their chances of reaching college will be seriously handicapped. Hence, there needs to be greater coordination between legislation affecting college-going, such as the HEA, and the Elementary and Secondary Education Act (ESEA). Such an approach would enable researchers and postsecondary education institutions to better help K-16 institutions identify and deal with the barriers to learning students faced by many students.

The fourth recommendation is to build the HEA reauthorization on what works. This calls for expanding the scope of the Pathways model to embrace the educational development of children from birth to college. Any such effort will have to build on different and slightly overlapping data bases because it is impossible to wait until a new birth cohort is followed to age 18 and beyond. One possibility is to exploit the Early Childhood Longitudinal Study (ECLS). That study includes two overlapping cohorts: a Birth Cohort and a Kindergarten Cohort. The birth cohort follows a sample of children from birth through first grade; the kindergarten cohort follows a sample of children from kindergarten through the fifth grade. This means that the only missing link is for the years between the 5th and 8th grade.

We conclude that the conventional federal and legislative approaches have done too little to improve student access and success in higher education. Building policy on the empirical evidence from the Pathways studies seems like the logical way to go in giving new impetus to efforts to improve the education of America's youth. By adopting this approach we believe it will be possible to learn more quickly which policies and programs work best. We hope that this "big idea" can inject more vigor and effectiveness into this nation's continuing quest to improve student access and success in postsecondary education and in so doing improve the early education of American children leading up to their successful completion of college.

References

Adelman, C. (1998). The kiss of death? An alternative view of college remediation. National Crosstalk, 6(3), 11. San Jose, CA: National Center for Public Policy and Higher Education.

Adelman, C. (1999). Answers in the tool box: Academic intensity, attendance patterns and bachelor's degree attainment. (Document: PLLI 1999-8021). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Berkner, L. K., & Chavez, L. (1997, October). Access to postsecondary education for the 1992 high school graduates. (Statistical Analysis Report: NCES 98-105). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

Bers, T., & Smith, K. (1991). Persistence of community college students: The influence of student intent on academic and social integration. Research in Higher Education, 32(5), 539-56.

Cabrera, A. F. (2002, October 8). Paving the way to concrete: What matters? Paper presented at WISCAPE conference, Federal Postsecondary Education Policies: Implications for Institutions and Students, Madison, WI.

Cabrera, A. F., Colbeck, C. L., & Terenzini, P. T. (2001). Developing performance indicators for assessing classroom teaching practices and student learning. Research in Higher Education, 42(3), 327-52.

Cabrera, A. F., & LaNasa, S. M. (2000). Understanding the college choice of disadvantaged students. New Directions for Institutional Research. San Francisco: Jossey-Bass.

Cabrera, A. F., & LaNasa, S. M. (2001). On the path to college: Three critical tasks facing America's disadvantaged. Research in Higher Education, 42(2), 119-50.

Cabrera, A. F., LaNasa, S. M., & Burkum, K. R. (2002). Pathways to a four-year degree: The higher education study of one generation. Paper presented at the annual meeting of the Association for the Study of Higher Education, Sacramento, CA.

Cabrera, A. F., & Nora, A. (1994). College students' perceptions of prejudice and discrimination and their feelings of alienation: A construct validation approach. The Review of Education, Pedagogy, and Cultural Studies, 16(3-4), 387-409.

Cabrera, A. F., Terenzini, P. T., & Bernal, E. M. (1999). America's low-income students: Their characteristics, experiences, and outcomes. Report to The College Board. University Park, PA: Center for the Study of Higher Education.

Carnegie Commission on Higher Education. (1968). Quality and equality: New levels of federal responsibility for higher education. New York: McGraw-Hill.

Carroll, C. D. (1989). College persistence and degree attainment for 1980 high school graduates: Hazards, for transfers, stop-out, and part-timers. (Survey Report: CS-89-302). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Choy, S. P., & Premo, M. D. (1996). How low-income undergraduates financed postsecondary education: 1992-93. (Statistical Analysis Report: NCES 96-161). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Dougherty, K. (1992). Community college and baccalaureate attainment. Journal of Higher Education, 63(2), 188-214.

Endo, J. J., & Harpel, R. L. (1982). The effect of student-faculty interaction on students' educational outcomes. Research in Higher Education, 16(2), 115-38.

Flint, T. A. (1992). Parental and planning influences on the formation of student college choice sets. Research in Higher Education, 33(6), 689-708.

Flint, T. A. (1993). Early awareness of college financial aid: Does it expand choice? Review of Higher Education, 16(3), 309-27.

Fryer, R., & Levitt, S. D. (2003). Understanding the black-white test sore gap in the first two years of school. NBER Working Paper No. 8975.

Gladieux, L. E., & Swail, W. S. (2000). Beyond access: Improving the odds of college success. Phi Delta Kappan, 82(9), 688-92.

Gladieux, L. E., & Wolanin, T. R. (1976). Congress and the colleges: The national politics of higher education. Lexington, MA: DC Heath and Company.

Hansen, W. L., & Weisbrod, B. A. (1967). Benefits and costs of public higher education in California. Report to the Joint Committee on Higher Education, California State Legislature, Sacramento, CA.

Hansen, W. L., & Weisbrod, B. A. (1969). Benefits, costs and finance of public higher education. Chicago: Markham.

Hansen, W. L., & Weisbrod, B. A. (1969). Financing undergraduate education: A preliminary report on the Governor's Commission on Higher Education. Madison, WI.

Hansen, W. L., & Weisbrod, B. A. (1970). Financing undergraduate education, A forward look: Final report of the Governor's Commission on Education. Madison, WI.

Hansen, W. L., & Weisbrod, B. A. (1971). A new approach to higher education finance. In M. Orwig, M. (Ed.), Financing higher education (pp. 117-42). Iowa City: American College Testing Program, Inc.

Horn, L. J.,& Chen, X. (1998). Toward resiliency: At-risk students who make it to college. Washington, DC: U.S. Department of Education.

Jones, J. C., & Lee, B. (1992). Moving on: A cooperative study of student transfer. Research in Higher Education, 33(1), 125-40.

Kinnick, M., & Kempner, K. (1988). Beyond "front door" access: Attaining the bachelor's degree. Research in Higher Education, 29(4), 299-318.

Kraemer, B. (1995). Factors affecting Hispanic student transfer behavior. Research in Higher Education, 36(3), 303-22.

Lee, V., & Frank, K. (1990). Students' characteristics that facilitate the transfer from two-year to four-year colleges. Sociology of Education, 63(3), 178-93.

Merisotis, J., & Phipps, R. (2000). Remedial education in colleges and universities: What's really going on? Review of Higher Education, 24(1), 67-86.

National Educational Longitudinal Study of 1988 (with four follow-ups in 1990, 1992, 1994, and 2000). Washington, DC: U.S. Department of Education. National Center for Education Statistics. Institute of Education Sciences.

Nora, A., Cabrera, A. F., Hagedorn, L. S., & Pascarella, E. T. (1996). Differential impacts of academic and social experiences on college-related behavioral outcomes across different ethnic and gender groups at four-year institutions. Research in Higher Education, 37(4), 427-752.

Nora, A., & Rendon, L. (1990). Determinants of predisposition to transfer among community college students: A structural model. Research in Higher Education, 31(3), 235-56.

Olivas, M. A. (1985). Financial aid packaging policies: Access and ideology. Journal of Higher Education, 56(4), 462-75.

Pathways to College Network. (2004). A shared agenda: A leadership challenge to improve college access and success. Boston, MA: Author.

Perna, L. W. (2000). Differences in the decision to attend college among African Americans, Hispanics, and Whites. Journal of Higher Education, 71(2), 117-41.

Rivlin, A. M. (1969). Toward a long range plan for federal financial support for higher education. Washington, DC: Department of Health, Education, and Welfare.

Stampen, J. O., & Hansen, W. L. (2004a). Refocusing the HEA reauthorization to reflect the priorities of higher education policy analysts and researchers. Madison, WI: Wisconsin Center for the Advancement of Postsecondary Education.

Terenzini, P. T., & Cabrera, A. F., & Bernal, E. M. (2001). Swimming against the tide: The poor in American higher education. New York: College Entrance Examination Board.

Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. Journal of Higher Education, 68, 599-623.

Voorhees, R. (1987). Toward building models of community college persistence: A logit analysis. Research in Higher Education, 26(2), 115-29.

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