

**THE IMPACT OF INFORMATION AND
STUDENT AID ON PERSISTENCE:
A REVIEW OF RESEARCH AND DISCUSSION OF EXPERIMENTS**

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This report was commissioned by TERI to provide a review of existing research findings, focused on the impact of student aid program design, operations, and marketing. This report was prepared under the direction of Ann Coles (Senior Vice President of TERI, coles@teri.org) and David Mundel (a consultant to TERI, david.mundel@comcast.net).

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Executive Summary

Experiments with providing information on student aid programs should be informed by research on the impact of student aid, including research on persistence. Persistence research has examined the impact of aid, but not the role of information. This paper examines research related to the role of information in promoting persistence. No prior studies have examined the direct effects of information and encouragement on persistence. However, research on student aid, including research of the effects of prices and subsidies on persistence, can inform the design of experiments with early (pre-college) information. Research related to three approaches to providing was considered.

Type 1—Encouragement: Providing information on different types of student aid programs to encourage applications, without any specific information about the amounts of grant and loan aid students might expect to receive, or the costs. Since there is reason for concern about the amount of need-based aid available in many states, there are reasons to question whether information on student aid would actually promote persistence for low-income students. It is important to provide information about amounts of aid students can expect to receive even if appears limited. While research on encouragement has been limited, there is reason to question the value of encouraging students to apply for aid without providing information on the amounts of aid students can expect to receive.

Type 2—Information on Aid Awards: Providing students information about the amounts of government grants and loans they could expect to receive, at a given level of college costs. Information on the amounts of aid students are likely to receive could improve financial planning for enrollment and, as a consequence, modestly improve persistence.

Type 3—Guarantees of Grant Awards: Providing low-income students in middle schools and/or high schools with specific monetary commitments, probably as guarantees to meet tuition costs. Research on Indiana's Twenty-first Century Scholars Program indicates that aid guarantees can improve enrollment and persistence by low-income students.

Based on this review, it appears that a great deal could be learned from experiments with information on aid awards, coupled with guarantees of varied amounts of grant aid. While little is known about the role of early information in college persistence, it makes sense to consider experiments with information that include information on aid amounts. Experiments that vary the amounts of aid students are "guaranteed" would extend understanding of the role of information, guarantees, and aid amounts.

THE IMPACT OF INFORMATION AND STUDENT AID ON PERSISTENCE: A REVIEW OF RESEARCH AND DISCUSSION OF EXPERIMENTS

Introduction

Student financial aid is delivered through a complex structure of federal, state, and local agencies and organizations, as well as by thousands of colleges and universities. While there is substantial research on the impact of student financial aid on enrollment and persistence, there is very little research on how the student aid delivery system—the processes institutions, states, and the federal government use to make aid apparent and available to students—influences students' enrollment and persistence decisions.

In theory, an overly complex system of student financial aid delivery can discourage applications for aid and reduce enrollment and persistence. However, to substantiate this intuitive assumption, it is necessary to specify the features of the delivery system and examine research on the effects of these features on student enrollment and persistence. This paper examines the following questions:

- How can research on the effects of student financial aid, especially persistence research, inform the design of experiments on information for college students?
- Given the paucity of research on information and the state of knowledge about the effects of student aid, what types of information experiments merit consideration?
- How can analysis of the student aid delivery system inform the design of information experiments?

This review was written to inform efforts to design experiments on information provided to potential college students about student financial aid. One concern addressed in this paper is whether accurate information on student aid programs is available to students who are eligible or who might be eligible when they finish high school. In theory, if students have information about aid, they will be more likely to apply for aid, enroll in college, and persist in college.

Student Financial Aid and the Social Contract

The Higher Education Act (HEA), as reauthorized, provides the basis for specifying the social contract for assessing student financial aid and judging the adequacy of federal grants. The adequacy requirement, or social contract, for Title IV student aid is implied in the legislative intent of the title, which is focused explicitly on promoting equal opportunity. Consistent with legislative intent (see Gladieux & Wolanin, 1976; National Commission on the Financing of Postsecondary Education, 1973), the objectives of Title IV are generally defined as:

- *Access to higher education*, especially for low-income students who would not otherwise have the opportunity to attend;
- *Choice of college*, especially the removal of financial barriers for enrollment in public and private colleges that low- and moderate-income students are qualified to attend; and
- *Persistence to the extent of goals and ability*, removing financial barriers for completion of undergraduate degrees.

These criteria are not consistently applicable across historical periods, however, because the target populations for student aid programs have changed over time, along with the definitions of college qualifications. It is crucial to consider these trends before defining the social contract for access to and persistence in higher education or considering how research can help us judge whether student aid has been sufficient to meet the social contract articulated in federal legislation.

Changing Contexts for Federal Access Policy

The target population for the equal education opportunity goal shifted somewhat in the late 1970s. The Middle Income Student Assistance Act (MISAA) reauthorized the HEA in 1978 with an emphasis on middle-income students, expanding eligibility to Title IV grant and loan programs to include that group. While this liberalization process was accelerated in the 1980 reauthorization of the HEA, it was apparent soon after the passage of MISAA that the federal government lacked the will to fully fund federal grant programs to reach these new authorization levels. During the 1980s the Reagan administration reconstructed federal student aid programs, largely through the budget process, to increase the use of loans as means of meeting the goals of access, college choice, and persistence for students from low- and middle-income families who had unmet financial need for college enrollment. In addition, the Reagan and Bush administrations retargeted grant aid on low-income students (Hearn, 1993).

While there was robust research on the impact of grants in the 1960s and 1970s, federal support for such research was redirected in the 1980s. There were few government funded evaluations of the effects of student financial aid on equal opportunity during the 1980s. Released reports paid little attention to equal opportunity for low-income students and focused instead on the positive effects of loans (e.g., St. John & Noell, 1987). Government restrictions prevented release of federally funded reports that focused on the effects of grants and loans on low-income students. The focus at the U.S. Department of Education during the Reagan administration was on critiques for excessive spending in colleges (Finn 1988a, 1988b) and for raising tuition to maximize revenue from student aid (Bennett, 1987; Carnes, 1987). Since this rationale was not dependent on information about student aid, there was little emphasis on research on the efficacy of aid.

The Reagan administration also shifted the focus of the access debate to non-financial issues. The official policy research on access began to consider the role of variables other than student financial aid as explanations for the new disparity in postsecondary opportunity, thus building research support for the argument that access, college choice, and persistence had been equalized. The initial studies of the gap in opportunity for African Americans were conducted in response to criticisms that had drawn links between reductions in federal grants and decreases in participation rates of African Americans (Chaikind, 1987; Pelavin & Kane, 1988). This federally sponsored research, which focused on the role of preparation and the finding that math courses were linked to enrollment (Pelavin & Kane, 1988), received notice and was republished by the College Board (Pelavin & Kane, 1990).

Subsequent studies conducted during the Clinton and Bush administrations carried forward the argument that access, college choice, and persistence were equal for students who prepared

(National Center for Education Statistics [NCES] 1997a, 1997b, 2001). Not only did these studies extend the method begun during the Reagan era of not considering the direct effects of student aid when making claims about equal opportunity, but they made serious statistical errors (Becker, 2004; Fitzgerald, 2004; Heller, 2004a; Lee & Clery, in press). Therefore, there is reason to reexamine the research on the effects of student aid, including studies conducted by researchers who conducted studies with federal databases but were not funded and reviewed by NCES. The studies of interest are those reviewed by academic journals, since they generally hold higher statistical standards than the NCES reviews.

While the intent of federal legislation on student financial aid was largely ignored by educational researchers after 1990, the goals of access, college choice, and persistence continue to be the intent of Title IV. There is now a vital need to learn from research on academic preparation when reframing the social contract for education policy research. Given the new focus on preparation as a goal, possibly as a predecessor event to college access, we need to reconstruct our understanding of the social contract for student financial aid programs. While preparation is not a legislated goal, it can no longer be ignored by policy researchers, as advocacy researchers for the American Council on Education have argued (King, 1999a, 1999b). It is important to reconstruct definitions of the social contract in ways that show balance, considering both the goal of promoting equal opportunity—the legislative intent—and the newer concerns about preparation and ability to benefit.

The Social Contract

A standard for the social contract must integrate the legislative intent of Title IV, but it should be informed by the contributions of research on preparation and the political and social advocacy of this research community. The following definitions of the *social contract* put forward the legislative intent of federal student aid but also reflect newer concerns about preparation:

- *Academic Preparation*: Students in middle schools and high schools should have equal opportunity to prepare academically for college, regardless of their income or the locales of their schools.
- *Access*: Students who prepare academically for college should have the opportunity to enroll, regardless of their financial means.
- *College Choices*: Students who prepare for enrollment in four-year colleges should have the opportunity to enroll there, if admitted, regardless of their family income.
- *Persistence*: Students should have the opportunity to persist through undergraduate programs in colleges of choice to the extent of their goals and ability, regardless of their family income.

These definitions provide a basis for judging the outcomes of student financial aid in research that considers the role of background, achievement, goals, and financial aid (and information about that aid). Trend analyses that examine the changes in levels of aid and rates of achievement for diverse income groups or different race/ethnic groups can establish relationships between student aid changes and outcomes. For example, a substantial gap in college enrollment rates across ethnic and income groups opened after 1980. Trend analyses indicate that policy on financial aid provides a more plausible explanation for the opening of the gap than the alternative

explanations (St. John, 2003). Specifically, information on preparation from federal studies probably encouraged more students to prepare and enroll, rather than discouraged these behaviors. Information that loans were available may also have encouraged enrollment by middle-income students. Information on the declining value of Pell awards could have influenced the decline in enrollment rates after 1975. Since we have no research on perceptions these conclusions are speculative.

A Quality Standard for Research

Trends alone do not provide sufficient evidence that the social contract, as restated above, has been met. Careful analyses of cross-sectional and cohort databases, using appropriate multivariate methods, are also needed. The standards of logic for judging whether or not the social contract has been met must have sufficient control for factors known to be related to outcomes, given understandings from theory and research in sociology, economics, and education. The four outcomes are considered below.

Preparation: Analyses of the effects of expected student aid and information on preparation for college would need to control for impact of background (e.g., family income, parents' education, and ethnicity), school characteristics (e.g., locales and curriculum options), goals/aspirations, and prior achievement in middle school preparation. *To inform public policy relative to the social contract, such studies must consider the effects of policy variables on equalities/inequalities in preparation across racial and income groups, with appropriate statistical and logical controls.* There are a few well-designed studies that meet this standard, and a few more such studies are in preparation. The studies to date focus on Indiana's Twenty-first Century Scholars Program (Musoba, 2004; St. John, Musoba, Simmons & Chung, 2002; St. John, Musoba, Simmons, Chung, Schmit & Peng, in press) and the Washington State Achievers Program (St. John & Hu, 2004). These studies indicate that providing a guarantee of aid improves the chances that low-income students will prepare and enroll. In addition, analyses of funding for state grant programs reveal that merit programs were negatively associated with high school graduation rates (St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004), further indicating that information on aid influences preparation.

Access: Analyses of the effects of information and student aid on whether students enrolled in college should control for background, preparation, school characteristics, goals/aspirations, and achievement. *To inform public policy relative to the social contract, such studies must consider equality/inequality in opportunity to prepare across income and race/ethnic groups.* Numerous studies meet this standard for student financial aid, but fewer studies have explicitly examined the role of information. Studies of both the Hope Scholarship Program (Heller & Marin, 2002) and the Twenty-first Century Scholars program illustrate that programs that provide guarantees influence enrollment. Further, a study of state funding for grant programs confirms that funding for both need-based and non-need (merit) grant programs was positively associated with enrollment rates (St. John, Chung & Musoba, 2004). This research assesses the direct effects of student aid on enrollment rather than the effects of information.

College Choice: While the older standard for college choice considered both public and private college, there are now serious questions about whether diverse students have equal opportunity to enroll in four-year colleges. Analyses of college destinations (i.e., the types of colleges in

which students enroll) provide an appropriate means of examining this outcome. Specifically, such studies should consider whether students with similar preparation and achievement have relatively equal opportunity to enroll in four-year colleges. Such studies should control for background, school characteristics, preparation, goals/aspirations, and achievement. *To inform public policy relative to the social contract, college choice studies must consider equality/inequality across diverse income and race/ethnic groups.* Very few recent studies have met this standard, but a few are in preparation.

Persistence: Analyses of the effects of student financial aid on persistence must control for background, school characteristics, preparation, goals/aspirations, college characteristics, and college achievement. *To inform policy relative to the social contract, persistence studies must consider equalities/inequalities across income and race/ethnic groups.* There is a substantial body of research on this outcome. However, most of the research has focused on the influence of financial aid. No studies have examined the influence of information and encouragement on persistence. Two studies of the Twenty-first Century Scholars Program have examined persistence, but these studies examined the effects of student aid rather than of the information provided or the initial commitment.

Interpretation of the research on the effects of financial aid on persistence, including summaries and syntheses, should also consider what is known about enrollment and college choice, given the direct linkages between these outcomes. This research is reviewed below, after more explicit consideration of criteria for judging aid adequacy.

Judging Whether the Social Contract Has Been Met

The effects of student financial aid during different historical periods are dependent on the policies in place during those periods (Dresch, 1975), thus constraining generalizations of price response measures across time. Multivariate studies of cross-sectional and panel databases, if they meet the criteria above, should be reviewed in particular. It is important to build understanding of aid within historical periods. The review method used in *Refinancing the College Dream* (St. John, 2003) provides an appropriate approach to the review of cross-sectional studies that meets the quality standard of historical understanding.

Two approaches to evaluation of the effects of student aid are widely used: 1) net cost, usually measured as tuition charges minus grant dollars, or as cost of attendance minus grant dollars and loan subsidies; or 2) the effect of tuition charge and aid amounts on types as independent variables. Evidence from both approaches to evaluation and policy studies can inform the design of information experiments.

Studies of the impact of net cost or net price are widely used by economists. Research using this approach has consistently found a relationship between net prices and enrollment (Heller, 1997; Jackson & Weathersby, 1975; Kane, 1995, 1999; Leslie & Brinkman, 1988; McPherson, 1978; McPherson & Schapiro, 1991, 1997). This research consistently finds that increases in the amount of grant aid can improve enrollment by low income students. Price response measures can be used to estimate the effects of increasing aid amounts. For example, the recent study of funding for state student grant programs estimated that had states met an “equity standard” of

coordinated need-based grant aid with tuition, an additional million low-income students would have had the opportunity to enroll (St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004).

The problem with the net price approach is that it is difficult to set a reasonable standard. Since this method simply indicates an enrollment ratio, it does not relate directly to the standards outlined above, unless a standard of practice is defined. For example, the study of state funding (St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004) set an equity standard for funding per full-time equivalent enrollment (FTE) in relation to tuition charges. While this approach is intuitively reasonable, this approach to setting a standard is not clearly and explicitly related to legislative intent, especially in states.

The second approach provides evaluative information related to the outcomes above. The differentiated price approach involves examining tuition and student aid independently. When net price analyses and differentiated price analyses are compared, the differentiated price approach has explained more variance (St. John, Andrieu, Oescher & Starkey, 1994; St. John & Starkey, 1995a, 1995b). In addition, this approach, when used with appropriate controls, provides an indication when financial aid equalizes opportunity across income groups.

The Effects of Student Aid

There has been substantial research about the impact of grants and loans on student enrollment and persistence. Somewhat less is known about the impact of work-study, at least from recent research. This section summarizes what is known about the impact of aid on persistence, a potential source of information on student aid for an experiment with information dissemination. As summarized in Table 1 (page 17), research indicates that need-based grants have a substantial influence on enrollment and persistence. There is also growing evidence that state merit grants influence enrollment, although not to the extent of need-based grant aid (Heller, 2004b; St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004).

In the 1970s and 1980s, several researchers examined the impact of student aid on graduation (e.g., Astin, 1997; Terkla, 1985). Since student aid packages and amounts frequently change from one year to the next, this approach gave way to within-year and year-to-year persistence models in the 1980s. However, with the new programs that provide aid guarantees, it will be possible to compare students who receive these guarantees and other aided students to students who do not receive student aid. For these programs it will be possible to consider persistence to graduation once again. The author has been funded for such a study of the Twenty-first Century Scholars program.

The fundamental issue with respect to the effects of grant aid is whether, at given levels of students' ability to pay (measured need using a generally accepted methodology), the amount of grant aid is sufficient to have a positive association with persistence, given college costs. Net price research (subtracting grants for tuition) has consistently shown an impact of aid on enrollment. However, given that grants, loans, tuition, and living costs can all have independent effects, it is appropriate to consider each set of effects (Dresch, 1975; St. John & Starkey, 1995a, 1995b). The differentiated effects approach involves examining the impact of the amounts of

tuition, grants, and loans as independent variables, rather than as a single net price. Substantial persistence research has been conducted using the differential effects approach (St. John, 2003)

Research using the differentiated effects approach shows a different relationship: the effects of grants can be positively or negatively associated with persistence, controlling for student background (including income) and tuition. Research using this approach consistently finds there is a measurable threshold for aid effects (St. John, 2003). Although no attempt has been made to relate these evaluative measures to prediction of enrollment, it is apparent that when aid amounts change over time the measurable effects of aid also change cross-sectional analyses of cohorts influenced by different aid policies (St. John, 1999; St. John, 2003). Specifically two studies have used cross-sectional studies for multiple academic years to examine how differences in funding for state grants influence persistence in different academic years (St. John, 1999; St. John, Hu & Weber, 2001).

Historically, researchers questioned the effects of loans on persistence. For example, Astin (1975) found that loans had a positive association with persistence, but called this finding an “artifact.” It has been well documented loans improve both enrollment and persistence for students who enrolled in the 1980s and 1990s (St. John, 1990a, 1990b, 1991, 2003; St. John, Kirshstein & Noell, 1991). However, there is still need to examine the effects of different types of loans, including unsubsidized and parent loans.

Early research indicated that work-study had a positive association with persistence (Astin, 1975; St. John, Cabrera, Nora & Asker, 2000). However, there is reason to question the effects of work-study if hourly rates are too low or if the student must work too many hours to pay the costs of college (St. John, 2003).

Thus, while student financial aid has an influence on both enrollment and persistence, there are still uncertainties about the impact of some different types of aid, including merit grants, unsubsidized loans, and work-study. The aid packages approach to persistence research compares different types of aid packages to no aid using a design variable set. These studies can find positive and significant coefficients for aid packages, no significance, or negative and significant associations. There is substantial evidence from this body of research that negative coefficients from these package models indicate inadequacy, controlling for other variables (e.g., background, achievement, etc.).

Given this uncertainty about the effects of aid, there are obvious limits to what can be said in advance of college about the adequacy of grants or loans. Some low- and middle-income students drop out due to misperceptions of the aid package relative to their ability to afford continuous enrollment. Information can be misstated. Given what is going on with pricing-hidden costs—students have difficulty knowing costs. Such ambiguity can make aid less valuable. While it is possible to provide information about the probability of receiving some type of aid, it remains difficult to provide reliable information about whether the types of packages students will be offered will be adequate. In the future, research on the effects of aid should be more closely linked to research on the role of information if the effects of both are to be better understood.

Understanding the Roles of Information

The review above provides an overview of three possible approaches to providing early information: 1) informing students about aid programs without specific information on award amounts, 2) informing students about the amount of aid they can expect to receive, and 3) providing low-income students with guarantees that they will receive grant awards that equal tuition charges (or the cost of attendance). Experiments with information linked to variations in aid amounts might provide useful information to policymakers who are concerned about improving college access.

Table 1
The Effects of Financial Aid on Persistence: Linkage Structures, Hypothesized Relationships, and Related Evidence

Program Features	Linkage Structures	Hypothesized Relationships	Evidence
Types of aid (grants, loans, work)	Loans <ul style="list-style-type: none"> • Subsidized • Unsubsidized • Parent 	<ol style="list-style-type: none"> 1. Loans influence enrollment and persistence 2. Loans have different values to different group 3. Subsidized loans have different effects than unsubsidized loans 	<ol style="list-style-type: none"> 1. Support (loans have an effect)¹ 2. There are differences in effects for different income groups² 3. Not sufficient research³
	Grants <ul style="list-style-type: none"> • Need based • Merit based • Hybrid 	<ol style="list-style-type: none"> 1. Need-based grants influence enrollment and persistence 2. Merit grants influence enrollment and persistence 3. Merit grants influence preparation 4. Need-based grants influence preparation and graduation 5. Combining merit and need can improve efficacy of grants 	<ol style="list-style-type: none"> 1. Substantial for persistence and enrollment⁴ 2. Substantial support on enrollment; mixed for enrollment and persistence⁵; Smaller effect size for merit aid than need-based aid 3. Negative effects on high school graduation rates confirmed⁶ 4. Partial support from studies of Twenty-first Century Scholars⁷ in Indiana 5. Mixed Results⁸
	Work <ul style="list-style-type: none"> • Work-study programs • Work to pay for college • Work as primary 	<ol style="list-style-type: none"> 1. Work-study influences academic integration and persistence 2. Working off campus can decrease odds of persistence 	<ol style="list-style-type: none"> 1. Early studies indicated positive effects of CWS⁹; Recent studies indicate negative effects, raising concerns about excess hours & low hourly rates¹⁰ 2. Partial support¹¹

The Role of Early Information on Access and Persistence

The current debates about educational attainment frame the significance of the study of the student financial aid delivery system and, therefore, merit review. Since there has been only limited research on early interventions that provide early information, we consider how research to date informs a general understanding of the possible roles in interventions that emphasize providing information on student financial aid to students in middle schools and high schools.

The dual nature of access challenges should be considered in efforts to untangle the relative effects of finances and academic preparation. Two types of access—financial and academic (St. John & Musoba, in press; St. John, Musoba & Simmons, 2003)—should be considered in studies that examine the causes and cures of the opportunity gap:

- *Academic access* refers to meeting standards for admission to a four-year and/or a two-year¹² college (related to academic qualifications) and can be influenced by efforts to improve K-12 education.
- *Financial access* refers to the ability to afford initial and continuous enrollment in a two-year and/or four-year college and can be influenced by government and institutional aid subsidies, college costs, and family income and savings.

Clearly, public policy on education needs to emphasize academic access, especially preparing students for enrollment. However, it is equally crucial that public policy address financial access. Using the above definition of financial access helps distinguish three possible approaches to providing information on student financial aid to students in middle schools and high schools.

Types of Information on Aid

Type 1—General Information: Encouragement is defined as providing information on different types of student aid programs to encourage applications, without any specific information about the amounts of grant and loan aid students might expect to receive or the costs.

This approach to providing information would hold at least one of the following assumptions: 1) that student financial aid is sufficient to ensure financial access and/or 2) that providing information about the programs that exist would enable more students to piece together a financial strategy that would help them pay for college. Research using the differentiate price approach indicates that financial aid has not been adequate since the early 1980s to ensure equal opportunity for persistence. Unfortunately, this straightforward approach to evaluation is not used by a large number of researchers and is not generally accepted.

The alternative is to relate price response to trends analyses. There is clearly unequal opportunity for low-income students to enroll and persist compared to middle- and high-income, a conclusion supported by trend analyses, descriptive studies, and qualitative studies (St. John, 2003). Some researchers have focused on parents' education (Choy 2002, NCES 2002), a variable highly related to income because low education usually leads to low-income (Pascarella & Terenzini, 1991; Paulsen, 2001a, 2001b). Reanalyses of the NCES reports illustrate large

disparities for low-income, college-qualified students (Fitzgerald, 2004; Lee & Clery, in press). Therefore, there is no reason to dispute the belief that opportunity is unequal, especially since NCES arguments about preparation have been proven to have serious statistical errors (Becker, 2004; Heller, 2004a).

If we relate trends to what is known from price response studies, then it is apparent that the current disparities in opportunity for low-income students are related to price response. Low-income, college-qualified students would need to receive more grant aid to have opportunity equalized in comparison to similarly qualified and motivated students with similar aspirations. This research suggests that a) low-income students who are concerned about college affordability have an understanding of the situation they face and b) if low-income students enroll in college they will face financial hardship, as illustrated by the persistence research reviewed above. The question is whether and when more information would be helpful. Information on aid programs could be deceptive unless it addresses the aid deficiency in states that lack adequate need-based grant aid. Given the extensive knowledge base on price response, it is important to consider the role of net prices and net costs in early information programs.

Type 2—Information on Expected Aid Awards, is defined as providing students information about the amounts of government grants and loans they could expect to receive, at a given level of college costs.

This approach to providing information would hold at least one of the following assumptions: 1) students can make more informed decisions if they have accurate information about the amount of aid they can expect to receive and/or 2) interventions that guarantee that students will receive a specified amount of aid if they meet certain predefined criteria (related to merit and/or need) will increase the chances of enrollment and persistence.

Providing students with accurate information about the amount of financial aid they are likely to receive poses two sorts of difficulties. First, since state and federal grant aid varies from year to year (St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004), it is difficult to provide accurate information unless programs are changed to guarantee a level of student grant aid. Second, if aid remained at the levels evident during the past decade or so, students in most states would not receive sufficient aid to equalize opportunity to persist, as noted in the extensive reviews above.

While information on current programs would influence enrollment, it probably would have only a modest effect on persistence. The only reliable and truthful information on amounts of grant aid would be that future grant amounts will be politically determined. One could conceive of providing this information as a political strategy to alert the electorate of the need to lobby and vote. However, a political venture of this type is unlikely to receive support from foundations or government agencies, at least those that are serious about studying the consequences of the strategy.

Type 3—Guaranteed Aid, is defined as providing information for low-income students in middle schools and/or high schools about aid with specific monetary commitments, probably as guarantees to meet tuition costs and possibly contingent on academic behavior.

This approach to revising the early information system to make specific guarantees to low-income students has been field tested by Twenty-first Century Scholars in Indiana, Washington State Achievers (WSA) in Washington state, and Gates Millennium Scholars (GMS) on a national basis. Research on these programs provides a partial information base as a conceptual yardstick for rethinking the role of early information.

Research on merit aid programs that provide a guarantee along with research on the two state-level programs that provide need-based grants (Twenty-first Century Scholars in Indiana and Washington State Achievers) illustrates that this method works well, especially in access (Musoba, 2004; St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004; St. John & Hu, 2004; see also review above). These programs have two features that merit consideration: a) a guarantee of a specific amount and b) a link of the amount of aid to tuition. This approach works well. An alternative might be to have a guarantee of an aid amount, possibly linked to need and preparation, but to vary the aid amount in a series of experiments.

In addition, federal GEAR UP programs often include some form of scholarship guarantees. Further study of the effects of these programs might help inform policy development on aid guarantees and award levels. However, further research is needed on the GEAR UP programs.

Based on this review, it is apparent that public policy can be informed by experiments with information and guaranteed grant amounts coupled with designed variations in aid amounts. Since so little is known about the role of information and there is still argument about the adequacy of federal student aid, it makes sense to consider experiments with information that include variations in aid amounts. This approach to information experiments would have three specific advantages:

- It would test the role of an aid guarantee in relation to early information.
- It would test the extent of price effect on different levels of student grant aid.
- It would permit testing different models of aid eligibility, including new hybrid forms of aid that combine merit and need to establish aid levels.

This approach to information experiments goes beyond the issue of information alone. There is good reason to conclude information on current programs would be problematic (see discussion of Types 1 and 2). Therefore, there is good reason to consider combining experiments that test different features of student financial aid programs with aid guarantees in experiments that provide early information. Such experiments could vary the guaranteed aid amount and the merit criteria.

Experiments with Information and Grant Program Features

If aid is below the level necessary to ensure continued enrollment by low-income students, it is doubtful that information would make a difference in persistence. Therefore there is reason to question whether information on aid availability, assuming current levels of funding for grant programs, would have an influence on persistence. Certainly there is not research to suggest that information alone would make a difference. However, there is also not research that disputes claims about the role of information in the persistence process. However, there is substantial evidence from research on programs that provide early guarantees—both merit programs and need-based programs—that the guarantee of an aid amount influences preparation behavior. Merit-based programs discourage high school graduation (St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004). For example, high school graduation rates dropped from 63.7% in 1992 to 52.3% in 2000 after Hope Scholarships were implemented in Georgia. In contrast, there is evidence that programs that guarantee that grants will meet costs of attendance for low-income students who prepare for college result in higher enrollment and persistence.

Therefore, it is appropriate to consider experiments designed to test the use of guarantees as part of an early awareness program. Not only is it appropriate to consider guarantees to meet costs for the lowest income students, but a range of other alternatives could be considered, including experiments with variable amounts of aid guarantees, possibly coupled with different levels of merit requirements. Such experiments could inform policy on the development of student aid programs.

The Student Aid Delivery System

Experiments that attempt to provide accurate information on student financial aid will involve adaptations to the delivery system. This section reviews the relationship between the research on student financial aid and the student financial aid delivery system. Since experiments that would provide information about aid amounts would require modification of the aid delivery system, it is important to consider the features of this system if its goal is to reduce uncertainty. The purpose of this review is to consider how the components of the delivery system should be adapted to accommodate experiments with information and grant guarantees.

The major subsystems of the delivery system (St. John & Robinson, 1985; St. John & Sepanik, 1982) are outlined below (see also Table 2), along with linkages to information experiments noted in *italics*:

- *Preapplication*: preparation for the award year, including early information for students and funding for programs. To understand the preapplication processes, it is also important to understand the influence of different types of student aid. Early information would be provided as part of the preapplication process. *For example in Indiana and Washington, the state student aid agencies coordinate planning for the annual aid process, including budget planning, with the administration of these programs.*

- *Application*: the processes that support applications for student financial aid, including application forms and need analysis methods. *Experiments that involved aid guarantees would require alterations in the aid application process, as in the case of Twenty-first Century Scholars in Indiana and WSA awardees in Washington state.*
- *Award*: the processes associated with the aid offered by colleges and associated decisions about choosing a college and taking on debt. *If students receive guarantees as part of an experiment, it is necessary to make minor changes in the award process, including changes in interfaces with aid offices at colleges and universities.*
- *Disbursement*: the processes that support the disbursement of aid to colleges and students, along with the processes of paying college bills. *If the experiments include guarantees, it is necessary to think through the linkages to the disbursement system.*
- *Reconciliation*: the processes of reconciling bills and payments between colleges and government agencies and between students and funding agencies, including debt collection. *If students have obligations during college (e.g., maintaining a minimum GPA) then the experiment will need to make adjustments in the annual reconciliation process.*

Identifiable features of each of these subsystems are examined in Table 2. Subsequent sections of the report provide the following analyses of research in relation to features associated with each subsystem. The review method examines

- Program features
- Linkage structures (mechanisms within the aid delivery system related to program features)
- Hypothesized relationships (propositions about the ways program features might relate to preparation, enrollment, and/or persistence)
- Summary of evidence (supported by endnotes and references)

Following Table 2, the subsystems of each review are considered using this structured approach. In addition, the summary of each section considers the implications of the review of the design of experiments with early information and grant guarantees.

Table 2
Subsystems and Features of the Student Aid Delivery System

Subsystems	Program Features
Preapplication	<ul style="list-style-type: none"> • Types of aid (grants, loans, work) • Determination of eligibility criteria • Award amounts (maximum awards: need and/or merit) • Award schedules/procedures • Advance information about programs • Guarantees of eligibility and/or award amounts • Outreach and encouragement to potential students (TRIO) • Collaborations on outreach (between colleges, states, and the federal government on outreach programs)
Application	<ul style="list-style-type: none"> • Number of applications required of students (single application and/or program specific applications) • Complexity of application and need analysis • Deadlines for applications • Linkages between applications (e.g., use of federal applications by state grant programs)
Award	<ul style="list-style-type: none"> • Timing of federal Pell award • Timing of state awards (and linking to colleges) • Application and admission (advance application v. open enrollment) • Campus award offers • Private aid offers (National Merit, philanthropy, etc.) • Student acceptance of aid offers
Disbursement	<ul style="list-style-type: none"> • Government disbursements to institutions • Institution disbursements to students • Other disbursements to students (lenders, Pell contractors, etc.) • Student decisions about loans (and changes in decisions about loans) • Student decisions about work
Reconciliation	<ul style="list-style-type: none"> • Bursar bills for unpaid accounts • Repayment of loans • Reconciliation: government systems and institutions • Reconciliation: institutions and students

Preapplication Processes

Innovations in information about student financial aid would necessarily be implemented within preapplication processes, although some could also influence subsequent subsystems. Since information about student financial aid relates both to the types and amounts of aid available as well as to information about aid, the review (Table 3) considers both types of aid and other features of the system. Research on the impact of preapplication processes on college enrollment and persistence has been limited.

- *Determination of Eligibility Criteria:* Eligibility criteria for government programs—both need-based and merit-based—are legislatively established and therefore can be changed over time. Research on the effects of changes in eligibility criteria is limited. *If an intervention program, such as an experiment aimed at providing information on expected government aid, altered eligibility, the effects of this change could be compared to a population that was not included in the experiment.* Research on WSA and GMS programs indicates the eligibility determination process is crucial (Sedlacek, 2004; Sedlacek & Sheu, in press).
- *Award Amounts (Maximum Awards: Need and/or Merit):* Maximum award amounts and award schedules are politically determined. It would be extremely difficult to untangle the effects of uncertainty about information on aid amounts from the effects of amounts of aid. However, the topic merits study. *As noted above in the discussion of propositions related to specific linkages, the type of information intervention chosen will link to student outcomes—from preparation through persistence in different ways.* The studies of GMS (Lee & Clery, in press; St. John, Chung, Musoba & Simmons, 2004) indicate that guarantees that aid will meet tuition or costs (GMS meets unmet need) indicate that providing guarantees of aid amounts has an influence on college choice and persistence.
- *Award Criteria:* The issues of the ability to measure need are not entirely distinct from the impact of having to provide complex and detailed information. The more information requested, the more likely it is that more individuals will have trouble filling out forms. There continues to be a need to study whether simplifications of applications influence the completion of aid applications and the amount of aid awarded.
- *Advance Information About Programs:* It is possible that information about aid can increase applications for college and aid. Hossler's research indicates a relationship (Hossler, Schmit & Vesper, 1999), although this work is largely descriptive.
- *Guarantees of Eligibility and/or Award Amounts:* Research from the Twenty-first Century Scholars Program (Musoba, in press; St. John, Musoba, Simmons & Chung, 2002) and Washington State Achievers (St. John & Hu, 2004) indicates that providing guarantees to low-income students that they will receive grants equaling tuition appears to have a positive influence on enrollment. Research also indicates that the money provided improves persistence (St. John, Musoba & Simmons, 2003).
- *Outreach and Encouragement to Potential Students (TRIO):* Review of trends indicates that TRIO along with Pell could have helped improve opportunity to enroll in the 1970s, but this information is largely descriptive. Specifically, implementation of TRIO in the 1960s and 1970s corresponded with the equalization of enrollment rates across ethnic groups in the mid- and late 1970s (St. John, 2003). Student aid and the sustained effects

of ESEA Title I provide other possible explanations for these trends. However, trends do not indicate causal relationships, so these linkages are largely speculative.

- *Collaborations on Outreach (between colleges, states, and the federal government on outreach program)*: The federal GEAR UP program has created new programs that provide outreach. There is a need for further study of this program.

By definition, experiments with early information require changes in the preapplication processes. In particular, if the experiments include guarantees of financial aid, then the experiments have implications for budgeting. If these features were carried forward from experiments into subsequent practice, then government agencies would need to adjust budgeting to carry through on aid guarantees. In addition, new early information processes would be required, as noted above.

Table 3
The Effects of Preapplication Processes on Persistence: Linkage Structures, Hypothesized Relationships, and Related Evidence

Feature	Linking	Hypotheses	Summary Evidence
Determination of eligibility criteria	Congress and state make decisions each year	<ul style="list-style-type: none"> • Uncertainty about eligibility can reduce persistence • Stability of eligibility could can reduce uncertainty and improve persistence 	<ul style="list-style-type: none"> • Partial support¹³ • Partial support¹⁴
Award amounts (maximum awards)	Congress and states make decisions (in laws and budgets)	<ul style="list-style-type: none"> • Uncertainty about aid decreases enrollment and persistence • Stability can improve enrollment and persistence 	<ul style="list-style-type: none"> • Untested • Partially Supported¹⁵
Award criteria (measures of need and/or merit need)	<ul style="list-style-type: none"> • Need and/or merit bases for awards can be set by law • Annual budgets can override law 	<ul style="list-style-type: none"> • Uncertainty about aid amount reduces efficacy of aid in enrollment and persistence • Certainty about aid improves efficacy of aid in enrollment and persistence • Guarantees of aid amounts equaling tuition (ensure cap of grant aid for high need students) can reduce uncertainty and improve efficacy (in enrollment and persistence) 	<ul style="list-style-type: none"> • Untested • Untested, but related research¹⁶ • Partial support¹⁷
Advance information about programs	Information dissemination through media and/or schools	Improves applications and enrollment rates	Moderate support for enrollment effects ¹⁸
Guarantees of eligibility and/or award amounts	<ul style="list-style-type: none"> • Providing guarantees of grants in high schools 	<ul style="list-style-type: none"> • Guarantees of grants to low-income students improves enrollment • Guarantees of grants (coupled with grants equaling tuition) improved persistence • Guarantees of grants/scholarships based on achievement improved enrollment and persistence 	<ul style="list-style-type: none"> • Supported¹⁹ • Partial support²⁰ • Support for enrollment effects,²¹ but uncertain persistence effects²² and unintended negative effects on high school graduation rates²³
Outreach and encouragement to potential students	TRIO Program GEAR UP	Early encouragement programs increase preparation and have sustained enrollment effects	Mixed support ²⁴

Application Processes

While the impact of the application process has seldom been studied, at least in well-designed research, some application processes would need to be altered if guarantees were provided as part of the experiments. Table 4 summarizes the linkages between four types of application features and student outcomes. Whether alterations in the application process would change persistence has not been studied. There has been little prior quality research on any of the following program features:

- *Number of Applications (Single Application and/or Program Specific Applications)*: There are logical reasons to assume that the number of aid applications required is linked to student enrollment and persistence. While there was some simplification in the federal application process resulting from the free federal form, the impact of this innovation has not been systematically examined.
- *Complexity of Applications and Need Analyses*: It is possible that the complexity of need analyses influence applications and, as an indirect consequence, persistence. In theory, complex applications—requiring substantial information for detailed need analyses—could reduce applications and persistence. However, this topic has not been sufficiently studied.
- *Deadlines for Applications*: While students can apply for federal programs up to the time they enroll, eligibility for some state programs and most institutional programs requires advance applications. Anecdotes indicate a relationship (i.e., some students miss application deadlines), but this issue has not been sufficiently studied. For example, failure to reapply on time for state grants can cause an Indiana student to be eliminated from the program.
- *Linkages Between Applications (e.g., use of federal applications by state grant programs)*: Some state and institutional programs run off of federal applications while others require additional applications. The impact of having multiple applications has not been sufficiently studied.

Not only is the current aid application system complex, but early intervention programs that provide aid guarantees must interact with this system. The Washington State Achievers Program and the Indiana Twenty-first Century Scholars Program require students to apply for federal student financial aid as part of their obligation to the grant amount. These types of linkages are appropriate because both programs guarantee to top off aid provided through other programs. Experiments with aid guarantees should learn from these features. If the programs are not administered by state grant agencies, then a new mechanism would need to be established to ensure coordination of aid applications.

Table 4
The Effects of Application Processes on Persistence:
Linkage Structures, Hypothesized Relationships, and Related Evidence

Program Features	Linkage Structures	Hypothesized Relationships	Evidence
Number of applications (single application and/or program specific applications)	Single federal application	Reduction in the number of federal applications increased applications for student aid	No known study of effects; topic could be studied
	Other applications for state and institutional grant aid	Multiple applications reduce applications	Mostly anecdotal evidence used to support claim; more research needed
Complexity of applications and need analyses	Need-analysis formulae require information from families	Complex applications can discourage applications for aid and reduce both enrollment and persistence as a consequence	An understudied issue that merits future study, possibly through experiments
Deadlines for applications	Federal applications can be made at any time before enrollment	Single application increased percentage of students receiving aid, resulting in improvement in enrollment and persistence	An understudied topic A logically sound hypothesis that has not been tested
	Many state and institutional grant programs require advance applications	Deadlines for student aid	Anecdotal support Topic merits study, possibly through experiments
Linkages between applications (e.g., use of federal applications by state grant programs)	Some states and institutions use the free federal application for their grant programs	Use of single application improves chances students will apply for aid, enroll in college, and persist	Indirect support from prior research, ²⁵ but the topic has not been systematically studied

Awards

While student aid packaging has been extensively studied (McPherson & Schapiro, 1997), especially by individual campuses, many of the campus studies have not been published. In addition, the national databases have not provided sufficient information to assess the impact of aid offers. Therefore, conclusions about the impact of aid offers are largely reliant on earlier studies. Table 5 reviews the status of the research. Summative findings include

- *Timing of Federal Pell Award*: If delays in federal budgets cause delays in Pell awards, campuses must make decisions about their aid offers and commitments, especially campuses that make awards months in advance. The consequences of these choices have not been sufficiently studied.
- *Timing of State Awards (and linking to colleges)*: Some states run grant programs much like the federal campus-based programs, allowing some discretion, while others offer aid directly. In addition, the politics of state budgets can influence the award process. Issues related to variability in state awards have not been sufficiently studied.
- *Application & Admission (Advance application v. open enrollment)*: The college application process has an obviously direct relationship with where students apply to go to college as well as with where they attend. NCES (1997a) studies have tended to confuse advance applications with eligibility for college (St. John, 2002), a serious problem and source of misinformation. The relationship between college application and enrollment merits further study.
- *Campus Award Offers*: There is a great deal of evidence to indicate that campus aid offers influence student enrollment decisions. However, this process also merits further study.
- *Private Aid Offers (National Merit, philanthropy, etc.)*: Like public grant aid, private grant aid can influence enrollment and persistence, as indicated by recent research on the Gates Millennium Scholars program (St. John & Chung, in press) and the Washington State Achievers Program (St. John & Hu, 2004).
- *Student Acceptance of Aid Offers*: The role of student decisions to accept or reject different types of loans merits further study.

Early interventions that make aid guarantees also make commitments of funding that have an impact on the award process. At the very least, a process must be established to determine the amount of aid that would be awarded as part of the guaranteed portion of the grant. In the experiments, it would be necessary to have some agency provide the guarantee portion of the grant.

Table 5
The Effects of Award Processes on Persistence:
Linkage Structures, Hypothesized Relationships, and Related Evidence

Program Features	Linkage Structures	Hypothesized Relationships	Evidence
Timing of federal Pell award	Passage of the federal budget	Delays in federal budget could delay Pell awards Campus adaptations could influence return of continuing students and enrollment of new students	Seldom studied Limited evidence from the early 1980s ²⁶
Timing of state awards (and linking to colleges)	Delays in state budgets can delay timing of award information	Delays in awards could negatively influence enrollment and persistence	No known studies
Application and admission (advance application v. open enrollment)	Colleges requiring advance applications often use independent processors Colleges with open admission more likely to use federal application	Advance applications could limit the number of applications, but maximize eligibility Open admission can limit eligibility for programs requiring advance applications Open admissions, coupled with acceptance of late applications, should maximize enrollment opportunity	The impact of advance applications not sufficiently studied; NCES claims it is critical ²⁷ Not sufficiently studied Not sufficiently studied
Campus award offers	Campuses make offers based on their own analyses	Aid offers, along with prestige, influence enrollment decisions	Early research verifies student choice process ²⁸ However, while campuses study these effects, they are seldom published
Private aid offers (National Merit, philanthropy, etc.)	A number of non-profit organizations offer student grants and scholarships	Like other forms of grant aid, private scholarships can influence college choice and persistence	Support from research on Gates Millennium Scholars Program ²⁹ Other published research has been limited
Student acceptance of aid offers	Students can choose to accept or reject colleges based on offers Students can reject portions of offers, such as loans or unsubsidized loans	Aid offers have an influence on the choice of college Student decisions about accepting or rejecting different types of loans could influence persistence.	Substantial support from older studies; recent research has been limited The effects of different types of loans should be studied; the effects of accepting or rejecting different forms of loans should be studied.

Disbursement

The role and influence of the disbursement of government student financial aid has not been sufficiently studied and is not well understood (Table 6). Most government aid is disbursed directly to institutions. Institutions typically pay bills due before making payments to students. However, the basic mechanisms of disbursement and their consequences are not well understood. Key features include

- Government disbursements to institutions: The first two types of information interventions would not change disbursement to institutions. However, if specific guarantees of aid were made, it would be necessary either to provide an additional aid amount to institutions or to make awards directly to students.
- Institutional disbursements to students: The first two types of information interventions would not change institutional disbursements. However, if using the third type of intervention, institutional disbursements to students would need to honor the additional resource commitment, if institutional disbursement was used.
- Disbursements to students: The first two types of interventions would not change this feature, but the third would require direct supplemental awards (similar to GMS) if direct disbursement to students is the preferred method.
- Students' decisions about loans (and changes in decisions about loans): None of the options considered would have a direct influence on loan awards. However, providing additional aid guarantees could reduce reliance on loans in some instances.
- Student decisions about work: *Providing grant guarantees could reduce the work obligation necessary to maintain enrollment.*

Table 6
The Effects of Disbursement Processes on Persistence: Linkage Structures, Hypothesized Relationships and Related Evidence

Program Features	Linkage Structures	Hypothesized Relationships	Evidence
Government disbursements to institutions	<ul style="list-style-type: none"> • Campus-based programs disburse total funding to colleges, which exercise discretion • Pell and many state grant programs have institutions make awards according to schedule • Loans may be allocated to colleges then disbursed to students by campuses 	<ul style="list-style-type: none"> • Campus discretion could increase ability to target high need; also could reduce horizontal equity • Pell is “portable” but amount of award can vary based on where students enroll; actual award amount depends on college disbursement • Improves odds of institutions being paid but could limit student disposable income 	<ul style="list-style-type: none"> • Not sufficiently studied • Still ambiguity over Pell and the role of portable aid³⁰ • Not sufficiently studied
Institution disbursements to students	Typically, campuses pay off bills before disbursing funds to students	Institutional disbursement could result in misunderstanding about student discretion and funding	Not sufficiently studied
Other disbursements to students	Some programs, including many private programs, disburse funds to students who must make payments to institutions	Direct disbursement to student relies on student discretion and fund management	Not sufficiently studied
Student decisions about loans (and changes in decisions about loans)	Students have some discretion to take out more loans if they find it difficult to pay off college costs or to pay other living expenses	Discretionary borrowing, including credit card debt, can place students in financial difficulty; effects on persistence uncertain and undertheorized	Not sufficiently studied
Student decisions about work	Students with financial need after parent contributions and grants must borrow or work to pay for college	<ul style="list-style-type: none"> • In theory, earning improves the chances of paying for college • Working extensive hours could reduce the odds of persistence 	<ul style="list-style-type: none"> • Further research is needed • Further research is needed; descriptive studies indicate working students take more time to graduate³¹

Reconciliation

Reconciliation involves collection of funds due. For students, this process can begin at the end of an academic term (Table 7). If students owe funds, they may not be able to reenroll. The impact of collections from students has not been sufficiently studied. A few specific observations:

- *Bursar Bills for Unpaid Accounts*: The process of collection can limit opportunity to reenroll. Research on this effect is very limited.
- *Repayment of Loans*: Default has been widely studied. Other consequences of debt—the effects on drop out and graduate education choice—have been less extensively studied.
- *Reconciliation—Government Systems and Institutions*: Government agencies maintain audit procedures and options. Loss of eligibility for aid can reduce student choices.
- *Reconciliation—Institutions and Students*: Billing from institutions can limit options for students, but payment seems necessary. This topic merits further study.

There is no reason to expect that financial aid guarantees or changes in early information would require change in the reconciliation process. Therefore, it is not anticipated that early information interventions would influence reconciliation program features, unless an explicit effort was made to simplify or revise these processes. If states or the federal government were to change loan repayment requirements—and provide early information about these alternatives—there could be a need to modify these features of the delivery system.

Table 7
The Effects of Reconciliation Processes on Persistence:
Linkage Structures, Hypothesized Relationships, and Related Evidence

Program Features	Linkage Structures	Hypothesized Relationships	Evidence
Bursar bills for unpaid accounts	Campus bills students for amount remaining after student aid	Failure to pay bursar bills can result in inability to enroll and can induce dropout	Anecdotal support; requires further research
Repayment of loans	Government and/or campus bill for loans	Loan default influenced by work Loans could influence drop out Loans could discourage graduate enrollment	Supported ³² Ambiguous ³³ More research needed
Reconciliation: government systems and institutions	Government agencies audit colleges and can eliminate colleges from programs	Limitations in institutional eligibility can “protect” students These limitations can also reduce student choices	Not sufficiently studied (anecdotal support based on proprietary schools) Not sufficient research
Reconciliation: institutions and students	Institutions have collection options if bills are unpaid	Facing debt to institutions or government can reduced future options	Not sufficiently studied

Conclusions and Implications

This paper examined research evidence pertaining to three questions. As a summary, the questions are reconsidered below.

How can research on the effects of student financial aid, especially persistence research, inform the design of experiments on information for college students? Federal Title IV programs are intended to equalize opportunity for low-income students to enroll in college, including four-year colleges, and to persist in colleges of choice. Research on price response consistently confirms that low-income students are responsive to tuition and student aid, but it is difficult to establish evidence on efficacy, i.e., whether aid is sufficient.

What types of information experiments merit consideration, given the state of knowledge about the effects of student aid? Although there is realistic concern about the adequacy of federal student aid, there is reason to conclude that information about programs might improve access, but there is no evidence that it would influence persistence. However, there is evidence from state programs—the Hope Scholarship Program (Georgia), the Indiana Twenty-first Century Scholars Program (Indiana), and the Washington State Achievers Program (Washington)—that indicates that aid guarantees influence application, enrollment, and persistence. However, Hope Scholarships discouraged academic preparation (i.e., reduced high school graduation rates), while the two need-based programs encourage preparation along with enrollment and persistence. Thus, experiments that include guarantees of aid should be considered. It is possible that these experiments would aid the general understanding of the role of information in promoting access and enabling persistence.

How can research on the student aid delivery system inform the design of information experiments? Experiments that include guarantees of financial aid require substantial modification of preapplication and application processes, as well as modest changes in the disbursement processes. Reconciliation processes are not directly linked to the role of early information.

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Endnotes

¹ Becker (1964) speculated that loans could reduce costs and improve college enrollment. Early studies of the effects of loans on persistence indicated a positive association between loans and long term persistence, but concluded the finding was an artifact of data collection (Astin, 1975). Subsequent research confirms that the loans were associated with enrollment and persistence (St. John, 1989, 1994, 2003).

² A large number of persistence studies have examined the influence of student financial aid packages on persistence. Packages with loans are consistently positively associated with persistence analyses of middle-income and “all” students included in most national populations (St. John, Kirshstein & Noell, 1991; St. John & Starkey, 1995). See also Heller (1997) for review of the effects of need-based student aid on enrollment.

³ Research on the effects of subsidized and unsubsidized loans has been limited. Most research combines different types of loans in persistence studies. The differential effects of subsidized and unsubsidized loans merit further study.

⁴ Time series studies indicate that the amount of need-based grant aid was positively associated with enrollment in the 1990s (McPherson & Schapiro, 1991, 1997; St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004). Cross-sectional studies consistently find need-based grant aid is positively associated with persistence. See Leslie & Brinkman (1988) and St. John (2003) for reviews.

⁵ Many studies have combined merit- and need-based aid, assessing monetary effects. These studies generally find that total grant dollars were positively associated with persistence, especially in the 1970s. In the 1980s and 1990s there was evidence that total grant aid was negatively associated with persistence by low-income students, especially in public colleges (see St. John, 2003, for a review). Somers (1992) found that large merit grants were negatively associated with persistence in an urban university.

⁶ Recent analyses indicate that state funding for non-need grants (i.e., merit grants) during the sophomore year was associated with higher high school drop out rates in the 1990s (St. John, Musoba & Chung, in press; St. John, Chung et al., 2004).

⁷ The studies of the Twenty-first Century Scholars program indicate that students selected for the program were more likely to enroll and persist than other students (Musoba, in press; St. John, Musoba & Simmons 2003).

⁸ The impact of academic integration has remained largely speculative, although a number of studies have examined the impact of work-study on persistence.

⁹ See St. John, Cabrera, Nora & Asker (2000) for a review of early studies.

¹⁰ See St. John (2003) for a review of these studies.

¹¹ See St. John, Cabrera, Nora & Asker (2000). See also Mathus-Grossman & Gooden (2002).

¹² Many two-year colleges had a history of open admissions. In some cases students who had reached adult age and who had not graduated high school were allowed to enroll. However, there has been a national pattern of raising admissions standards in two-year colleges as well as four-year colleges.

¹³ The ability-to-pay studies indicate that students who are concerned about their ability to pay for college (as measured by a response on a Likert scale) are less likely to persist (Cabrera, Nora & Castañeda, 1992, 1993). In addition, the nexus studies have found that

students who choose college because of low tuition were less likely to persist in the late 1980s (St. John, Paulsen & Starkey, 1996). By logical extension, one might argue that concern about ability to pay could be reduced by stability in the aid system, at least if grant aid was at a level that enabled students to pay the costs of attending. However, this proposition has not been tested in an experimental study, so support must be regarded as partial.

¹⁴ As noted above, the evidence from the ability-to-pay and nexus studies indicates that uncertainty could influence perceptions. In addition, the studies of the Twenty-first Century Scholars Program (Musoba, in press; St. John, Musoba et al., 2002) and the Washington State Achievers Program (St. John & Hu, 2004) indicate a positive effect of aid guarantees on enrollment and persistence. These state-level programs essentially stabilize the commitment to grant aid, removing the uncertainty. However, since they are also coupled with a guarantee of aid sufficient to pay for tuition, these studies can be construed as support for the proposition regarding the efficacy of guarantees of aid that is not sufficient to pay costs of attending.

¹⁵ Studies of year-to-year persistence (St. John, 1989; St. John, Kirshstein & Noell, 1991) support the hypothesis; as to the students of Twenty-first Century Scholars, see Musoba, in press; St. John, Musoba, Simmons & Chung, 2002; and St. John, Musoba, Simmons, Chung, Schmit & Peng, in press.

¹⁶ There is related research indicating that changes in aid packages, including increases in the amount of loans or reductions in loans can reduce persistence (St. John, 1989; St. John, Kirshstein & Noell, 1991).

¹⁷ Studies of Indiana's Twenty-first Century Scholars Program (Musoba, in press; St. John, Musoba, Simmons & Chung, 2002; St. John, Musoba, Simmons, Chung, Schmit & Peng, in press) and Washington State Achievers (St. John & Hu, 2004) support the hypothesis.

¹⁸ In a mostly descriptive analysis Hossler, Schmit & Vesper (1999) found that the Indiana Career and Postsecondary Advancement Center (ICPAC) improved access in Indiana. In addition, Hossler & Stage, (1992) and Stage & Hossler (1989, 2000) establish linkages in well-designed empirical studies.

¹⁹ Studies of Indiana's Twenty-first Century Scholars Program (Musoba, in press; St. John, Musoba, Simmons & Chung, 2002; St. John, Musoba, Simmons, Chung, Schmit & Peng, in press) and Washington State Achievers (St. John & Hu, 2004) support the hypothesis.

²⁰ Supported by studies of Twenty-first Century Scholars and Washington State Achievers. In addition, analyses of the effects of state grant programs support the hypothesis (St. John, Chung, Musoba, Simmons, Wooden & Mendez, 2004).

²¹ The studies of Hope Scholarships (see Heller & Marin, 2002) and of state grant programs (St. John, Chung et al., 2004) indicate an association between merit grants and enrollment rates. However, the effects of funding for need-based grants were more substantial (St. John, Chung et al., 2004).

²² Further research is needed on the persistence effects of merit grant aid.

²³ See St. John, Chung et al. (2004) and St. John, Musoba & Chung (in press).

²⁴ In the 1970s, implementation of TRIO, along with early Pell implementation, corresponded chronologically with equalization of enrollment rates for high school

graduates across race/ethnic groups (St. John, 2003). Further research is needed, especially on the persistence effects of these early intervention programs. Funding agents aware of recent studies of TRIO and GEAR Up are not reviewed here.

²⁵ NCES reports claim that students who apply for aid are more likely to enroll and persist (NCES, 1997a, 1997b), but their analysis methods lack any proof of the claim. The example of Indiana's Twenty-first Century Scholars Program is illustrative of the role of application. This program requires students to apply for federal student aid to finish their obligation for the award, and the state applications are run off of the federal application. Analyses indicate a positive effect on enrollment and persistence from the process (St. John, Musoba et al., 2002; St. John, Musoba & Simmons, 2003).

²⁶ This problem has only occasionally happened. There was a delay in the early 1980s. A set of case studies conducted for the U.S. Commission on Civil Rights found that if institutions made awards in spite of uncertainty then negative effects were minimized. The study was never officially released.

²⁷ NCES (1997a, 1997b) used advance application as a criterion for preparation. However, they failed to consider the impact of advance applications or the role of delayed enrollment (St. John, 2002, 2003).

²⁸ The logic used in the early studies (e.g., Jackson, 1978; Manski & Wise, 1983) indicated a sequential decision process. Jackson (1978) interpreted his results to argue that making an offer was crucial. Other research indicated the amount offered was critical (St. John, 1990a, 1990b). However, while campuses often study responses to their aid offers (e.g., Singha, 1997; Somers & St. John, 1993), the results of these analyses are seldom published.

²⁹ St. John and Chung (in press) examine college destinations and persistence, finding the program improved chances of enrolling in four-year colleges and private colleges, as well as had a positive association with persistence.

³⁰ My review of the research on Pell indicates a relationship with enrollments (St. John, 2003). However, others have reached the reverse conclusion (Hansen, 1983; Kane, 1995).

³¹ Mathus-Grossman and Gooden (2002) found working students take more time. They used focus groups, so findings are descriptive rather than confirmatory.

³² See, for example, Flint (1997).

³³ The impact of loans on persistence is situational, depending on level of debt and other considerations (see St. John, 2003).