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ABSTRACT

This proceedings document is comprised of the 12 papers, panel presentations, and work shares presented at a 1997 conference on institutional research. The papers are: (1) "What Does Accountability in Higher Education Mean to You?" (William R. Dyson, Andrew G. De Rocco, John R. Doyle, and Merle W. Harris); (2) "The University of Delaware Longitudinal Study of Academic and Personal Development: Summary of Findings Through Senior Years: Fall 1993 through Spring 1997" (Karen W. Bauer); (3) "New Approaches to the Analysis of Academic Outcomes: Modeling Student Performance at a Community College" (Karl Boughan); (4) "Parental Income and Students' College Choice Process: Research Findings to Guide Recruitment Strategies" (Anne Marie Delaney); (5) "Managing Resistance in the Organizational Change Process" (Melinda Ellis and James Trainer); (6) "Report on Faculty Evaluations at the University of Connecticut, 1993 to 1996" (J. Hughes); (7) "First-Year Student Expectations: Pre- and Post-Orientation" (Denise Krallman); (8) "Remedial Student Outcomes at Massasoit Community College" (Jennifer Luddy and Rhonda Gabovitch); (9) "Assessing Risk: The Dartmouth College Student Risk Behavior Survey" (John H. Pryor); (10) "Trends in Graduation Rates at State Colleges and Universities: Results from the AASCU/Sallie Mae National Retention Project" (Kenneth R. Redd and Joyce A. Scott); (11) "GIS Technology & Geodemographic Analysis at a Small Liberal Arts University: A Home Grown Approach" (Robert Sandev and Jeff Himmelberger); and (12) "The Undergraduate Classroom Experience: Factors Associated with Its Vitality" (J. Fredericks Volkwein and Alberto F. Cabrera). Also included are the conference program and the 1997 membership list. (Some papers contain references.) (DB)

North East Association for Institutional Research

24th Annual Conference

Proceedings

NEAIR

north east association for institutional research

Accountability and Institutional Research: Measuring Results

Sheraton Hotel • Hartford, Connecticut
November 1-4, 1997

Dear Friends and Colleagues,

Here, once again, are the Proceedings for the Annual Conference of the Northeast Association for Institutional Research. These pages include a rich array of papers and presentations. We trust that their presence on your bookshelves will enhance your professional life. Congratulations to Karl Boughan winner of this year's Best Paper Award.

Thanks to all of you for creating another marvelous Northeast Association for Institutional Research conference. The wonderful program and the Hartford, Connecticut site attracted 176 attendees to our 24th Annual Conference. Those involved in the hard work of organizing the conference were delighted to see each and every one of you!

Particular thanks are due to Denise Krallman (Program Chair) for provoking such a great selection of presentations and such a stimulating opening session. People were talking about the issues and topics raised in that session for the rest of the conference, exactly as Denise had intended!

Hearty thanks also to Bob Yanckello (Local Arrangements Chair) and his hardy and hard working band of Connecticut IR colleagues. The eating, sleeping, presenting, listening, networking and entertainment arrangements were superb.

Brenda Bretz, our extraordinary Membership Secretary, faced crashing hard drives and lack of labels with creativity and equanimity and once again, led the president, program and local arrangements chairs through their responsibilities with sage advice and good humor. We could not have done it without you, Brenda.

Thanks to all members of the 1996/97 Steering Committee for their help with so many aspects of the conference and Association business throughout the year.

My thanks to Publications Chair, Corby Coperthwaite, for her excellent work in publishing these Proceedings so that those of you who were unable to attend can take advantage of the knowledge and experiences of colleagues and those of us who were there can crib from colleagues without having to find those scribbled notes!

And last, but not least, thanks are due to all of you who presented papers, conducted workshops, staffed the registration tables, took groups to dinner and together, made our 24th Conference memorable and satisfying for all those attending.

Best wishes for 1998. See you in Philadelphia for our 25th Anniversary!

Jennifer Brown
President, NEAIR 1996-97

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TABLE OF CONTENTS

I. Papers, Selected Panel Presentations and Work Shares

*****Karl Boughan's paper was selected for the Best Paper Award**

What Does Accountability in Higher Education Mean to You?[1]

North East Association for Institutional Research 24th Annual Conference
Opening Plenary Session, November 2, 1997

Panel Discussion with the following participants:
The Honorable William R. Dyson, Connecticut State Representative
Dr. Andrew G. De Rocco, Connecticut Commissioner of Higher Education
Mr. John A. Doyle, Member of the Board of Trustees, Connecticut State University
Dr. Merle W. Harris, President, Charter Oak State College

Michael F. Middaugh, Moderator

The notion of what accountability really means I think is one of the most important questions that we have to deal with in our professional lifetime, at least over the next several years. Those of you who know me know that for the past three years, I've been involved in two projects. Denise [Krallman] alluded to one, the National Study of Instructional Cost and Productivity, which is a FIPSE funded project, that looks at the issue of faculty workload and tries to relate it in some sensible way to instructional cost and productivity. I've also done some work with the Joint Commission on Accountability Reporting - I've spent the last year as director of their national pilot study on faculty activity reporting. These two projects have taken me far and wide. I've been in Hilo, Hawaii, in the past twelve months, in Starkville, Mississippi, and this good state in Winsted, Connecticut, and as far north as Lansing, Michigan. And I can tell you two things: the first and foremost thing is that it makes me awfully glad to come home to Northeast AIR which I still think is the best regional association in the country. But also, it has been made very clear to me how puzzled, how angry folks out in the trenches are at

[1] Transcribed by Jane Le, junior in Management Information Systems, with the assistance of Barbara Nangle, graduate student in Sociology, University of Connecticut.

higher education institutions on this whole issue of accountability. We have, to some degree, been somewhat arrogant, somewhat aloof in terms of not being accountable to our parents, to our taxpayers, to our legislators. And I think the time has come for us to, in fact, enter into dialogue and discussion on this whole issue of accountability.

In that light, I think that Denise and Jennifer [Brown] and others involved in this program have put together a very, very strong panel. We are going to hear this afternoon from four individuals.

We are going to hear from Representative Bill Dyson, who just joined us, who is the House Chair of the Appropriations Committee in the state of Connecticut. There is no individual in any of our states that's more important to us than the Chair of the Appropriations Committee. And I think that the whole notion of accountability is important to Representative Dyson. We'll need to hear his perspective on it. We will go from there to hear from Andrew G. De Rocco, who is the Commissioner of Higher Education in the state of Connecticut. Again, the commissioner of the state governing board is an important and key player in this dialogue on the whole notion of accountability. John Doyle is on the panel. John is a member of the Board of Trustees of Connecticut State University. Each of us is responsible to our own board of trustees and in that light the board is very, very critical. And, of course, each of us has to go home back to our home institution and answer to our president. And we have Merle Harris who is the President of Charter Oak College here in Connecticut. She will give her perspective on what accountability means. So without further ado, let me turn the microphone over to Representative Dyson. We will hear from each of our panelists in a serial fashion and then we will throw the floor open to questions. One very important

thing that you need to know [is that] this session is being taped. If you ask a question, I'm going to ask you to please step up to the microphone so that your question is in fact communicated to the tape recorder back here. And without any further ado . . .

The Honorable William R, Dyson, Connecticut State Representative

I have thought about how I would initiate this discussion, which is what I hope it will be: a discussion about accountability and what it means to me. Now, I put a lot of emphasis on "to me," and I think I need to put it in context for you. I chair the [Connecticut legislature's] Appropriations Committee. Now if one has any notions that you have total control, forget it! The Committee consists of approximately 52 members, who each consider themselves to be strident individuals. So that is the environment in which I have to operate. But in addition to the composition of the Committee, and it crosses a broad spectrum from those who consider themselves conservatives to liberals to moderates to men to women, black, white, big-city, small city, and all that. All of those dynamics enter in and then you take and put on top of that what interest they have. And after you include their interest, in addition to all those things I've mentioned, then you have to consider those things that influence them: the town that they're from and the mayor; if they've served on the board of ed, and that board of ed; if they have a child in school and what that means to them; if they have a friend and how all of that impacts; whether or not they're conservative in terms of spending; and whether or not they think any more money ought to go into higher ed. And you match that off against all the other things. And now we have what we call this element of reality beginning to creep in.

Now there may have been many who have held a view (and I've held it for a while, still do, but not as much as before), that there's something noble about education - they ought to get everything they asked for. Well, in the environment that I operate in (they call it political environment) very often that doesn't work anymore. It might have worked at one point, but it doesn't work anymore. Let me give you all the reasons why it doesn't work anymore. Everybody that is deemed to be part of higher ed earns a pretty good salary. Whether [that's true] or not, that's the perception. And then, when you look around at all the problems that confront our society as a whole, one thing you come away [with] crystal clear: we need something to deal with the problems we have out there and somebody is failing us, somewhere. And the money that we provided hasn't solved the problem. And we feel that somehow we've provided a pretty good chunk of money. A great degree of independence. Noble purpose, no questions asked for higher ed. And what [have] we got in return for it, what is there? And then you take and put that question in the environment that I've just described, [include] all those things that influence [the committee members] and all the other realities that they are confronted with. And then you establish a pecking order.

What comes first? Higher ed? Nursing homes? Primary and secondary ed? Environmental protection? Health care? Day Care? Salaries? Debt service? Highway? Public transportation? Which ones come first? Higher ed should be first. Well, maybe not. Should it be senior citizen's day care? Should it be health care? Children? Should it be primary and secondary ed? And take all of those issues, prioritize, and then flavor it with a limited amount of dollars. Limited amount of dollars and then dump on top of it folks having it up to here with the issue of taxes. Okay, now what do we do? Now what

do we do? So now you come back to that question: Is [higher ed accountable]? What does it mean to me? Well, let me give you some of what it means to me.

I am in education . . .teach school. . .know about that noble calling. But I also know about those things that you used to talk about on the railroad called feather bedding. And I figure when I was coming down the road, I said "You know, I'm gonna rattle somebody's cage. And I'm gonna say some things that's gonna set them on fire." And they want to get right on my case after I said we have feather bedding. Now, one would assume, that being the noble calling that higher ed is, I know what higher ed *does*. Well, not really. Not really. When I say not really, no one engages in *really* talking to me about *what it is they do* and *why* I should be about the business of providing them with some additional money. And I don't want to raise that question here now, but how many have gotten a legislator, and taken them to where you are, showed them what you do, and the importance of what's about to take place, to justify anything else you should have. Probably not. Because you probably feel that as noble callings, everybody ought to know that, so I don't have to show anybody anything. Well, you're mistaken. You're mistaken because I'm the one that's got to press the button on the tax increase. I'm not going to put my rear end on the line for you when I'm not sure about what it is you do. And you don't feel that you ought to be about the business of letting me know what it is that you do. You don't show me the connection between the decision I should make and the benefits that ought to be derived from it because somehow we've got this gulf.

Yes, I am in education and I understand much of that, but then there are a lot of people there that I have to deal with on that 52 member committee that aren't there. And I've got to bring them along for what I feel and what I think ought to be, and what you're

entitled to, and what it is we ought to be doing. I've got to bring them along, but how do I bring them along when they may be interested in their grandmother who's in a nursing home and who's 90. Well, you aren't going to snatch anything from their grandmother. Not about to do it. And what do you do with somebody who thinks they have 50 people living in their district who work for the state who are not getting the benefits that they feel they deserve that other people are getting that they are working for and paying for? Now, I've got to kind of match off those needs and prioritize those interests and I've got to do it in the environment of limited resources. And then I've got to deal with some traditional things about the "nobleness of higher ed" and why I ought to provide some more. And it just doesn't settle folks the way it used to. Not anymore, not for me, because I can't. I can't because of all the other things I've just identified that I have to deal with. And now it gets compounded by some other realities that we have to deal with here, and [where] many states find themselves.

Let me give you an example here now. Everybody who gets this mortgage, you don't question every month [if] you're going to make the mortgage payments. That's a legal document; you signed on the line. You expected to do it; you don't do it, you lose it. Plain and simple. Well, we have the same problem. We borrow money to build things and do things and go to Wall Street and get it. We've got to pay it back. [There are] no ifs, ands, or buts about it. We've got to pay it because if we don't our credit rating is in a jam. So we're going to pay them. Every time we go out and do something like we do with roads and buildings and all those things that we do (major projects) and they're bonded, we borrow. And we've got to pay the debt service, and then we toy with this notion that maybe we ought not to increase taxes, maybe we ought to [have] a tight

cut back and everybody is doing it because, it's a popular thing to do. Guess what's going to get paid? That's right, the mortgage. The debt service. Guess what's going to get zapped? Yeah, that's right, higher ed.

And then there's other soft things around, then you begin to wonder, how did that happen. Simple. You didn't see it at the time that it happened and you made a demand for it and thought you deserved it and needed to have it. Because we're concerned about that quality of life issue. Quality of life, you know, good roads, good streets, good schools, da da . . .and somebody got the notion that you can get it for nothing. No, you don't. So, because of the pressure that comes to bear on all of the other things that we do, now you begin to raise questions about those things we've taken for granted. All that time and in the midst of that comes higher ed so we can begin to ask tough questions. Why should I give you more money?

Now let me give you a case important right here in this state you may not be familiar with. We just last year got through cutting the heck out of mothers and kids. Sure did. Didn't provide what we thought they needed for day care. "Go get yourself a job and get off your butt because you've been lazy." We throw that stuff around, traditional stuff, you know, because they're there, lazy, they don't do work, do da da da . . [We] never bother with the notion that they may need some training to do it. [We] never even raised the question that there may not be a job to do it. Yet we talk this year about building a football stadium. Now you can tell how that sits in my craw. Big time. Just don't do that. But you know what? I think there's a sizeable amount of people who are prepared to make that decision and do that very thing. And make it happen. Now the question becomes, are these good priorities? Some folk would say building a stadium

creates jobs and all that kind of stuff. Yeah, when? For how long? How many times a year would you use a stadium? And because there are people who want to do that and do it in a big kind of way, the kind of questions that need to be asked will not be asked, and as a result, we belly up to the bar by virtue of being forced into it - providing the resources to make that possible. At the same time, we are going to take it from something. So, in order to pay for the stadium, we are going to take it from something soft, and something soft will invariably be, huh, you got it, higher ed, environmental protection or ...those things that haven't followed answering to the accountability that's so important in making decisions regarding the limited amount of resources that a state has. I'll leave it for now because I have a lot of other things I could say, and I'll do that later on. Thank you.

Michael F. Middaugh, Moderator

Thank you, Representative Dyson. I suspect you'll get one or two questions or comments at the end. We go from the legislature to the state board.

Andrew G. De Rocco, Connecticut Commissioner of Higher Education

This isn't the only time I followed Representative Dyson to the microphone. It's always the same. I heard a joke the other day actually which, if we change it a little bit, is kind of applicable. I was entertaining a group of German delegates on the Lantag in Baden- Württemberg with whom Connecticut has a sister state relationship. And the council general came down to give some remarks when we were at Yale, and he told the story about three people that had been sentenced for execution. One of them was a Frenchman. The second one was a German. And the third was a Brit. And the

executioner turned to them and said, "I'm gonna grant you one last wish." He says to the Frenchman, "What's your last wish?" He said, "A bottle of wine." He turns to the German and says, "What's your last wish?" He said, "I want to give a speech." He turns to the third one, the Brit, and said," What do you want?" He said, " I want to be shot before he gives his speech." You're a hard act to follow, my friend, but an admirable one.

I want to take a few minutes to try to put Representative Dyson's views about the issue of accountability into perspective. That is, on the one hand, connected to the work that you do, I'm sure you do, but at the same time to try to put it in a policy context. Because it seems to me that the ultimate reality of any effective instrument of accountability is to insure that those things being assessed are somehow or other in keeping with the larger issue, certainly in the public sector, of what constitutes appropriate public policy. At the root of Representative Dyson's observations were questions of public policy. And public policies are debates that need to bring all the appropriate stakeholders to the table.

So let me say a word or two about what I think the issue is from my point of view and from my board's point of view. We point out that the Board of Governors for Higher Education and its commissioner is the only non-executive cabinet office in the state. I report to an eleven-person board, seven of whom are appointed by the governor, four of whom are appointed by the two chambers of the legislature from the two parties. The appointment terms are so staggered that no one can pack the [board] in any given legislature session or term. The board is statutorily independent. It has the responsibility for being the policy board for the state. It oversees issues that are rather more mundane

such as life insurance accreditation, both in independent and public sectors, and veteran's approval. It does state service, administers the Commission on National Community Service, which Representative Dyson chairs. It does all sorts of analyses on budgets and facilities' needs. It does policy planning and policy studies, and from the point of view of its operating arm, which is the Department of Higher Education, it seems to me that the first issue in accountability is the issue of definition. That is to say, if there is to be a system of public higher education with its collateral and important components in the independent sector, then the components need an identity and they need a function.

Now, how to do that. A system is not a system when four units of the state's higher education community are all competing for the same students on the same turf with the same programs for the same dollars. That's not a state system. Now, perhaps in an economy of unlimited resources, you could let the market decide. That's not the condition we find ourselves in. And for that reason, if no other, it makes sense to engage significant partners in the enterprise into a conversation about why that public system ought to exist at all. You don't have to take it for granted. Should there be a public system? And if so, what should it be doing? And then how would you configure it to get that job done? Once you've begun to think about those questions, then you can begin to think about those things both qualitative and quantitative that characterize the outcomes that are consistent with the agreed upon virtue of this piece of the state's public policy.

Now, as far as my agency is concerned, we do have an instrument for that purpose and are currently engaged in making the most effective use of it that we can. It has to do with what are called mission, role, and scope statements. You certainly must have their analogs in your own systems. Each institution within the [components in Connecticut has

them]: the University of Connecticut, the land grant, sea grant institution, the Morrill Act grant institution in the state; the four campuses of the state university system (whose trustee member is here with us today), the original normal schools that became colleges and are now confederated as a university system; twelve campuses of a comprehensive two year system, community technical colleges; and then Charter Oak State College, which functions (for those of you who are familiar with other states) as Empire State does in New York, and [as] corresponding non-organized systems without their own campus, without their own institutional core structures do. And I am certain that Merle Harris, President Harris, will speak to her function and the relationship that she has to her own issue of accountability.

But if you can then begin to seriously identify what the mission of each of these components is, and then you begin to identify what role their various institutions have and how large the range of activities is going to be, say the scope, then you begin to ask yourself such questions as, "Where is it in the interest of public policy for the University of Connecticut to elaborate its satellite campuses from two- to four-year institutions granting undergraduate and, in some instances, graduate degrees at sites far afield from Storrs when the service region corresponds to the service regions of other institutions in the state." (Similarly to Representative Dyson's good will when it comes to their budget). Those issues have to be resolved *fundamentally* before the question of accountability at the statutory level, at the administrative level, and at the institutional level, can reasonably be answered. We are engaged in that very activity. There will be a meeting of the presidents of the system on Thursday of next week with their board chairs

-something known loosely as the Coordinating Council - at which I will present my board's current proposal to do as broadly based a policy study as the state has yet seen.

Now once the mission, role, and scope statements have cleared, then it seems to me that what one needs to do thereafter is to consider the consequences of the engagement. If one begins at some point, what is it that one expects in the spread of end results that constitute the outcomes that are consistent with the definition. What you would expect at a two-year institution that has open admission? There must be some, to use the jargon of the day, "value added." You don't expect someone coming out with an associate's degree to be at the same point as someone who is admitted and winds up with a full baccalaureate at another institution. But there ought to be, if you will, deliverables. There ought to some understanding on the part of the institution that if I let you in, these are the elements of accomplishments, attributes, attitudes, and subject matter content that you have a capacity to deal with when we say it's over. Until you define something that reasonably can be accounted for as a measurable outcome, qualitatively as well as quantitatively, then it's unclear.

Let me give you another illustration of what I mean by "value added." One of my colleagues from a university not represented here, out in Storrs, after I made a public utterance that he wasn't comfortable with, he said, "Oh, that's just an act of mindless bureaucracy." In the days before I was a mindless bureaucrat, I was an honest practicing physicist at several universities. And in the process of being transformed from an academic physicist into a college dean and eventually president, I spent some time at Harvard and I got to know Henry Rosovski [Dean of Faculty of Arts and Sciences in mid-1970's to mid-1980's] fairly well. And I was trying to mimic his behavior as a faculty

dean when I got my own first faculty deanship. But I remember at the faculty club, one lunch, Henry came in looking a little glum and preoccupied. And I asked him what he was up to. He was preparing his notes for that evening's Phi Beta Kappa chapter introduction, and he said that he was trying to figure out what to say. And I said, "Henry, how many people are in the class?" And he said, "Oh, 53, 54, something like that." And I said, "Oh my gosh, Henry, you must be disappointed." "What do you mean disappointed?" he said. I said, "that there's only 53 kids that are going to make Phi Beta." He said, " What are you talking about, that's a huge class." I said, "Henry, four years ago, you admitted 1,340 people, every single one of whom was potential Phi Beta. How did you fail the rest?"

When you ask yourself the question of "what is it that Harvard College does with its undergraduates?" You must ask "what is it as an outcome that actually certifies that that experience did not simply take in very capable people and leave them alone?" You know the subliminal joke about all of this is: the reason Harvard is such a great place is the students bring so much with them and take so little away. The question is what do they take away? What Representative Dyson wants to know and what I want to know, and what my board wants to know, is *what have you really done*? And that issue transcends simply its effect upon students because in an institution, the culture of the institution defines the set of responsibilities that everyone has - students, faculty, and others alike. There have to be some recognizable outcomes other than face time in the classroom that constitute the subject of the fundamental material out of which a faculty career is made. So the issue of accountability has as much to do with *qualitative* changes

in the attitudes and performance of *faculty* members and *administrators* as it does in those measurables associated with students.

Well, how do we get to this? I have one caveat actually, and that is the one thing that I'm concerned about in accountability: that in an effort to demonstrate that something has happened, you allow yourself to be trapped into believing that because it's measurable, it's meaningful. The great curse of the social sciences is what I call physics envy. More sociologists throw away useful information because they can't quantify it. You know some things are true. You understand some things are interesting. And if all you can do is to describe it, to make sense out of the description, that kind of argument is as valid before a commissioner or a legislature as numbers which are hard to understand. You can poke holes through it because all you've done is to collect what you could collect without understanding why you were collecting it, what it means. The point made earlier by our moderator is that he was attempting in his study to make reasonable connections between issues connected to faculty workload and justifiable measures of outcome that reflect productivity. That's a very tough equation to make. But if it isn't made, the numbers are worthless.

So let me in conclusion then say a few words about what my board is going to do. In our retreat this summer, I presented to my board what I wanted it to consider as an agenda for its near term activity. And much to my delight and somewhat to my surprise, they agreed. There are five components to this policy discussion which I believe are fundamental for any effort at accountability. The five planks of this platform are the following. The first is labeled, not surprisingly, accountability and performance. But the question that goes with it is " What is known or can be learned about the effectiveness of

institutional performance?" I ask it more as a research question than anything else, but it must be asked. The second one has to do with the issues of access and affordability. Access has two pieces to it: one are the physical structures there and is there an opportunity for those interested to get in and make use of them; and secondly, how can you do this in a way that makes it affordable? Colleges and universities are largely industrial organizations. They function largely in an industrial mode of mind. But people talk about the cost of higher education. That's not what they mean. They really mean the *price* of higher education. Its not cost that scares them; it's the sticker shock that scares them. Now what drives the price? The price is driven by the cost centers. The cost centers have been the same for hundreds of years. They are definitions of institutional performance based on departments, on tenure, on contractual arrangements that have risen far faster than the CPI. And which some legislators are perfectly willing to approve because it's in their political interest to give the faculty a raise and look good. And then [they] turn around and don't appropriate what's required, and then the burden has to fall on the students and hence tuition. What's driving the price are those cost centers within the institution over which no one has given very much intelligent or rational thought. To reconfigure the price, you have to reconfigure the cost centers.

Now there's another partner in this exercise. The third of the board's positions has to do with education and employment, subtitled "the economic equation." What is the relationship between competencies learned in the university and college settings and the likelihood of creating an economic contract with the state that makes a state such as ours, which is a high cost state, possible and livable? Now in saying that, you will understand that I don't for an instant intend to sacrifice the development of what is in the

long run infinitely more interesting and important, and that is social capital. The creation of a citizenry prepared and interested in its own community, capable of giving its own competencies back to that community, is in the long run, the single most useful thing an educational system can do. And I am also making a distinction now between employment and employability. To have a job is not half as interesting as to be employable in a day and age when industrial transformation, the transformation of industrial economy into a knowledge base economy, is occurring. It's not what you knew when you walked in but your willingness to stay up to speed that makes all the difference in the world. And staying up to speed after you have a degree or two means getting access on your terms, on your time, in your place. Now that's a market, and if higher education doesn't realize that that's a market, private providers who do will take it away from you. If you can't figure out how to make distance learning integral to the way in which you deliver to an adult population constantly and consistently the things it needs to know to remain employable, you will have missed the point. It truly is a commencement, but it needs to be more than a rhetorical commencement, if as institutions, you are going to be accountable to the society that is continuing to put the money on the table to keep you there.

That leads me to the fourth point, which is technology. It not only is a question of doing what you've done before more efficiently, it's the question of radical potential for educational reform that lies with the technology. The pedagogy can change. The epistemology can change. The whole structure and delivery system can change. And those who embrace it will prosper, those who accept it will briefly survive, and those who reject it will perish. Finally, the last point I would make is that in their kind of

environment, higher education institutions need to look not only out into the workforce forever but they need to look back into K-12. The connection between higher education and K-12 is now more important than it's ever been before - not only for the issue of whether they come to you adequately prepared to do what you now are going to define as your mission and make it happen. . . But because colleges and universities are the source of most of the teacher training that occurs in this country. And until that transformation you are responsible for ensuring that value systems and competencies in the next generation are capable of transforming K-12 as much as you yourselves need to be transformed. And you have to begin to talk to and listen to master teachers in the classroom. I would rather sit over dinner with five master teachers than five professors of education. You know why? Because they're people in the classroom who understand development. They understand transformation. They understand kids' problems. They know what learning is about. They don't sit back and invent things like whole language out of some kind of illusion that it's actually going to work. So the connections need to be operational connections.

Now, the last point I want to make: how to do this? Well, my board has agreed that the way it's going to do it is to ensure that it develops an advisory council that works *with* the board in helping to shape this conversation. This means that the stakeholders of consequence will be members of that advisory council. Those stakeholders include almost anyone you can imagine: from the business community, from the legislative community, from the community of scholars themselves, from the institutional representatives, from those who are the clients of the system and the eventual users of its outcome. A conversation of this kind would work well if and only if the institutions

understand that it isn't merely a commissioner or a legislator that's suggesting they need to change, but that everybody out there who has a stake in the outcome looks them straight in the face and says, "Shape up guys! We need you, you need us. This has to be a contract between us. And once we cut the contract we'll find out when it's time to pay."

Michael F. Middaugh, Moderator

Thank you, Commissioner De Rocco. We now have a sense of what the legislature and what the state board are looking for in the way of accountability. I think the trustees have the special charge of trying to interpret what the *constituents* that we empowered to serve are after in the way of accountability. And John Doyle, it's your task to convey that to us. Please.

John A. Doyle, Member of the Board of Trustees, Connecticut State University

Thank you, Mike. Ladies and gentlemen, Mr. Chairman, Commissioner, President Merle, and my good friend Jennifer, who has I can tell you mightily resisted the attempts of at least one trustee to engage in inductive rather than deductive reasoning. And for that I thank you and admire you, Jennifer. I can't resist departing a bit from the topic that you gave me, and I will be brief responding to something that Representative Dyson said.

In a former life, I assisted a United States Senator who was then chair of the labor HHS appropriation sub-committee, which some of you know has something to do with student aid, biomedical research, and a number of other things that are very important to

the higher education community. The year was 1985 and the scourge of AIDS was just then becoming apparent to the Washington community, or at least to parts of it. And there was resistance on the parts of folks who are more conservative to find monies to put into biomedical research addressing the AIDS epidemic. The man I worked for, and a sufficient number of his colleagues, decided that the little that was offered wasn't enough. Hearings were held and as sometimes happens, the staff was left to figure out what [was] the appropriate amount of money to put forth and in what fashion.

My point is this. I called in some people who will remain nameless because I'm sure you [would] know them if I mentioned their names. I said, "How much money should we put in this line? Hundred million? Two hundred million? Three hundred million?" I was assisted in my work by a man some of you know now passed away a year or so ago, Dr. Steve Bongard, who was formerly with the University of Connecticut Health Center, was a member of my staff. [I] couldn't get an answer (think of what was hanging in the balance), couldn't get an answer. The men and women from academe that I talked to said, "Well we don't, you know, . . .um. . . um. . .I don't know. We need money." I said, "Well, how much can the system absorb without embarrassing us? So that a year from now biomedical research isn't undercut by the people that would like to zero it out?" [They said,] "Oh well in politics... I don't, I'm not involved in politics." Well, I think the point that Bill made is clear and the point that I'm trying to reinforce is that if you really care about all this stuff, even if you're not a publicly funded institution, you'll involve yourself in the public policy deliberations that come along. It's an extra job. It's outside your ken. It is what a democracy is all about. And that AIDS story is exactly true as I told it. I mean, I hate to think what would have happened had there not

been a chairman of sufficient stature to insist that resources be put forward. And at least one person was stupid enough to just put the money up and hope for the best.

In my case, I have a task here today, and after hearing the commissioner, I [think] that we have [prepared] our remarks [regarding] some of the same [issues]. Accountability, well, *for what* and *to who* immediately come to mind to a trustee. The quality issues. We want to provide in the Connecticut State University system a quality liberal arts education. We want our students to be able, if that indication indicates, to taste the fours years of their attendance, hopefully four years of their attendance at our institutions. We want to expose them to literature, the arts, history, sciences. We want to provide so that those students who come into the Connecticut workforce are prepared to engage and to advance that workforce in the economy of our state; justifying the economic contribution our state has made to their education. We as trustees have to look at how our resources are allocated and how we're managing them.

The money that Chairman Dyson and his committee, the legislature, provides goes some place. Who's managing it? And how well is it being managed? The mundane sort of ordinary "liddy giddy" things, [but if they] appear in our Hartford Courant, can cause him and his colleagues heartburn: deny resources to the university. And we have to look at issues of student life, we trustees. We are after all for many a residential institution, a place where young people live. What's the quality of that life? More importantly, what's the quality of what our students are learning in that life? Are they learning cultural diversity? Or are they learning isolation? What about the current scourges that I see that you're dealing with here? Suicide, drinking, tragedies that occurred just north of here [at the] beginning of the year. None of those is mutually

exclusive, of course. Every trustee, I would wager, in any of our state institutions or private colleges and universities here in Connecticut, must attend to those, in his or her part time role.

But I was asked what accountability means to me. Accountability for the Connecticut State University system, which I'm privileged to be able to serve, requires a look at public policy. We are after all a public university system. We're the largest public four-year degree granting institution in the state. And an assessment of the stated and implicit public policies that cause literally hundreds of millions of dollars to be committed each year to CSU: it's my responsibility. You want to know what I'm accountable for? What did the state have in mind when it established those four institutions, provided the operating support (which is always very visible and contested, the chairman can tell you) [and], not so visible but just as significant, the capital support, which allows many fine structures on many fine campuses; the two-year, the four-year schools; the University of Connecticut; and hopefully a home for Charter Oak, too, Merle, I think is coming soon. By anybody's standards, ladies and gentlemen, a very substantial investment.

And as I look and try to discern what that policy might be, I come to the conclusion that we are not a state where we have a capacity problem in higher education. Our private institutions could, and I believe would, surely respond to additional demands for more students coming through their doors. I believe that the quality of instruction at our state's private colleges and universities is very good, to excellent, to world class. Indeed, [they are] able to accommodate virtually any student's interest. Well then why in God's name does [the state] put up hundreds of millions of dollars a year? Does Andy

[De Rocco] wrestle with policy issues? And why do we have a system with what 21, 22 institutions at well over two dozen sites around a relatively small state with an average size population? My answer to that is the public university system is here for one reason: access, to provide, to assure that people who have the ability and the interest to pursue higher education get the opportunity to do it. And it might not surprise you that I'm an alumnus of the system who was given that opportunity. And ladies and gentlemen, as I'm fond to say, the world might well not have been a poorer place had I not gotten a baccalaureate degree, but I sure as hell would have. And I think our job in terms of accountability is how well we follow through on access. I might add that the legislature in this state, as in several others, has insisted that the state university system (and I believe the University of Connecticut as well) have a substantial number of alumni on their board of trustees. I think that's good. Clearly, myopia is a danger.

On the other hand, I think that people who have benefited from the system have one, a responsibility to contribute to its furtherance, and secondly, I think its mission need not get lost quite as quickly if there are alumni involved. Access means a lot of things. Immediately coming to mind is economic access. Was that a situation for me? You bet, sure was! National Student Defense loans, student grants, EOG grants, and a wonderful woman named Mrs. Balchunis in Dr. Bill Chatfield's student aid office are the reasons I got a degree. Now why do I say all that? Is that just sort of a happy reminiscence? Yeah, it is, but it's one of the things I like to look at as a trustee. How well is our student aid office performing? When I see a woman from Long Island [complain about] what [it] was like to get a simple answer as to what student aid would be for her son that next semester, it makes me livid! Access is the reason, in my view, we

have a public system of higher education now in Connecticut. We do not need the four-year colleges to train teachers. We do not need the University of Connecticut to engage in biomedical research. Those tasks would be undertaken in this state by other universities. What we need is to make sure that [access is for] people of limited economic means, and I would argue, different cultural attitudes, people who have never thought of higher education as a real option in their lives, whose families may be immigrants or first generation. It's our role to take the higher education opportunity to those communities where those people are, and to see those folks enrolling in our public institutions in percentages that at *least* equate to their percentage of the Connecticut population as a whole.

We have not succeeded in that mission yet. I say to you that a number of our institutions and it's not just my alma mater, engaged in international activities. We have branches in China, Poland, Middle East, probably a good number of places that I'm not aware of, [the] Caribbean (I'd like to go down and visit that one). I would much rather that our campus, and have said so, that our campus presidents have a sandwich board over them in New Haven, or Bridgeport, or Meriden, acquainting youngsters in those communities with the opportunities that the Connecticut public systems of higher education offer, than in toasting with some potentate [his] interest in enhancing our university stature or in the dubious proposition of [his] making some money for us that we wouldn't otherwise receive.

So in the public sector, ladies and gentlemen, I suggest to you, that for me at least, access is the reason I serve the board. I'd like to see it enhanced, I'd like to see it preserved, and I guess most importantly, I'd like to say thank you for it having been there

when I needed it. I can't resist the opportunity and I have about two minutes, then I'll quit. And now that I've tried to answer the question that was posed for me (maybe not well), [I'd like] to ask you to help us trustees. You're probably in the best position, from what I can see, to be able to discipline the flow of information that we receive, to regularize it.

You know there's a story that some of you might have heard about. A guy was pulled over in a car, speeding. The cop came up and said, "Sir, you realize you're going 75 mph?" He said, "No, I wasn't. I was going 60 mph, I never went a drop over 60." The cop turned to the guy's wife and said, "How fast was he going, ma'am?" And she said, "He was going 75, officer." Well, at this the fella just scowled. The cop then looks at him and said, "Say, you don't have your seatbelt on." The guy said, "Well, gee, I had it on, I just went to get my registration in the glove compartment, [and] didn't get a chance to put it back on." Again the cop looks at the man's wife and said, "Gee, did he have a seatbelt on?" She said, "No, he didn't, officer." Why at this the man goes into an absolute tirade. The cop has to kind of hold him down. The cop said, "Geesh, you act like this often?" The woman said, "No officer, only when he's been drinking."

There are times when you get too much information, ladies and gentlemen. Too much information. And I would ask you that the role you play I think can assist your presidents, your academic officers, whomever you work with as you interact with trustees. You can bring discipline and a regularity to information we receive. I can tell you that I can give you a chart of when we're going to get certain financial information in order that it be prepared for the legislature for the governor's review, for the important matters of student fees, tuition setting and all that. That's regularized right by the book.

If I asked about the same information and regularity of it, about access, about academic affairs (a committee I chair), we find it gets to be much more ad hoc. What's the agenda we have to deal with this month? What's the information that's needed to support that agenda? That's what we receive. I would ask you to take a look at whether or not you're giving unwashed men and women like myself, who come to meetings on an irregular basis, such a plethora of apparently disjointed information that it's difficult for us to address the accountability question. As I say, when it [comes] to finance, it gets pretty disciplined. When it [comes] to other facets of the university's life, I find I'm like the [police officer] that got too much information. I'll quit and I thank you very much.

Michael F. Middaugh, Moderator

Thank you very much, Mr. Doyle. The concept of accountability has got to be near and dear to the heart of a college president. A president of a state institution has to be accountable to the state legislature in terms of demonstrating that their institution merits the state appropriation, has to wrestle with the state board for their fair share of the appropriation, has to demonstrate to the board of trustees that he or she is a good steward of those fiscal and personnel resources. And well, ... President Harris, I'm eager to hear what your sense of accountability is.

Dr. Merle W. Harris, President, Charter Oak State College

Thank you. Being last on this panel is mind-blowing. I knew it was going to be difficult when I saw who else was going to be on the panel. Each has presented a very, very important example of accountability. But what it all boils down to is that it does stop here for sure. And guess what? It stops with you as well. Because if the president is the one where the bucks stop, the president turns to the institutional research people to

help put that story and that information together and actually plan for how to collect the data and make the case. So what we're going to talk about in a very few minutes, it sort of reminds me of Elizabeth Taylor, what she had said to her husband, "This won't last too long." Because we won't have time for questions if I do take too long.

But accountability is here to stay. You heard it from the three previous speakers. If you read this week's Chronicle, or read Chronicle on-line last week (this is an amazing world we're in today), you saw that the CUNY system has been told by its board of trustees, the institutions in that system, that the only way they are going to get new faculty positions is if they are accountable. They are going to tie faculty positions with graduation rates and other efficiency standards. So we are living in a world today where we are all being forced to be accountable. However, that world is changing and I'm going to just take a little different approach from the approach that you've heard. And I'm going to try to give you some of the nitty gritty as I see it. How those changes are occurring, what that means to a college president, and what that means to an institutional researcher, and what that relationship has to mean, so that we can get the information to the legislature, to the board of governors, and to the board of trustees.

During the 20th century, we looked at performance indicators really as accountability. All the input standards. We looked at the number of faculty with doctorates in our institution, the number of library books, the number of journal articles that our faculty wrote. How good our students were. Were they Harvard type? Did they have the grade point averages that were appropriate when they came in? Those were the things that we looked at. Then we began to move along a little bit and we began to look at questions I think the legislature wanted us to look at. What is cost per FTE? What are

our student/faculty ratios? How many degrees are we awarding? And of course we looked at what is the graduation rate of our students after four years. That has long gone by the boards.

I see, however, a real change. I see a number of trends in accountability that have made a really big difference and they're difficult, very difficult to confront. And they're issues that I struggle with on a daily basis from my institution now, which is an external degree granting institution, a little different, Charter Oak State College. But I did spend a year as interim president at one of the CSU institutions and had to look at these issues from that perspective. So I've had to really deal with this issue in a number of ways. We are now not looking at all of those inputs and there's a pressure on what are the outputs. How do we define them? I will get a little more specific about that in a few minutes. We also are looking at what we use this information for internally so that we can make the case. And I believe that accountability really is related to assessment and how we're using information. I need to know, as the commissioner had said, what my mission is, what my goals are. I have to frame the questions in relationship to my institutional mission, my goals. I have to collect the data that will help me see if I'm reaching those specific goals, analyze those findings, and then really see if it's working. If it's not I have to move on and go back through that cycle again. So if we're not using the data at the institutional level to help us improve, then we certainly aren't going to be able to make the case when we get to the state level or to the legislature.

The third thing I see happening that really complicates what assessment means is the change, the transformation in higher education. And the commissioner alluded to this in his remarks. We're dealing with a completely new paradigm. What is higher

education today? And it's not what we see in the industrial age model on the left-hand side. We're not looking only at what's happening in the classroom. We're really talking about networked education today. We're not focusing on teaching so we can't focus on the faculty the same way. We need to focus on learning. What is happening with the student in that classroom? It's not the seat time but what actually has been achieved. It's not the information that someone has been able to acquire, but is that person going to be able to use that information to continue learning, to cycle back, to get answers to questions. It's not distance education so much, but how are we providing education so that it's distance free, that it can happen any place, anywhere, right on the campus, from someone's home, from someone's work place. It's not only continuing education but its learning all the time, anytime, perpetual learning. Taking education and fusing it with work and not separating learners from learning systems. So we're living in a very complicated, complex environment and that's what I need to become accountable in.

We're looking, then, at 21st century indicators. Some of the input we talked about will still be valid. We're going to look at a whole new set of inputs. So we're going to be looking at these kinds of questions. We're looking at flexible curriculum and flexible scheduling options. We're looking at customer service so that you don't have problems in student financial aid offices. We're looking at how our faculty have changed. We're looking at how we're networking. These are some of the output, these are easy [indicators] sometimes. You can count some of this. But then it gets a lot more complicated because we also have to begin to demonstrate the value of our program. Are we achieving our mission? And that's where we need to work together.

We are looking certainly at things like graduation rates, but again not in four years. We have to begin to answer the question that we hear all the time. People say, "Well, our graduation rates are low because a lot of students don't come to us to graduate, they come just to take a course or two." Fine, I believe that that's true. I know that that's true. But if we can't demonstrate that somehow so that we can convince others that that's what's really happening, that's why even though we bring in x number of students, we don't graduate as many as we like, then we're failing. Because if we can't make that case somehow or figure out how we're going to answer that question, then we're not really accountable.

We need to look at the percentage who pass certification exams, go on to graduate schools, are successfully employed. However, not only percentages... we really need to look at: are they doing well in those particular places. And that's again a very difficult question. We are trying to do that at Charter Oak. We not only follow up with our students to find out how many are in graduate schools; we're trying to then follow up with the graduate schools to see how those students are doing. That is difficult and we are beginning to do that. But it's the kind of thing that we all have to think through very, very carefully. And of course, the most difficult one is establishing what our outcomes are in general education and in our majors in assessing those particular outcomes. That is a mammoth task. And I understand, I really am a true believer that we can't measure everything at the moment someone graduates, or even a year after. That's what is so difficult about what we do, and it's more difficult than in a manufacturing firm. They know how many things they manufacture and they know their level of error and where there are problems. As you know, we don't know that. But we have to figure out a way

to do our best to begin to come to grips with some of those questions, [some of] the questions that we are posing. Not only do we need the quantitative data, as you heard, we also need the qualitative data. Because it isn't all in the numbers. In fact, some of the things I was just talking about aren't in numbers because you can't measure those. So we have to figure out other ways as well of getting those particular answers.

What can we do together in trying to get some of this information? And this is not really advice. This is really a partnership that I think each of you need to have with your particular president to come to grips with the question of accountability. First, we can't stop doing what we've all been doing, and that is gathering the data to measure productivity. There are issues that we're facing today on the national level, on the state level. Are we being productive? Are we using our resources wisely? And we need to continue to get that information so that we know the cost per FTE, we know about the faculty loads and all that. But that is only part of the answer. If we stop there, we're not measuring quality; we're measuring efficiency. We're not really measuring what we're producing, we're just measuring how much it cost to produce each of the things we think we're producing, each of the people who are graduating.

So there's a lot more to do. We need to measure these outcomes and that means the institutional researcher needs to be engaged with the faculty in the question of assessment. And I've seen all too often that those things do not go on together. The researchers are not involved with assessment; that's considered an academic issue and that's done by the faculty. But they don't have the benefits of knowing how to measure, and how to really do the appropriate job with that. So I think there needs to be a partnership. We need to clarify what is being measured. We have to know that we are all

talking the same language and, therefore, that each institution in a system is coming up with the same kind of data so that we can speak together. We need you to provide interpretations of data and information, because, again, the numbers don't tell the story, or everyone can use the numbers in a different way to tell the story they want to tell. So we need to be together and make sure that we're interpreting data in the same way.

We need you to help us identify benchmarks. How do we know if we're doing a good job? We have to look at institutions that are similar to our institutions to make some of those decisions. And you are in the position to do that. We need to have you be part of strategic planning, but not only planning today. I think it's more strategic thinking. We really need to go out into the future and work together on looking at what things are going to be like so that we know we're working towards an outcome and as we're planning, we're also planning how we're going to measure and how we're going to be accountable. Because if we don't do that in the beginning, as you all know, we don't come out with very much at the end. We don't know if our planning resulted in anything at all.

Finally, in the kind of world we're living in we need flexibility. We need to be flexible in the way that we can think about data and information. We can't go about it in the same way we've always done. We need to look at our outcomes in a different way and make sure that we are thinking together about how we can measure that. So these are just some of the things that I feel are tremendously important. We need to tie together some of the trends that we see occurring and be ready to face this new world.

Finally, there's one other thing that I think we all, that you, can do very well. Sometimes we want to be ignorant. We don't always want all the facts. But one of the

things I think you have to keep on reminding people, in a respectful way, who are in positions in higher education, that ignorance isn't always bliss. But guess what? It's almost always obvious. Therefore, if we don't have those facts, if we don't have that information when we do go to the general assembly and ask for our share of that very, very precious pie, we will really not be able to get what we know we need to continue doing our job. So those are just a few thoughts, and we have about fifteen minutes for some questions.

Michael F. Middaugh, Moderator

We do in fact have time for questions, and if you care to ask a question, I'm going to ask you to step to the microphone and identify yourself and the institution that you're from. And to get us going, I'm going to use the moderator's prerogative and ask the first question.

Questions From the Audience

Question: (Michael F. Middaugh): Mr. Doyle indicated that a characteristic of Connecticut, one of the real goals and values of Connecticut Higher Education, is the concept of access. That's probably true for higher education in the United States. I've had over the last six years the opportunity to work with a number of European higher education institutions. Last time I looked 58% of graduates of high schools in the United States went on to some form of post-secondary activity in this country. That certainly is not characteristic of other higher education systems. It seems to me that there's probably no *single* set of accountability measures that's going to be appropriate for all of higher education. I certainly don't want to be characterized by a single graduation rate. I certainly don't want to be characterized by my student loan default rate. I'm not even

sure that the post-graduation employment placement is the one that I want to be characterized by. I guess I'm going to start off by asking Representative Dyson, and ask you four, to talk to each other: What measures is a legislature, is an appropriating body, looking for from higher education that will enable us to demonstrate that we're worthy of the trust that you've placed in us? And as a corollary, I'm going to ask how we as institutional researchers, the folks on campus that are charged with measuring these things, how can we help the president? How can we help the board? How can we help the trustees communicate that to you? So go from there.

Answer (Rep. William Dyson, Chair of the Appropriations Committee): Well, I just knew that question was coming to me. Let me give you the benefit of my response to the issue. And I want you to try and visualize this with me. As I'm sitting, trying to set the tone because I'm not going to be talking to 52 people on the committee about this. I'm going to set the agenda. I'm going to decide what's available. I'm going to establish the priorities. I'm going to do that because that's the prerogative of the chair to do that. And I'm able to do that because I have been doing it for more years than I care to remember. And [because] I've been able to do that [in a] political environment. Now I must caution here: you may not want to think politically. I do. And politics gets you what you want and need. So for that dirty work that you don't want to engage in, there I am engaging in it, and to the degree that I'm not getting from you justification for, (in a manner in which to explain), why I ought to be doing something, then you're not going to get it. So now you got a job. You've got to convince me and I don't mean just me. But you have got to convince the political environment that there is a risk that is worthy of their taking... because what you are doing is so meritorious that they will be on

shaky grounds not to do it. But that's not usually what happens. There are more than enough, unless there's somebody who has a kid in school some place and they're about the business of connecting with that kid. There's probably very little that I get for me to justify leading a charge for higher ed. Very little.

Now, to the question asked: "Well, Bill, what can we give you?" Well, I'm not quite sure what you can give me, except I know it when I've got it. And if I have it, I'll say, "Oh yeah, they got it." But if I don't have it and you're not convincing me I'm not getting it. Now you decide what that is, what that's going to be. Merle talked about FTE and I'll give you an example of something [that] can just set in my craw. I remember that we were going through budget deliberations for higher ed and it occurred to me that I needed to have a question answered that was kind of nagging at me. It just kept nagging and that was, "What is the student/teacher ratio? What is it, at the various institutions?" Let me compare that for my own edification. So I had some research done and the thing that really caught my eye is that at one university we had an enormous amount of people with a class size of one to five. I said, "Horse shit! They aren't getting anything else from me!" Because, now maybe there's an explanation for the one to five. Nobody bothered to tell me, nobody bothered to explain it, nobody said, "I'm engaged in this research, and I'm using a grad assistant, so therefore this research is going to be 'ba da da' for the state." Nobody told me, nobody came by to have a conversation, nobody said, "Bill, visit." So, as far as I'm concerned, I got somebody with a class size of one to five making out like a *bandit* because they're probably in the top bracket for salary. You know what that does to me by that institution. You aren't about to get a lot of support from me.

Now, if I'm setting the agenda for the committee, for what we're to do for higher ed and I got that in my craw about an institution as to what I think they're doing, you know what I'm putting up on the agenda. You know *exactly* what I'm going to do. I'm *not* going to be supportive of that institution. I may not be able to take all of it out, but, buddy, I can squeeze them real tight. I can squeeze them real tight and they are going to feel it. And they're going to raise the question, "What's wrong with Bill? He is anti-higher ed." They never bothered to ask me, "Bill, what's in your craw? What's wrong? What can we do? Let us show you this. Here's what we're doing." Never are they to do that. Because somehow they may not want to get their hands dirty and even engage in trying to explain to me why it is I ought to be providing something for them while I'm taking away from some senior citizen or denying some kid in primary school, or doing something else [with] somebody's health benefits. They think they're entitled to it. And, no, I don't think they are. And, no, they're not going to get it. And I may not be able to see, but I'm going to squeeze them real tight, and if I can squeeze them two, three years and up, buddy, somebody's going to holler by the end of that fourth year. Somebody's going to holler at the end of that fourth year, and can they come back at me? No, they can't come at me. Because I'm from a town that I'm going to win if I go slap a little old lady on the corner of the next block. So, you're not going to get me. The best thing to do is somebody come and talk, and they're not engaged in any talk. So who's going to win this one? Well, what is winning? So, I'll leave that and we'll talk about some more later. Somebody else.

Answer (Andrew De Rocco, Commissioner of Higher Education): I hesitate to comment on what Representative Dyson said. In answer to your question, I think from

my point of view, I would ask an institution to demonstrate a sense of responsibility. To behave in a way which is more than one of self-interest. To begin to think about ways in which it can show institutional self-interest in conjunction with the interest of other institutions. In a more practical sense, I would find a demonstration of imagination, let's say of the following sort: I would expect an institution to be able to identify the areas of interest into which it intended to expand because they were not only appropriate for the way in which the disciplines were evolving, but they also had some connections to the larger reasons, being in a state system in the first instance. But I would expect an institution that came to me with a new program at the graduate or undergraduate level in a resource-constrained environment to say, "This is a priority for us. And it is such a priority that we intend to make it, in so far as possible, revenue neutral. So as I ask you to go to your board and plead on the behalf of our program. Let me tell you what we're facing out. Let me tell you what's a piece of history that worked well then but isn't relevant to the issue today."

Now it may cost a little bit when we're all done to capitalize this but I'm not going to do what I've come to call the economy. Universities have what I call barnacle economics: they never take the boat out of the water and scrape the hull. The barnacles just keep growing on top of the barnacles. I consider it responsible for an institution to be creative in its imaginative future but to demonstrate that it's also capable of doing it's own books. And that it knows where it wants to put its money. And that it's willing to make institutional decisions that are often brave, that will bring the institution into a debate of its own values and its own interest [and] that will put faculty and others into an engaged conversation about the future of that school as a community. And for them to

understand that faculty members are not in this day and age, irrespective of tenure, useful to the institution if they're not capable of being part of the institution's future.

And I would ask collaterally a question of the following kind. This is a paraphrase of a conversation I had at one of our board meetings. They were discussing the number of graduates. And I noticed that they had had over the course of two years a total of five physics graduates, five physics majors. Well, I have some interest in that subject. So I asked the faculty dean [with] the vice president, "How do you account for the fact that you've got major capital infrastructure for physics and you only have five majors in two years?" And he launched into what I would have hoped he did, and that is a very rational discussion of why you can't have an undergraduate curriculum if you're not dealing with the natural source of philosophy. You've got to have a physics department in the university if it's going to call itself a university. And five physicists are better than none in this kind of an economy. Then I turned to him and asked, "How then do you justify the fact that you have apparently 120 communications majors this year alone? Do we need that many Walter Cronkites?"

And that means I would expect an institution to begin to study its cost centers and wonder whether a uniform policy on tuition made sense. Whether they ought not to begin to assign cost centers, something more rational in a way [for] accountability and bottom line. And maybe if the state's interest is served by more engineers and fewer communications major (forgive me if there's one in the audience, but that's an awfully soft discipline), it's conceivable that it might be in the interest of the state to provide a subvention for engineering students and a sur-charge for communications majors. That's

the kind of interest I would look for. I would then begin to believe that that institution really cared about being responsible.

Answer (John Doyle, Board of Trustees, Connecticut State University): What came to mind in answer to the question of what sort of data or what sort of information, or what sort of results would impact, as I understand it, the legislative decision to put more money to higher education. I can only respond by analogy. It would be the kind of information that would make a headline in your local paper. It is indisputable that the reason that the large institution in this state received a billion dollar, 10-year program to upgrade its capital facilities is because its basketball team won. Now you may not like that, but that's why it got it. I'm not suggesting, by the way, that that ought to be the only yardstick. But if what we promote as our worth to get more money is so obtuse that it won't make the headline in the paper, then it won't have the desired affect on the public policy makers. And my suspicion is that a very similar paradigm would exist in private universities where alumni are asked for large [donations]. If the worth of what the endeavor is all about can't be translated into simple declarative sentences and single syllable words, it's very much less likely to engender the kind of support it needs. By the way, just to tie this back to where I started, I do think the matter of enhancing educational opportunity for traditionally underserved populations is a saleable result when we achieve it, in terms of [attracting] additional financial support.

Answer (Merle Harris, President, Charter Oak College): I think you've heard there isn't one indicator for sure. The important thing is, from the president's perspective, I wouldn't want one indicator. I think we need to have multiple indicators, first of all, for multiple audiences because we're making different cases when we're

looking at different places for funding or for accreditation, or whatever our problem is at the moment. So I think we need to collectively look at multiple indicators and always recognize that institutional missions are different. Even within a system there will be differences in institutions. And therefore, we have to explain that very carefully on the things that we can be measured the same. We need to recognize that we need to be measured the same. And in other areas that relate to our particular mission, we have to come up with the case in a way that is clear to the audience that we're making that case in front of, as to what we're trying to do and what we have achieved. I think that's where we have to look.

Question (Fred Volkwein, SUNY @ Albany): In New York State we are hearing some of the same things from our trustees and legislators and campus presidents that we've heard here. One of the things that I'd like to, I guess, fuss with a little bit, is the fact that down in offices where the rubber meets the road very few of us are over staffed or under worked. ["That'll get you nowhere!" from panel]. And so keeping up with the constant demand for, especially information by external constituencies, is a constant source of energy drain on us. The one thing that has really struck me lately, at least in New York State, and I assume it probably is true in Connecticut too, [is] that we are being on the one hand rewarded in the guidebooks not for access but for selectivity. We're being rewarded for quality and effectiveness. And yet what we're hearing from the state legislature and others *is* an emphasis on access and not on selectivity. And there seems to be some uncomfortableness, sometimes trade offs, in the language that's being used. There is on the one hand a force and a system principally the most visible of which is in the guidebooks ratings: US News and World Report, Fiske's, Baron's, Yale Insider's

Guide, all of the various guidebooks that have proliferated. And they're telling us, they're giving us one message and penalizing us, for example, if we are not selective and if we do provide a great deal of access. And yet, on the other side, we're getting this other message, and I think a lot of us are having trouble figuring out what the game is, and I think we're behind the curve. I think it helps to have this kind of a session because we maybe need a reality check. We are getting very, very mixed messages...sometimes even from our own campus managers and officials about what the game is that we're involved in and who is keeping score.

Answer (Rep. William Dyson): I'd like to respond to that. I know you were just making a comment, but I'd like to respond because of something I thought that I'd get from this group, but I haven't gotten [it] and I deliberately did not mention it. Mr. Doyle talked about access. What I'm trying to do: as I said I, was going to come in and I was going to rattle some cages. I want to really say something just to fire people up, and you know they'll come at me about something. But more than that I want to get you to thinking about things. You see, education is important to me. And I understand that noble calling stuff, I engage in it. I also understand how educators undermine their own existence by virtue of what they *don't* do. One thing I find most frustrating is dealing with educators in a political environment. They are super clean about the whole thing. Yet they teach it. But they're clean about the politics. And when I say the politics I'm talking about what it is that you engage in in terms of setting priorities and how those competing priorities interact with one another. And for educators, it's only education and nothing else. But until you talk to [educators] privately, and their mother's in a nursing home, then you get another song that they sing. Or if their kid's in school then you get

something else. And you know if it's something related to crime then they feel a little uneasy, all those things. And see I'm listening to all of it. You're only getting one. But I'm listening to all of it and how to deal with it. Now if you're going to influence the process, and that's what you need to do, what do you think I'm interested in? Out of all that stuff that you've heard about from child care to senior citizens to higher ed to primary to corrections or judicial - all of it. What do you think I'm interested in? And that's probably the most important. What's on my mind for me. And what's on my mind for me that Mr. Doyle mentioned is access. Access for whom? But if you aren't talking about those folks that I have on my mind who are not at that school and you're trying to convince me for some more money, buddy, you're talking to a wall. I may not say it to you but you jolly well ought to know that that's what interests me. That's major on my mind based upon where I'm from. And you don't talk about it? You don't raise it as an issue? You don't say a thing about it? Yet, "Bill, we need some more money." Go suck air, fella! You get nowhere with me with that. But now anybody whose smart about it (access), how do we demonstrate that we're doing our job. Okay, show me some. And I know it when I see it. And if I don't see it then you aren't doing it. And if you're not doing it then clearly you're protecting your interest. And what is your interest? What you got. And what you got isn't what I got. And when I say I, I'm talking about those people that I'm representing. So until you start thinking that way, acting that way, you don't do service to higher ed, the kind of service that it needs. Because until we become all embracing of everybody and their needs and interests, jobs and the whole bit, being prepared for the future, how we do in our business, the whole gamut...irf we're not doing

that: "Get out of here, get out of here." You're not convincing me of anything. And that's when I have to contend with with those 52 people.

Moderator: Michael Middaugh Anyone else on the panel want to react?

Answer (John Doyle, Trustee, University of Connecticut): The issue you just raised was the subject of a very spirited debate at our committee meeting (Jennifer, I don't know if you were there, about two months ago), when we wanted to change some need-based scholarships that we were offering, to performance-based scholarships. The matter, as I recall, was tied in the committee and had to be referred to the full board for resolution. Now I've raised that because what you're suggesting is obviously a significant item that got bumped up. My response to it is maybe too simplistic. When I went from a state regulatory agency to an agency that was regulated, I was talked to by one of the senior officials. The chap said, "Look, if you have any doubts about which side of the fence you're on, the regulat*ed* or the regulat*or*, take a look at the name at the bottom of your paycheck." In our case, the name at the bottom of our paycheck is "Public Institution." So if it comes to prestige in some rating agency, or access, it's a real easy question for me to answer.

Answer: (Merle Harris, Pres. Of Charter Oak College) I believe that the indicators that you pointed to are used so often because those are the only ones we have. So, again, they're looking at the input, what we're bringing in to our institution, because we haven't been able to make the case very well of what we're turning out. Sure, Harvard comes out much higher. But as we heard, they may not be doing very much in those four years to make a change in someone's life. And I think we have *not* been able to make that other case, so we know why U.S. New and World Report, and all these magazines use that

other information. And then, we begin to measure ourselves by that data. So I think we have to be careful because if we don't do anything else, then we'll just continue to just use that kind of information.

Answer: (Andrew De Rocco, Commissioner of Higher Education): Let me piggyback on what Merle has just said. I think because this is a community of institutional researchers, as a great physicist once said, "Research means you will not find the answer in the back of any book." I don't think anyone at this panel can tell you what it is that you need as researchers to do. If you are data collectors, you're not researchers. If you're researchers, your life is more formed by the questions you ask that are related to those things which need to be known in order to be able to create a working model for outcomes. I can't tell you – Rep. Dyson, Bill, says he sees it, he knows it when he sees it – well, there are others who have an instinct for whether what you're being told is meaningful or not. But those who are in the position of making decisions have to rely upon others who bring them formidable arguments, buttressed by information, and buttressed by an interpretation of the information that says, "We as an institution are doing x, y or z." If the issue is access, as Rep. Dyson is certainly aware, when my agency goes to him and says we need more money for the minority advancement program, because within ten years we have gone from five or six percent representation to parity with the state, he understands that. He also understands that I've got evidence for it, so he isn't shy in helping me to put money into that program. But there are other issues besides the issue of access that ought to be capable of analysis. I don't know what institutional research is about. I know how to do, or did know how to do, some of it in physics, but if you guys have a reason for existing, other than simply being number

crunchers, then there must be some fundamental question, some interesting collection of theoretical ideas, that ought to motivate what you do. You ought to be coming to us and telling us what it is we ought to be demanding of you, because that is not only what you can collect, but because it's actually interesting.

Michael Middaugh, Moderator: On that note, I want to convey to you that I just got the sign that we're running out of time. Before we break up, I want to thank each of our panelists for a marvelous presentation. If your schedules permit, please join us at the reception. If you'll join me in giving them a welcome round of applause, thank you very much.

THE UNIVERSITY OF DELAWARE LONGITUDINAL STUDY OF ACADEMIC AND PERSONAL DEVELOPMENT: SUMMARY OF FINDINGS FOR THE FRESHMAN THROUGH SENIOR YEARS, FALL 1993 THROUGH SPRING 1997

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To better understand the cognitive and social development and experiences of undergraduate students, a longitudinal study is under way with the Class of 1997 at The University of Delaware[1]. This project consists of several components: a fall survey completed prior to matriculation; a spring survey completed in late spring or early summer during enrollment, focus group discussions with a subsample of spring survey respondents, and an alumni survey one year following graduation. This paper presents findings for data collected from the freshman through senior years on the subset of students who completed all five surveys from Fall 1993 through Spring 1997. Findings thus examine activities and attitudes reported by respondents each academic year as well as changes occurring from the freshman to senior year.

Outline of Data Collection Strategy

Quantitative and qualitative data were gathered for this project at specific points during the baccalaureate experience. During New Student Orientation in July 1993, a *New Student Survey* was completed by over 1,600 new students. This survey obtained demographic information as well as information on programs and services in which students anticipated involvement. On this survey, students also indicated the importance of activities (e.g., being active in politics, participating in programs to clean up the environment, etc.) personal values (e.g., importance of promoting racial

[1] This study was begun with a small research grant from NEAIR; the author wishes to express her thanks for the grant funding which helped make this study possible.

understanding), satisfaction with financial aid offerings, and level of confidence for their academic success.

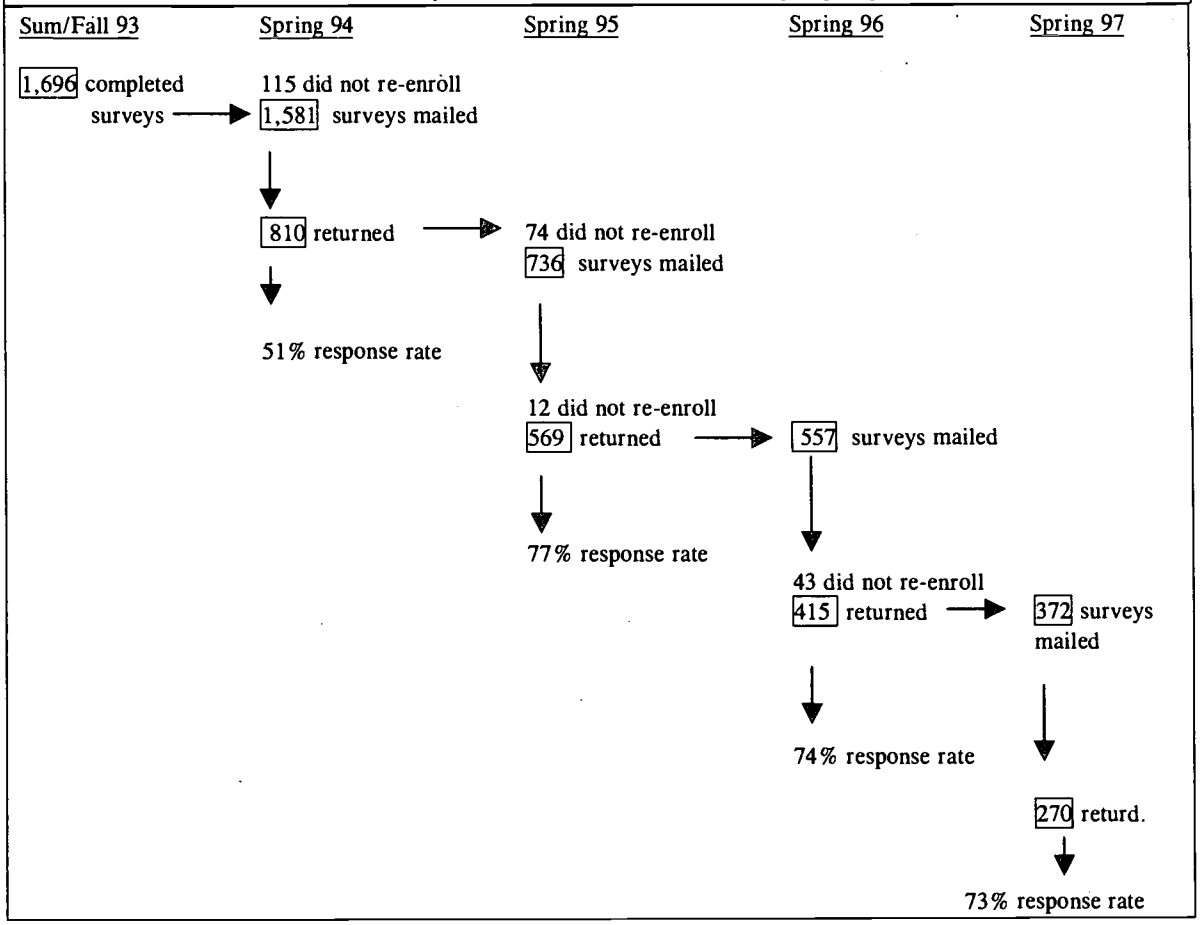
In April 1994, a second survey was sent to students who had returned the *New Student Survey* and who were still enrolled at UD. The *Spring Survey* examined the curricular and extracurricular activities in which respondents were involved, their satisfaction with campus, and the intellectual and personal areas of growth for them over the past year. Thus, with each collection effort, new data was added for each student that enabled me to chart changes from year to year and growth from the freshman through senior year.

Spring Samples and Major Findings

Response Rates. Perhaps the largest obstacle for any longitudinal data collection effort is cohort mortality. Each year, attrition from a longitudinal project produce a smaller number of potential respondents (See Figure 1). Each year a portion of the cohort did not return to the University, and of those who did return, a portion did not return the completed survey. Each subsequent year, the *Spring Survey* was sent only to those students who had returned the previous spring's questionnaire. As shown in the figure, the response rate was the lowest in Spring 1994; in subsequent years, approximately 3/4 of the cohort completed the surveys[2]. Analyses for this report are based on the final sample of 270 students.

2 I believe a major reason for low response rates was due to few or no incentive awards. In Spring, 1994, I offered no incentive for return of the survey; in subsequent Springs, I offered the opportunity for those who returned the survey to be included in a random drawing for one of five cash awards, ranging from $25 - 100 each.

Figure 1
Cohort Mortality From Summer/Fall 1993 Through Spring 1997



For each Spring survey, a follow-up postcard, personal phone call, and/or second copy of the questionnaire was mailed to all respondents approximately three weeks after the initial survey was mailed. The Spring 1995 response rate was 77 percent; the Spring 1996 rate was 74%, and the Spring 1997 response rate was 73%. Due to cohort mortality, findings presented may represent a biased sample of respondents. Thus, findings must be interpreted cautiously, since findings do not generalize to the full University student population. They can, nevertheless, be useful in examining student growth and activity patterns over time.

Respondent Demographics and Fall 1993 Findings

Two hundred-seventy UD students completed all five surveys from Fall 1993 through Spring 1997. Of this group, 203 (75%) were women, 255 (94%) White, and

15 (6%) were Black or other minority. As shown in the Table 1, these students began their studies at UD with high hopes and intentions to succeed. Sixty percent or more felt that high school had prepared them well for writing & composition, math, sciences, and history tasks.

Table 1
Percent Who Said High School Had Prepared Them Well for these College Subjects:

Task	Percent
Writing and Composition	67
Math	65
Sciences	63
American & World History	60
Social Issues	50
Study Skills	45
Foreign Languages	43
Art, Music, Drama	32

Levels of satisfaction with UD during the first year and plans for their future after graduation were high. When asked if their satisfaction with UD had changed since entering, 92% said their level of satisfaction was the same or were more satisfied as end of year freshmen. When asked if they could choose the same baccalaureate institution again, 86% of the freshmen said they would choose UD again.

As entering freshmen, 74% said they planned to pursue graduate level education. Almost no one expected to fail, and very few expected to drop out before graduating. When asked how important a list of goals were, 98% said that gaining knowledge and skills directly applicable to a career were very important, but only 38% were highly interested in learning about other languages and cultures. Respondents were also asked how well high school had prepared them for college level academic tasks. As shown below in Table 2, the majority believed they were well prepared for writing and composition, math and science, but less than one-third felt prepared for cultural art, music and drama.

Table 2 Students Who Said These Goals Are Very Important	
Goal	Percent*
Gain knowledge & Skills directly applicable to a career	98
Learn to think creatively and analytically	84
Learn more about myself	78
Gain a broad, liberal arts education	63
Learn about other languages and cultures	38
* indicates percent who said goal was 'important' or 'extremely important'	

A key factor in college withdrawal is a lack of congruence between students' expectations and reality. Respondents' perception of high school preparation was significantly correlated with reported level of satisfaction during Year One. As shown below for all six areas listed, respondents who said they felt well prepared were more likely to report higher satisfaction during their freshman year:

Correlation coefficients - high school preparation with level of satisfaction in Year 1:					
Writing	Language	Science	History	Social Sciences	Study Skills
.146*	.140*	.188**	.144*	.123*	.132*

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

Table 3 lists the percent of respondents who reported they had a good or very good chance of completing tasks during their first year. As shown, the majority of respondents expected to experience academic and interpersonal skill development. While 87% expected to maintain a B average or better, very few respondents expected to transfer before graduating, drop out, fail, or need extra time to complete their degree.

Reported Activities and Changes from Spring 1994 through Spring 1997

Self-reported cumulative grade point average (GPA), changes in major, and satisfaction with UD are presented in Table 4. The finding of an increased mean GPA was consistent for respondents by gender and ethnic category, but women and white students reported higher GPAs than men and minority students. Relationships between first year GPA and subsequent growth, satisfaction, and academic success are discussed later in this paper.

Fluctuations in level of overall satisfaction with The University are consistent with the 'sophomore' or 'junior level slump' noted by other researchers (Wilder, 1993). During their baccalaureate years, a small percentage of students in this study moved from being more optimistic and satisfied as freshmen, to less enthusiastic upper classmen (when asked how their satisfaction had changed over the past year 8% during the freshman year compared to 15% during the senior year). At the same time, however, another group of respondents indicated high levels of satisfaction during the freshman and senior years, with fewer students reporting greater satisfaction during the sophomore and junior year.

Table 3 (As incoming freshmen)
Percent of Students Who Said They Had a "Good" or "Very Good" Chance of Completing the Following Tasks:

Task	Percent
Be satisfied with UD	96
Have UD friends of different cultures	88
Maintain a B average	87
Develop regular study habits	82
Find a job relevant to my major	65
Go directly to graduate school	49
Graduate with honors	45
Transfer before graduating	12
Need extra time to complete my degree	11
Seek personal counseling	9
Party more than study	6
Fail one or more courses	4
Temporarily drop out	3

Self-Reported Gains

A major component of this study examined the self-reported student growth during college. To that end, this sample of respondents indicated how much they had grown (1= no growth; 5= extraordinary growth) over the past year for a series of 36 academic and social skills items. Across all four years, respondents said they achieved the greatest growth (consistently high scores across all four years) in these items:

- Exercising personal responsibility
- Functioning independently
- Gaining factual knowledge
- Gaining exposure new intellectual areas.

The largest change in freshman to senior year scores were for these items (change was

in positive direction toward greater agreement):

- Preparing for graduate or professional school
- Gaining knowledge and skills applicable to a career
- Developing a clearer idea of my career goals and plans
- Preparing for active participation in a democratic society.

For some Gains questions, respondents indicated relatively high growth all four years, but reported the highest growth in Year One, followed by slightly lower gain (e.g., adapting to a different social situation; exercising personal responsibility, self-discipline). For other questions, however, growth was highest during their upperclass years (e.g., functioning effectively as a team member; building a record of academic achievement that will enhance my future; developing a clearer idea of career goals and plans). This increase during the later years may be due to students' increased knowledge of self, self-abilities, and the ability to cognitively evaluate and synthesize content knowledge as juniors and seniors.

Table 4 GPA, Major Changes, and Satisfaction with UD

	Spring 94	Spring 95	Spring 96	Spring 97
Cumulative GPA				
Overall	2.86	2.92	2.98	3.02
Men	2.84	2.88	2.99	2.98
Women	2.87	2.93	2.97	3.03
Minority Students	2.67	2.66	2.67	2.75
White	2.87	2.93	3.00	3.03
Number of Times Changed Major (during each year)				
One or More Times	13%	29%	18%	6%
Satisfaction with UD (since beginning of this year)				
Less satisfied	8%	12%	13%	15%
About same	51%	53%	57%	45%
More satisfied	41%	35%	30%	40%
Overall, I would choose UD again				
Probably/definitely No	3%	7%	6%	6%
Unsure	11%	11%	15%	13%
Probably/def. Yes	86%	82%	79%	81%

Attitudes and Experiences

This study also sought to examine students' attitudes about and experiences during their baccalaureate years. Respondents were asked to indicate on a 4-point scale their level of agreement with a series of 34 statements (1 = strongly disagree; 4 = strongly agree). Items that had the highest level of agreement involved respondents' experiences with faculty and friends, and their desire to do well academically. Across all four years (Spring 1994 through 1997), respondents had consistently high agreement with statements:

- Getting good grades is important to me
- I know several UD students who would help me if I had a problem
- I have developed strong friendships with other students, and
- Generally I put forth a good deal of effort into being well prepared for exams.

Agreement with these statements likely indicates that these respondents succeeded in enhancing their social relationships while balancing their academic responsibilities. The attitude & experience items with the largest increase in agreement over four years were:

- I have a friendly relationship with at least one faculty member
- My non-classroom interactions with faculty have had a positive influence on my career goals and aspirations
- My out of classroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes, and
- Most of the faculty members I had contact with this year are genuinely outstanding or superior teachers.

A steady annual increase in mean scores for the activity and attitudes questions likely indicates student growth and personal development over the baccalaureate years. For example, many questions related to respondents' experiences in the classroom and with faculty show a steady increase in mean scores from Spring 1994 through Spring 1997. These scores likely indicate that respondents refine their sense of self, become more assertive in speaking up in class and/or with faculty after class, achieve greater academic and personal self-confidence, and become more comfortable with their place within the higher education community.

Factor Analyses of Gains and Attitude/Experience Scores

Exploratory factor analyses established three factors to more easily examine the 36 academic and personal social gains and four factors for the 34 attitude and college experience items. The seven factors are:

Academic and Personal/Social Gains

Factor 1: Personal Independence
Factor 2: Academic&Career Knowledge
Factor 3: Cognitive Growth

Attitudes and Experiences

Factor 4: Faculty & Classroom
Factor 5: Interpers. Relations
Factor 6: Academic Self-Confid.
Factor 7: Academic Preparedness

Group mean scores for each year are presented in Figures 2 and 3 below:

Figure 2
Mean Scores, Spring 1994 - Spring 1997
Factors 1 - 3

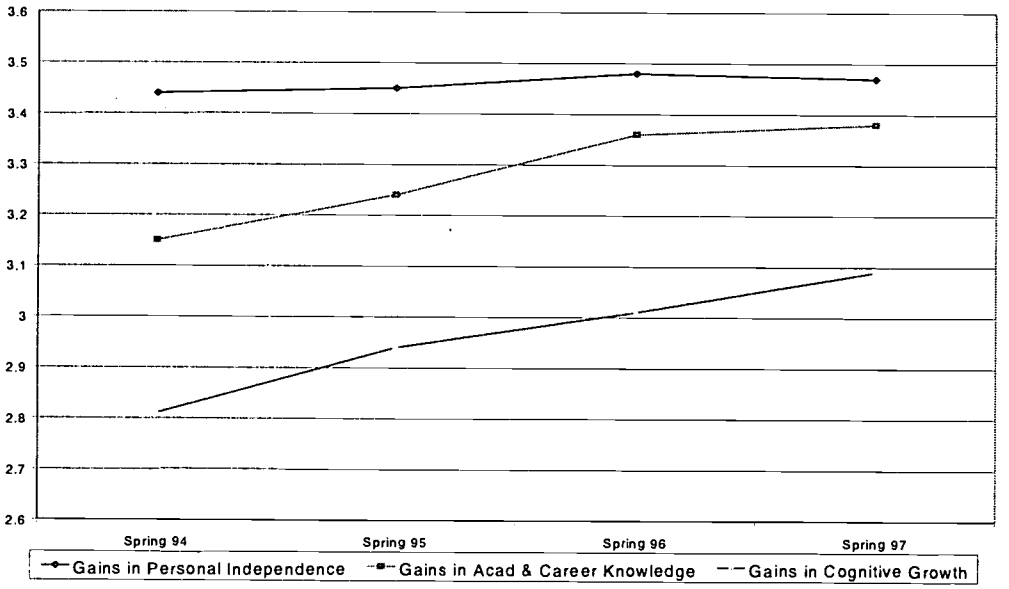


Figure 3
Changes in Mean Scores Factors 4-7

As expected, mean scores most of the factors increased from the freshman to senior year. Except for the *Academic Preparedness* factor that remained constant over the four years, scores for the other six modestly increased from 1994 to 1997. The largest mean increase for the gains factors was for *Gains in Cognitive Growth*. The largest increase for the Attitudes and Experiences Factors was *Faculty and Classroom Experiences*.

Relationships Between First Year Experiences and Subsequent Satisfaction and Growth

Findings from respondents in this study confirm previous findings that experiences incurred during the freshman year are related to subsequent satisfaction, retention, and academic success. Correlation analyses revealed a significant negative relationship between number of times that respondents changed major and overall satisfaction with UD ($r=-.191$, $p=.002$ at end of freshman year; $r=-.194$, $p=.001$ at end of sophomore year).

Along with issues of satisfaction, respondents who said they planned to pursue a graduate degree reported significantly higher GPAs during each year. In addition, as

shown in the correlation matrix below, respondents' GPA is significantly correlated with factor scores for *Gains in Academic and Career Knowledge* for three years as well as for *Faculty and Classroom Experiences*, *Academic Self-Confidence*, and *Academic Preparedness* across all four years. These findings confirm the need to offer a balance of support and frequent distribution of information to ensure successful integration into campus activities during the freshman year.

Correlation Coefficients for GPA with Mean Factor Scores				
	Cumulative GPA reported in term:			
	Spring 1994	Spring 1995	Spring 1996	Spring 1997
Factor 1 - Gains in Personal Independence	-.052	-.004	-.029	-.006
Factor 2 - Gains in Acad. & Career Knowledge	.157	.270*	.198*	.245*
Factor 3 - Gains in Cognitive Growth	.038	-.006	.025	.065
Factor 4 - Faculty & Classroom Experiences	.264*	.222*	.211*	.255*
Factor 5 - Interpersonal Relationships	-.001	-.098	.007	.055
Factor 6 - Academic Confidence & Satisfaction	.645*	.587*	.521*	.607*
Factor 7 - Academic Preparedness	.283*	.231*	.333*	.346*

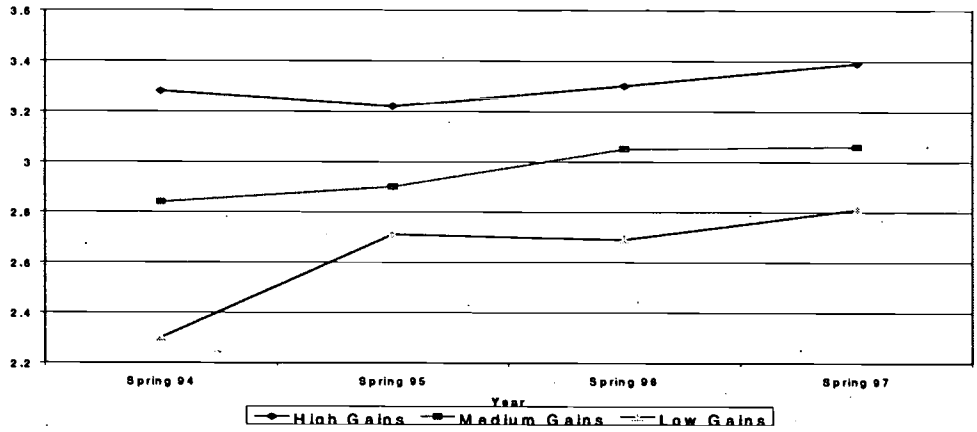
* $p < .01$

Differential Growth By Year One Gains Scores

To further examine student scores, a Total Gains Score was calculated for each respondent by summing their score on all 36 Gains items. Total Gain Scores ranged from 64 to 175, with higher scores indicating greater self-reported growth. Respondents were then divided into three groups: 1). High Gains- the top 1/3 of the total group, whose total score was 121 or higher; 2). Medium Gains- the middle 1/3 whose total score was between 109-120; and 3). Low Gains- the lower 1/3 whose total score was 108 or lower. Mean scores for each factor and cumulative GPA were then graphed by the three Total Gains categories. As shown in Figures 4-6 below, respondents with a low Total Gains score in their freshman year consistently reported lower gains, less satisfaction, and lower cumulative GPAs across during all four years.

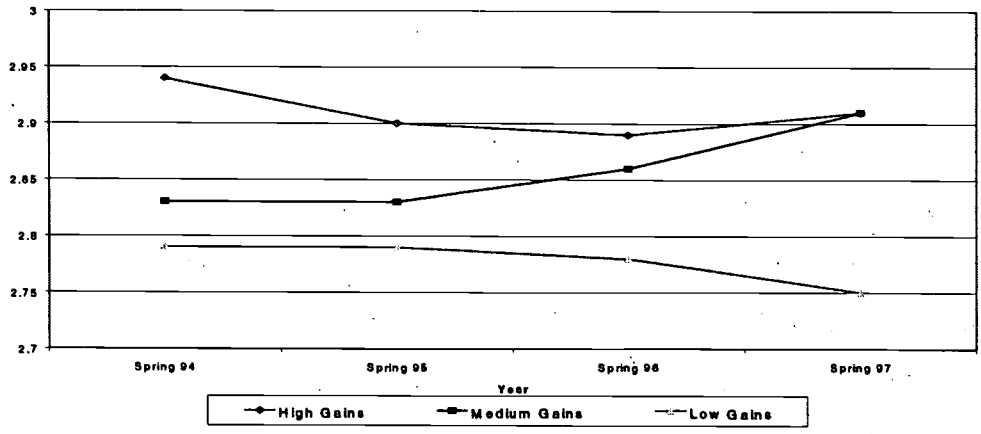
In most instances (as shown in Figure 4), all respondents, including those with Low Total Gains report slightly higher scores in subsequent years, but in every case, those with Low Gains still lag behind those with Medium or High Gains Scores. Scores on one factor, *Academic Preparedness*, however, are discouragingly different.

Figure 4
Mean Scores by Freshman Year Total Gains
Factor 3 - *Academic and Cognitive Growth*



As shown in Figure 5, respondents who report low Total Gains not only reported lower levels of academic preparedness as freshmen and sophomores, but their level of preparedness dropped even further as upperclassmen. This finding indicates

Figure 5
Factor 7 *Academic Preparedness* By Total Gains Score in Year One



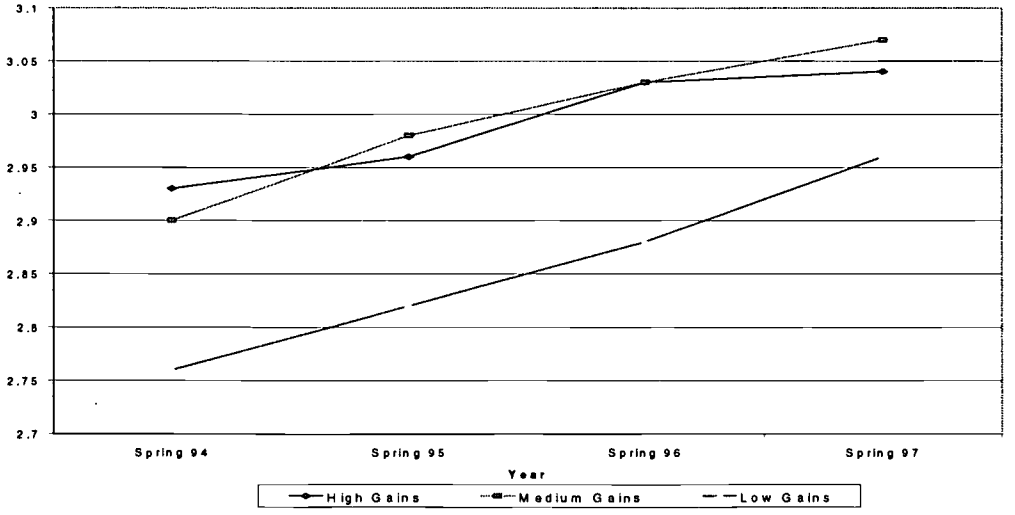
that higher Year One Total Gains likely affect[3] a students' continued growth and success throughout the entire baccalaureate experience and points to the need to ensure a strong start for students as freshmen.

Comparison of Longitudinal Results with Other UD Data and Implications for Future Action

Since its inception, the Office of Institutional Research and Planning has engaged in the study of University students. While we can not make one-to-one comparative statements between the UD Longitudinal Study (UDLS) and other cross-sectional analyses, it is appropriate to compare UDLS findings with other data reported by recent students to examine similar trends.

On the UDLS, 74% of the respondents as incoming freshmen, said they planned to pursue graduate education and 51% said they would go directly to graduate school following baccalaureate work at UD. While many researchers (in Pascarella & Terenzini, 1991) report higher retention rates for students who plan to pursue graduate education, the number of UD students who enroll in graduate education soon after completing their baccalaureate work is significantly lower. Data from the Career

Figure 6
Self-Reported Cumulative GPA By Year One Total Gains Score



3 This finding points to the likely relationship between the variables, but a causal relationship can not be proven.

Plans Survey (administered to graduating seniors approximately 6-12 months after graduation; Trusheim, IRS 97-01) shows that on average over the past decade, about 15% of UD undergraduates pursue graduate education immediately following baccalaureate study. This disparity between plans as freshmen and actual attendance after baccalaureate graduation may be due to a change in career plans, life and family goals, and/or postponing graduate school until later in life.

Less than 1/3 of the UDLS respondents said they felt well prepared for art, music, or drama after high school, and less than 38% said they were highly interested in learning more about other languages and cultures. This information should be shared with local K-12 teachers and administrators who might wish to enhance their curriculum with more cultural events. In addition, UD officials might wish to review the characteristics of Generation X students (e.g., Bauer, in press; Ritchie, 1995; Zill & Robinson, 1995) which may offer insight into novel ways to encourage more students to take advantage of the many cultural activities (including study abroad) that occur on or near campus.

Eighty-seven percent of the UDLS incoming freshmen expected to maintain a B average or better. To help students understand college-level grades and expectations for learning, faculty may wish to spend more time discussing with students their criteria for certain class grades. In addition, students who receive prompt and frequent feedback throughout the semester are more aware of their grade as the term progresses and are less likely to be surprised by a low grade at the end of the semester.

Findings in this study show a significant negative relationship between the number of times students change major and overall satisfaction with the University. A recent analysis of time to graduation (Graham, IRS 95-02) showed that, on average, those students who made one or more major changes increased their time to graduation by one-half semester. Early intervention with freshmen, in programs such as the Career Planning Center's *Major Mania*, may help undeclared and other freshmen and sophomore students clarify their educational goals. In a related study (Bauer &

Horowitz, 1995) on student dropouts, 1/3 of the students who dropped out (but in good academic standing) did so because they were unsure of their academic goals.

Somewhat lower levels of satisfaction during the sophomore and junior years can be attributed to many possibilities, including: unclear career/educational goals but feeling pressure to declare a major; parking, commuting, or course scheduling concerns; roommate or other relationship issues; increased course load and subsequent homework/lab requirements; and/or cognitive dissonance with new information being presented (different from previously held notions). A review of life events that occur for students at each class level might reveal the perceived burdens that students share. Curricular loads for many students increase in the sophomore year. Students may report lower satisfaction due to additional stress from increased academic demands as well as from other life events such as interpersonal relationships.

It is also possible that a substantial part of the perceived lower satisfaction involves students' yet unresolved assimilation of old (pre-college) and new (post-matriculation) information and attitudes that occur through campus activities (Piaget, 1972). Especially true for traditional aged students, campus life brings the challenge of interacting with people of different ethnic groups, religious beliefs, and personal values. When first confronted with difference, it is not unusual for some students to assign negative thoughts or rely on preconceived stereotypes (Deaux & Lewis, 1984). Through repeated interaction and dialogue with ideologies or others who are different, many students engage in the cognitive process of assimilating some new ideas to incorporate as their own. If students engage in thoughts and actions which allow for cognitive assimilation during or by the end of the senior year, they might report higher levels of satisfaction as seniors based in part on their new understanding of the world around them.

UDLS respondents reported greatest growth in exercising personal responsibility. Due to the traditional age and developmental level of UD new freshmen, this finding confirms the need for students to feel knowledgeable about and comfortable in their social and living environment before they will turn their focus to

academics. As new freshmen, many of whom are away from parental guidelines for the first time, these respondents acknowledged their movement toward adulthood and adult responsibilities. High gains in independence and acquiring factual and other intellectual knowledge indicate an increased level of maturity as they progress from freshmen to seniors. In addition, these gains indicate that students have met some of the major goals of the UD undergraduate education, " ... to communicate clearly as speakers and writers, and to become informed citizens and leaders" (*UD 1997-98 Undergraduate Catalog, p. 2*).

Respondents with a Low Total Gains Score during the freshmen year reported lower gains and cumulative GPAs throughout their baccalaureate experience, and those with a lower cum GPA reported lower mean factor scores across all four years. These findings confirm the need for a high level of information and support during the freshman year. If students do not get off on the right foot as freshmen, it is possible that they spend too much time playing catch-up and end up not getting as much out of college as those who do make a smooth transition on to campus. Achieving that delicate balance of support and stimulating challenge, at a time when students are refining values and definitions of self, will help ensure a strong start for future growth and success.

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NEW APPROACHES TO THE ANALYSIS OF ACADEMIC OUTCOMES: MODELING STUDENT PERFORMANCE AT A COMMUNITY COLLEGE

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Methodological Introduction. Since the Fall of 1990, the Office of Institutional Research and Analysis at Prince George's Community College has been tracking the academic careers of a cohort of first-time entrants (N=2,643).[1] In an earlier conference paper,[2] we presented a community college-oriented approach to measuring academic achievement and illustrated its utility in an exploratory regression analysis of the predictors of Cohort 1990 four-year outcomes. In this paper, we present an analysis of Cohort 1990 six-year outcomes, one which moves beyond exploratory research to a more fully-realized causal understanding of the forces impinging on student academic progress at PGCC. While regression has much to recommend it as a data-exploratory technique in the early stages of research, its linear-additive structure implies a causal structure inherently unrealistic, given the complexity of the academic process. This is illustrated in Figure 1, below. The reality envisioned by regression analysis is of the Model A type — a single "dependent" variable (DEP) is influenced by a series of predictor variables (IND1-IND3), each impacting directly upon the dependent variable and none of them intercorrelating with any others (independent effects, hence "independent" variables). The B Model, on the other hand, rests upon a whole series of recursive linear equations permitting the representation of mediated effects, joint effects, local interactions and chains of causality.

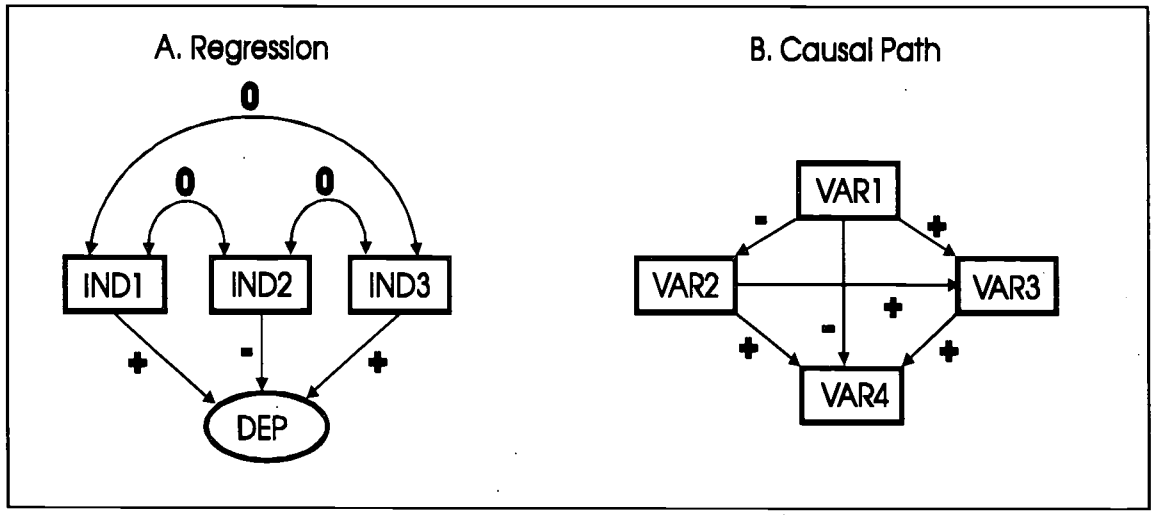
Path Analysis. This approach, called *causal path analysis*, can much better capture the more convoluted reality of the academic process. For example, suppose VAR4 represents a measure of student goal attainment, and VARs 1-3 respectively measure student age, study load and grade point average. In this case, Model B would suggest that AGE affects GOAL not only directly (the single negative VAR1-VAR4 arrow) but also indirectly by impacting positively on GPA (directly and positively

[1]The Cohort 1990 data set was drawn from PGCC student record databases, augmented with material supplied by the Maryland Higher Education Commission's Transfer Student System to enable us to identify cohort members who ceased community college attendance due to transfer to a Maryland four-year public post-secondary institution. Attendance, study progress and related data were all organized on a term-by-term basis so that we might assess student academic status and level of achievement at any term point in the cohort's effective six-year life span, connect patterns of attendance with outcomes, and summarize any part of the process in terms of time to outcome.

[2]Boughan and Clagett (1995). See also Clagett (1995), and Boughan and Clagett (1996).

correlated with GOAL) and negatively on LOAD (directly and positively correlated with GOAL). Additionally, the model would make explicit a second LOAD>GOAL path, one detouring through GPA.

Figure 1. Two Types of Analytical Models



If the B Model represents the true state of affairs, running a straight regression of these same three academic process variables upon GOAL would result in serious underestimates of their predictive power: only their *direct* effects would be gauged individually, while their *indirect* impacts on the behavior of GOAL would be absorbed into the opaque residue of explained variance represented by the difference between R^2 and the sum of all squared part-correlations. (The explanatory force of AGE, with *two indirect links* with GOAL obscured in the analysis, would be particularly under-assessed.) Furthermore, all that is most interesting from both a theoretical and educational policy perspective — just how the components of the academic process work together in complex interaction patterns to produce academic outcomes — would be lost.

In this paper, we present the results of a causal path analysis of the academic process at Prince George's Community College, based on data used in a six-year tracking of the college careers of Fall 1990 first-time entering students. The components of the model cover all major process domains: student socio-economic and cultural background, secondary educational experience and performance, student attitude and motivation, student academic and occupational objectives, institutional financial and academic support, college preparedness level and remediation history, critical early term experience, study load and academic effort, attendance pattern and study persistence, and course performance and program progress.

The web of causality uncovered is graphically embodied in an academic process *map* which makes explicit all critical variable links (single-headed arrows) found by the path analysis, along with their associated *path coefficients* (measures of the causal interaction between pairs of variables joined by a path when the effects of all preceding linked variables have been statistically eliminated). The discussion will focus on identifying the key model components (process variables strategically located at the juncture of many paths) and principle "trails" (chains of paths characterized by high path coefficient totals) leading to the summary academic achievement measure.

Cluster Analysis. As a supplement and complement to the path analysis just described, we also present the results of a K-Means *cluster analysis* of essentially the same academic process data. Our path analysis produced a well-defined and theoretically intelligible model of the academic process, but also one highly abstract and difficult to relate to practical educational policy concerns. Its model provides a clear theoretical picture of how the academic process works *on average*, but often more helpful to educational policy makers would be a concrete modeling of the *varieties* of academic processing taking place. Cluster analysis involves sorting cases into "clusters" which are maximally within-group homogeneous and without-group heterogeneous, according to the patterns found in an all-case distance matrix based on multiple dimension scores. When applied to our Cohort 1990 tracking data, its product is a typology of stable student career patterns defined by the main variety of treks actually made through the academic process. While path analysis models the academic process itself, cluster analysis, in effect, models the *student body* with respect to the workings of the academic process.

Past literature on community college academic outcomes has tended to focus on simple divisions of students into achievers and non-achievers; persisters and non-persisters; full-timers and part-timers; adult learners and immediate-from-high school entrants; the transfer-bound and the occupationally-oriented; the college-prepared and those "at-risk"; the community participants and the isolates. In this paper, the presentation of our cluster-analytic results will focus on how the emerging ten-fold classification scheme collates these and other such process categories into a single, well-realized set of recognizable student types, in the process revealing that, at PGCC at least, there are several different roads both to academic success and to academic frustration.

Modeling Components. In all of the results to follow, the variable of prime focus was Academic Achievement (ACHIEVER). The ACHIEVER classifier was developed by the Office of Institutional Research and Analysis as a simple summary measure of positive academic outcome for college internal assessment reporting, and takes the dichotomous form 0=Non-Achiever/1=Achiever. Classified as Achievers are all members of a cohort who earned an academic award (associate degree, occupational certificate or occupational letter-of-recognition); successfully transferred to a four-year post-secondary institution; or who accumulated 30 or more credit hours in good academic standing (sophomore status).

Selection of the predictor variables was more difficult. Our earlier regression research, involving over 90 separate independent variables, quickly alerted us to the need for a radical data reduction program. Not only was this very large data set extremely awkward to manipulate and interpret, regression statistics implied a truly confounding level of multicollinearity. Reduction to a manageable list of predictors was mainly achieved by means of factor analysis,[3] which transformed the original vast array of variables into just 11 factor scales. These are summarized in Table 1 above, which provides the name used to identify each factor scale in all data displays, a capsule review of the original variables loading most highly on each and defining each's underlying sense, and a descriptive title.

TABLE 1. MODEL COMPONENT FACTOR SCALE NAMES AND DESCRIPTIONS

TRADSTU	***Traditional Student***: Under 20 Yrs Old/Unmarried/Immediate from High School
ADVANTGD	***Socially/Educationally Advantaged Background***: White/High Income, Job Status, College-Educated Home Neighborhood*/Prestige County H.S. Graduate**
REGOBJ	***Regular College Objectives***: Transfer Program/A&S Program/Stated 4-Yr Transfer Motive/Stated Degree PGCC Goal/No Stated Enrichment or Occupational Motive
ATTITUDE	***Implied Study Motivation & Success Commitment***: Combined Day-Evening or Campus-Extension Center Attendance/Summer Attendance/Study Major Shift/No "Stopping Out"/Enrolled All 3 Earliest Major Terms
SUPPORT	***Institutional Financial & Academic Support***: Pell Grants Received/Minority Retention Program /Student Services/ Job Planning or Study Technique Courses
PREPARED	***College Preparedness and Remediation Progress***: High Basic Skills Placement Test Scores/# Dev. Requirements (-)/Completed Dev. Program/No Dev. Math Requirement
LAUNCH	***Early Term Survival and Progress***: Enrolled 3 Earliest Major Terms/Yr-1 Good Standing/ 10+ Credits Yr-1/Post-Fall-1 Enrollment/Any Yr-1 Credits/Yr-1 GPA
EFFORT	***Term Study Load***: Mean Yr-1 Course Hour Attempts/Mean Major Term Course Hour Load/Fall-1 Course Hour Load 15+
PERFORM	***Course Performance and Academic Status***: Yr-1 Cum GPA/Final Cum GPA/ Earned-to-Attempted Hours Ratio/Always in Good Standing/# Good Standing Terms
PERSIST	***Attendance Persistence and Continuity***: Attendance Span/# Major Terms/Post-Yr-1 Enrollment/Post-Fall1 Enrollment/10+ Credits Earned/No "Stopping Out"
PROBLEMS	***Patterns of Remediation Difficulties and Stalled Academic Progress***: # Dev. Areas/Yr-1 Dev. Course-Taking/Dev. Course Repeating/Academic Restriction or Probation /No Credit Courses/No Credit Course Passing/Dev. Math Incomplete

* Derived from student 1990 Census Tract data **From a prestige ranking of area high-schools by a panel of PGCC staff

[3]SPSS factor module: principle components extraction method, .1 minimum Eigenvalue extraction criterion, oblique rotation to conserve dimensional intercorrelation, regression-based case scores.

As the table makes clear, for the most part our factor analysis of academic background and process variables rounded up the usual suspects, but the unexpected emergence of three factors deserves special comment:[4] First, variables measuring non-normative course scheduling (taking both day and evening classes, taking both main campus and extension center classes, and attending both major and summer terms), midstream change in program curriculum, and strict sequential term enrollment (no "stopping-out") combined to define a separate factor (ATTITUDE). We interpreted the resulting scale as a gauge of student commitment to academic success, because each of the defining variables, in its own way, seemed to imply extra effort, determination or attention to study goals. As we shall see, this turned out to be a key component of the overall causal matrix.

Second, a group of attendance and performance variables specific to the three earliest major semesters, instead of factoring in with other attendance and performance variables, coalesced into a separate factor measuring initial study survival and success (LAUNCH). This suggests that the first year of study has its own dynamic which may be critical to ultimate success or failure.

Lastly, the factor analysis detected a substantive interaction among certain developmental- and credit course-related variables (PROBLEMS). It would seem that some combination of the number and types of remediation required, absence of remedial progress, and subsequent difficulties in entering credit courses and accumulating credit hours is a common enough pattern in the working out of the academic process at PGCC to constitute an independent phenomenon.

[4]For a complete treatment of the original predictors and the derivation of the factor scales, see Boughan (1997).

Findings from Path Analysis. Our final path analytic model, developed after much trial and error, is graphically depicted in Figure 2, below, as a mapping of the causal network making up PGCC's academic process.[5] It shows the 11 predictor variables distributed in rough terms of temporal, logical and structural distance from the achievement classifier and from one another. The causal flow works downwards towards the bottom of the diagram, with many lateral links in between. The diagram indicates by means of arrows the existence and direction of causal paths linking variable pairs. Each arrow is shown with its associated path coefficient (p), a probability weight measuring the impact of the first on the second variable, controlling for all causally preceding variables. Thick arrows indicate a moderate to strong link ($p \geq .10$) while fine arrows show marginal relationships (.05 - .09). Since path coefficients are *discrete* probability weights, absolute p-values for a sequence of paths can be summed, and their total (P_t) can be used in a rough and ready way as a measure of the probability weight of the entire "trail."

Our path model result in a wealth of insights concerning local areas of academic process function (e.g., the high positive impact of institutional support on study load: p=.25), but space permits only an overview of the major features of the model:

■ The total path model explained almost half of the achievement variance (R^2=.47). This suggests that the model's ability to portray just how process vectors impact on this final key component is reasonably good. Technically, however, this coefficient of determination statistic only estimates the model's predictiveness at a single, albeit very important, node; it does not measure overall model performance or *goodness-of-fit*. For path analysis, this involves tests of numerous aspects of model operation, not all of which our model passed; in general, however, our model performed acceptably within key diagnostic parameters.[6]

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[5]For model development we used AMOS v. 3.6 software. All AMOS models are fully saturated; latent variables and covariance estimates were calculated but are not shown in Figure 2 to preserve clarity.

[6] E.g., one measure judged our model just outside technical acceptability (CMIN/DF=8.319, 5=cut-off), but another implied excellent fit (GFI=.988, 1=perfect), and a third very favorably compared path results with straight regression results (perfect CMIN=0, path CMIN=175, regression CMIN=7369), a good practical test.

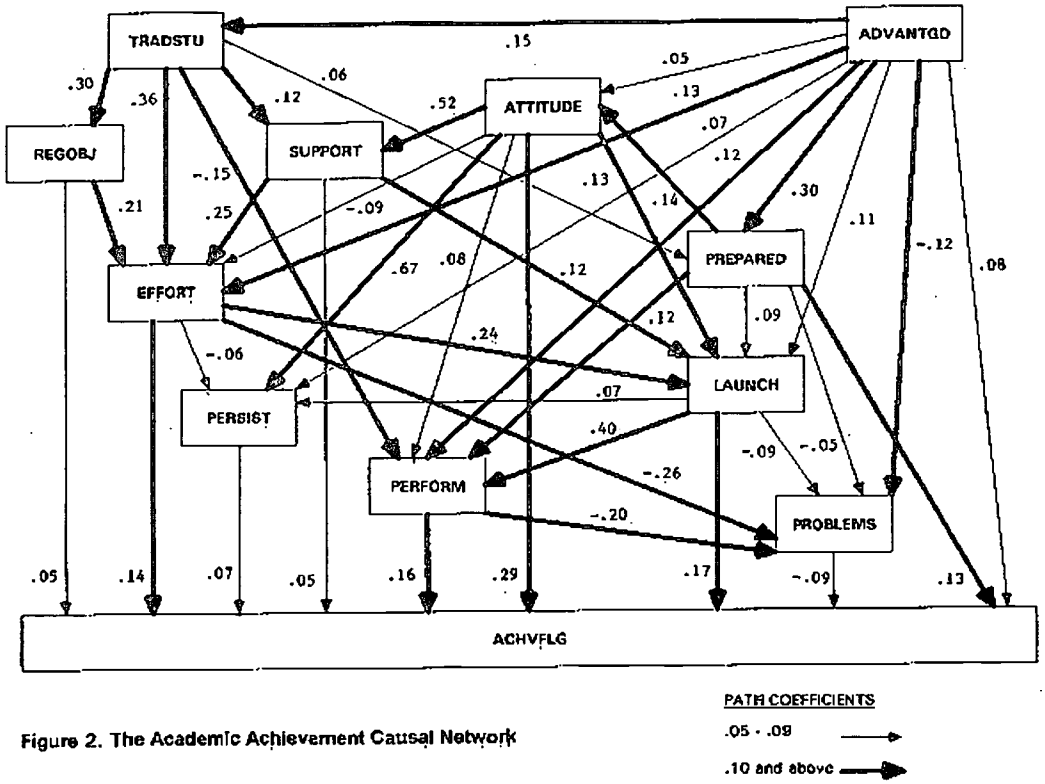

Figure 2. The Academic Achievement Causal Network

■ A central feature of the path diagram turned out to be the existence of two semi-independent "trails" (sequences of paths), of almost equal probability weight, leading to Achiever Classification. The first was the "*Effort Trail*" which linked the following in rough causal sequence: "traditional student" attributes (young, single, immediate from high school), transfer program orientation, level of institutional support, typical term study load, and attendance persistence (P_t=1.56). The second was a broad "*Performance Trail*" of student socio-educational attributes (race, social class, quality of high school experience), college preparation level and remedial need, early term survival and progress, course performance, and academic problem syndromes (P_t=1.58). These may be compared with the whole model path sum (7.06).

■ Another prominent feature of the path model was a busy junction of paths with study motivation level (ATTITUDE) at its center. Moderate-to-strong paths ran from it to Achiever Classification and to virtually all nodes along the Effort and Performance trails. The centrality of study motivation in student achievement, as represented by its strategic positioning in the model and its very high total probability weight (P_t=1.83), was perhaps the single most important finding of this study.[7]

[7]The central role played by personal attitude factors in academic performance was also the finding of another academic process path analysis, although method (survey research), and model elements (GPA as performance measure; multiple motivation variables) and base (four-year university students) differed significantly from ours. See Cubeta, Scheckley and Travers (1997).

■ Other key findings were the importance of early term survival and progress (LAUNCH), a prime node of the Performance Trail, and the significant role student services (SUPPORT) was shown playing in conditioning both Launch Period outcomes and study load (EFFORT). These two findings have major implications for academic policy.

■ Finally, in this brief review, we should mention how the model depicted the specific way student background variables operated in the overall causal network conditioning student outcomes. Past research on the correlates of academic achievement often found student background factors like race and socio-economic status as having little impact on college success. The path analysis model, however, suggests that these low achievement correlations may have been a methodological artifact—the restriction of the analysis to *direct effects*. Situated at the "head" of the Performance Trail, the factor scale summarizing various forms of socio-educational advantage (ADVANTGD) showed strongly *local* predictive power (P_t=1.13 with all impacted variables), especially affecting level of college preparation; and the measure of "traditional student" attributes (TRADSTU), beginning the Effort Trail, proved to have a good deal to do with program orientation, level of institutional support, and study load (P_t=.99).

Findings from Cluster Analysis. As already discussed, the last part of our research involved using cluster analysis to capture the actual study career patterns resulting from the academic process at PGCC. To assure that only student behavior would define career types, socio-educational background variables ADVANTGD and TRADSTU were dropped and data elements restricted to the 9 pure academic process factor scales. To these data we applied the *k-means* form of cluster analysis, which calculates the mathematically optimum case sort for a specified number of group breaks, and examined cluster solutions 5 through 15. The 10-fold solution was found best in satisfying our two key evaluation criteria—high realism of emergent student career types and high articulation of types with achievement level. The student career types were easy to interpret through an examination of the pattern of each cluster's defining mean factor scores, and to tag with summary characterizations in the form of cluster "nicknames."

Furthermore, the Eta^2 correlation[8] between student career type and achiever classification with the former as the predictor came in at a robust .381. Table 2, below, embodies the model. The table displays the 10 student career clusters, labeled by nickname, in percent Achiever order. The data columns display cluster means for the original 9 process variables used in the sort, indexed to the overall cohort averages to make cross-scale and cluster comparisons easier. Also shown are indexed cluster achievement tendencies by main classifier and achievement sub-types, plus indexed scores for TRADSTU and ADVANTGD to identify the socio-educational backgrounds predominating within each career type. The cluster model is rich in detail,[9] but again, space limitation permits only a general review:

[8] Eta^2 is the appropriate statistic for gauging how much of the variance of a two-category variable can be explained by placement within a typology; it is highly analogous to the R^2 statistic used in linear models like regression and causal path analysis.

[9] See Boughan (1997), for a full report of the cluster model.

Table 2. Student Career Clusters within Cohort 1990 (Achievement Eta^2=.381)

Factors	(Raw)	Student Career Clusters (Index Values)									
	COHORT	EXTRA EFFORT	SUPPORTED SCHOLARS	COLLEGIATES	TRUE GRIT	PRAGMA-TISTS	FULL-TIME STRUGGLE	PART-TIME STRUGGLE	VANISHERS	UNPREPARED	CASUALS
Cluster % Cluster (N)	100.0 (2,386)	9.8 (233)	6.6 (158)	14.3 (342)	9.9 (236)	4.4 (106)	5.6 (134)	10.6 (254)	7.0 (168)	15.5 (369)	16.2 (386)
REGOBJ	*50.0*	110	113	126	109	63	100	58	115	98	92
PREPARED	*50.0*	120	119	129	114	79	91	90	105	30	127
LAUNCH	*50.0*	126	137	155	80	117	102	116	54	74	62
	50.0	174	132	87	154	83	109	106	68	68	63
ATTITUDE	*50.0*	93	222	86	91	88	210	81	82	81	75
SUPPORT	*50.0*	127	144	150	84	105	117	49	138	107	66
	50.0	162	117	92	159	99	107	125	64	73	50
EFFORT	*50.0*	126	131	130	94	131	87	126	125	61	61
PERSIST	*50.0*	58	71	67	137	57	170	120	61	140	97
PERFORM											
PROBLEMS											
ACHIEVER	31.2	242	219	212	139	97	79	56	36	3	2
Transfers	13.4	202	208	325	89	63	44	21	36	2	4
Awards	8.6	340	253	122	172	121	43	55	14	0	0
Trs. or Awds.	18.9	244	217	254	123	89	47	35	28	2	3
Soph Status	12.3	237	221	145	163	107	128	85	49	4	0
Continuing	9.8	118	52	54	264	67	132	177	55	66	29
Dropout	63.7	36	48	51	67	107	103	114	135	146	152
ADVANTD	*50.0*	126	90	121	94	108	64	102	106	75	102
TRADSTU	*50.0*	114	107	123	97	81	109	63	109	107	86

NOTE: In the Student Career columns, all figures are indexed group means (Index=100*(raw group mean/raw whole population mean)). In the Whole Cohort column, unitalicized figures are percentages of all cohort students in the variable criterion category; figures in italics (e.g. *50.0*) are transformed factor scale score means. In their original format, factor score whole population means are always 0, with scores below the mean indicated by negative numbers. This format does not permit indexing because indexing requires division by the population mean and mathematics forbids zero division. The transformation formula (Index=50+(20*cluster score mean)) resets the population factor mean to 50, with a constant multiplier (20) which has the effect of creating a factor score case range of between 0 and 100.

■ *High Achievement Clusters (60 % or more).* Three student clusters registered high achievement levels. All had in common elevated group preparedness, academic goal, launch period success, course performance and study load scores, and low cumulative problem scores, but each distinguished itself in some salient fashion. The **Collegiate** cluster was special for its below-average PERSIST and ATTITUDE scores; it contained the highest concentration of full-time "traditional students" (the youngest and most straight-from-high-school group), most strongly favored transfer programs, especially in the Arts & Sciences, and had the highest transfer rate (especially early and without a degree). In contrast, **Extra Effort** students registered extreme PERSIST and ATTITUDE scores and exhibited strong *degree*-seeking behavior. While also inclined to be "traditional students," nevertheless many were a bit older, entered PGCC on a somewhat delayed basis, often took evening and extension center classes, and tended more to favor technical programs like computer programming and allied health. The PERSIST and ATTITUDE scores of the **Supported Scholars** fell somewhere between those of the first two. These were mostly strongly motivated African American "traditional students" from the middle socio-educational ranks, while Collegiates and Extra Effort students were mostly white and upper-middle class. Most notably, students with this academic career pattern were the likeliest of any to bolster their study success chances by participating in institutional support programs.

■ *High Medium Achievement Clusters (40-59%).* At this level of achievement we found only one study career pattern—**True Grit**. Many in this essentially African American middle class cluster of older students, often part-timers taking evening classes, experienced significant problems with remedial programs and credit courses, but over two-fifths eventually became achievers through drive (second highest ATTITUDE score) and pluck (second highest PERSIST score).

■ *Average Achievement Clusters (20-39 %).* Two unlike clusters occupied this niche. The somewhat more successful **Pragmatists**, like True Grit students, tended to be middle class adult learners, but were predominantly white, much older, more part-time (fourth lowest EFFORT score), and more oriented to occupational courses and job-related goals (second lowest REGOBJ score). Most arrived at PGCC poorly prepared, but nevertheless did well academically as a group (tied for highest PERFORM score). Their only moderate group PERSIST score and 30 percent achievement rate may be related to a prevalence of short-term occupational objectives for attendance. In contrast, **Full-Time Strugglers** were mostly young working class African American full-time students straight from lower prestige high schools. These entered PGCC somewhat unprepared, exhibited only moderate drive and persistence, and then typically bogged down in the remediation process (highest group PROBLEMS score). Despite a strong tendency to avail themselves of support programs (second highest SUPPORT score), only around a quarter became Achievers by their last term.

■ *Low Achievement Clusters (Under 20%).* Four disparate study career types were found in this category. **Part-Time Strugglers**, mostly African American, were fully-employed, delayed-entry, part-time students (lowest TRADSTU score) with clear job-related attendance objectives (lowest REGOBJ score). Below average college preparation, low study loads and high "stop-out" tendencies prevented any more than one in five becoming Achievers, despite high PERSIST scores (third best mean). **Vanishers**, on the other hand, were predominantly white, degree- and transfer-oriented full-time students with excellent initial course performance records. Nevertheless, most of them dropped out within a few terms (second lowest PERSIST score)—as if study had been cut short by some personal emergency like ill-health or financial collapse. Hardly more than one in ten made it into the Achiever category. Much less mysterious were the **Unprepareds**, who arrived at PGCC with the greatest remediation needs of any cluster; most of the students in this working class African American group did not survive the first year of study (57 percent never earned a single credit hour), and less than 1 percent became Achievers. Lastly in this bottom achievement tier were the **Casuals**, mostly well-prepared, part-time students from middle and upper-middle class neighborhoods, many explicitly giving job and personal enrichment reasons for attending, who took very few courses and exerted little effort to get good grades in those they did take. Again, less than 1 percent became Achievers.

The cluster model taught three main lessons. First, our top performing students were *not* necessarily socially and educationally advantaged transfer-bound "traditional students" (the equivalent of the Collegiate cluster). Two other high success clusters emerged, one consisting mainly of evening students and the another of lower-middle class African Americans, both more oriented toward degree-seeking than transferring. Second, a goodly proportion of our cohort member actually fell outside the regular parameters of college study. Around 7 percent "vanished" in the midst of successful study careers, probably due to personal emergencies, and fully 16 percent proved to be "casual" course-takers, not serious about pursuing a degree or transfer. Third, another 16 percent (Unprepareds) proved so unready for college work that they were beyond the best efforts of our developmental teachers and counselors to help in any real way. And fourth, among clusters with high concentrations of the socio-educationally disadvantaged, adult learners, part-time and job-oriented students, those who accomplished the most academically had in their study career profiles high scores on either level of personal motivation or level of financial/academic support receipt or both. Sheer attendance persistence, often present, did not seem to be enough.

Conclusions. Although works-in-progress, even in unfinished form our path and cluster analyses managed to yield many important if tentative findings. Path analysis revealed the critical importance of personal motivation and the Launch Period in conditioning achievement probabilities. And cluster analysis highlighted the inherent diversity of motives, needs and academic experiences within community college student bodies and the importance of taking student career differences seriously. Particularly gratifying to us is how these core findings validated the wisdom of recent steps taken by

Prince George's Community College to establish academic support programs which reach students early in their careers at PGCC, were designed to build confidence and esprit as well as develop academic skills, and which could be customized to reflect individual educational needs and objectives. On the research side, however, much work still needs to be done. In our future efforts, we intend to fill large gaps in the social and educational background data by carrying out entrant surveys of newly formed tracking cohorts, and to increase the richness and accuracy of our academic outcomes measure by means of exiter surveys.

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PARENTAL INCOME AND STUDENTS' COLLEGE CHOICE PROCESS: RESEARCH FINDINGS TO GUIDE RECRUITMENT STRATEGIES

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Introduction

Purpose. The purpose of this paper is to present the design and results from a research study that examined the relationship between parental income and students' college choice process. Major research questions addressed in the study include the following: How does the importance of college characteristics to students' choice vary by parental income? Do students' images of the college they choose to attend vary by income? What other factors influence the enrollment decisions of students from different income levels? What model would best predict the college choice of students in different income levels?

A primary rationale underlying this study is that successful recruitment of any student segment requires an understanding of what factors influence these students' college choice. Further, with increasingly limited financial aid budgets, many institutions need information to enhance their ability to recruit students able to pay their own college costs. Results from this study have been used to inform recruitment processes both for students eligible for financial aid and for students whose families are able to assume the full financial responsibility for their college education.

Review of the Literature. Research conducted over the last several decades provides both a conceptual framework and an empirical basis for identifying individual and institutional factors that influence students' college choice. Offering a relevant conceptual framework, Hossler and Gallagher (1987) propose a three stage model of college choice: the first, predisposition stage is one in which familial, societal and economic factors generate interest and attitudes conducive to college enrollment; the second, search phase occurs when college bound students proactively explore potential institutional options or choice sets and evaluate their academic and financial capabilities in relation to these potential choices; and the third and final stage is one in which students make their final selection from available options. The present study focuses on the third stage and concentrates primarily on the effect of parental income on students' final college choice.

Socioeconomic variables - parental education levels, parental occupations, and family income - have been found to be strongly related to college choice (Hearn 1984, 1988). Research from the 1960's to the present documents the effect of family income on students' college choice. An early study, based on a comparative socioeconomic analysis of 18,378 prospective college students, found that students from higher income homes

were more likely to have given major consideration to the social opportunities available, and they were also relatively more concerned with developing their intellect while students from less affluent homes were more concerned with vocational and professional training (Baird, 1967). Later, based on statistical analyses of the collegiate options considered by more than one-half million high school seniors in the eastern third of the nation, Zemsky and Oedel (1983) concluded that, "... the patterns of college choice are stitched deeply into the social and economic fabric of the nation" (p. 44). Further, Flint (1992) reported that, "Of the background characteristics, father's education and family income exhibit the strongest effects, such that higher levels of education or family income are associated with higher levels of selectivity, degree offerings, and greater distance from home" (pp. 702-703).

Data Source. Results presented in this paper are based on responses to the Admitted Student Questionnaire, administered to 1065 students accepted for the Fall 1996 Entering Freshman Class at a selective, private college in the northeast. Some 54 percent of the accepted student population, 83 percent of the enrolling and 38 percent of the non-enrolling students, responded to the survey. Based on 1995 parental or guardian income before taxes, students are classified in two income categories. Those who reported parental incomes of $100,000 or higher are classified in the higher income category and those who reported parental incomes less than $100,000 are classified in the lower income category.

Limitations of the Data. It is important to recognize the inherent limitations of the data on which this study is based. First, the source of data for this research is based only on the responses from one institution's accepted freshman class. Further, substantially different response rates, 83 and 38 percent respectively, were obtained for the enrolling and non-enrolling students. Although weighting was used to adjust for the differential response rates, differences of this magnitude increase the possibility that some statistics may not approximate the true figures.

Second, the income categories on the Admitted Student Questionnaire provided for limited variation at the higher income levels; all incomes of $100,000 or higher were included in one category. Future studies might specify more differentiation at the higher income levels; increase the response rates for non-enrolling students; and include other variables that offer additional explanatory power in predicting students' enrollment decision. This study might be viewed as the first in a series of studies to be replicated with a larger sample of institutions.

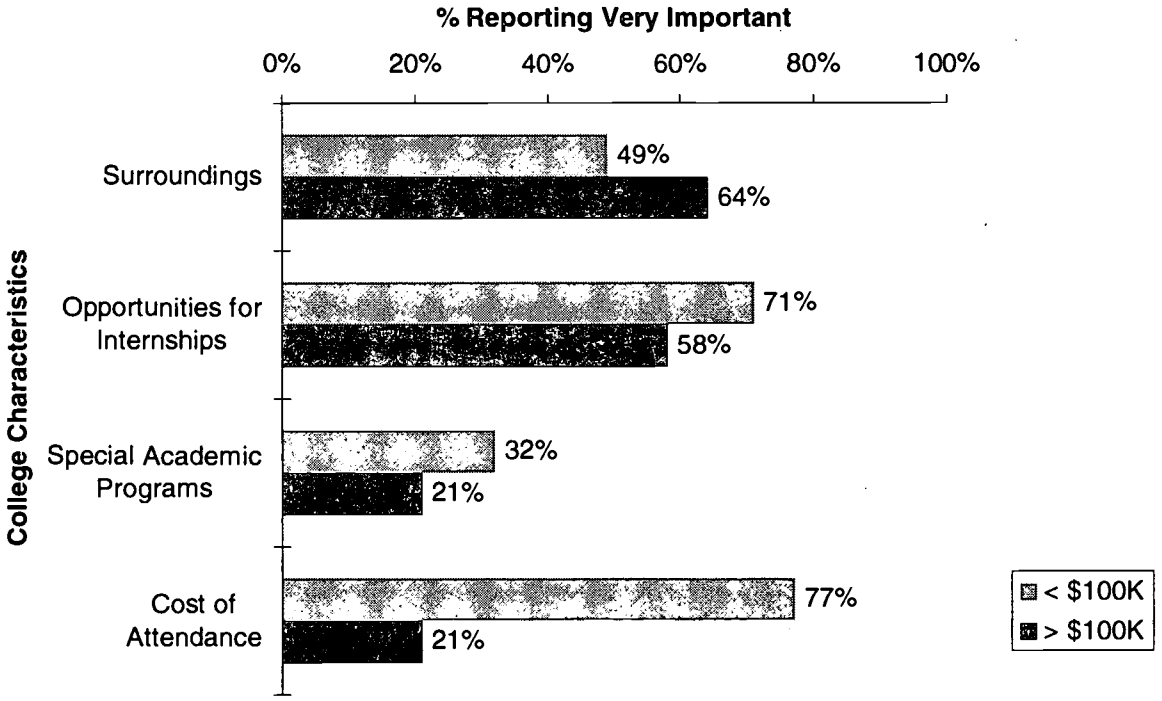
Analytical Techniques. Both bivariate and multivariate statistical techniques, including chi-square and correlation analyses, analysis of variance and discriminant analysis were employed in the analyses of the data. Analyses were conducted with individual questionnaire items and computed scales. These scales were created to simplify the data and to establish reliable, summary measures of students' responses, specifically regarding their ratings of college characteristics and college images.

Results

Income Variation in the Importance of College Characteristics

Analyses, comparing higher and lower income students' perceptions regarding the importance of various college characteristics were conducted for sixteen specified college characteristics. These characteristics relate to academic, social, lifestyle and financial aspects of a college that students might consider. Statistically significant differences were found for four of the 16 characteristics. Results are graphically displayed in Figure 1.

Figure 1. The Importance of College Characteristics by Parental Income



As shown in Figure 1, compared with students from lower income families, students from higher income families attribute significantly more importance to the college's surroundings, i.e. the neighborhood, town or city in which the institution is located ($X^2 = 20.92$, p= .001). Some 64 percent of the higher income students, compared with only 49 percent of the students in the lower income category, identified surroundings as very important to their college choice. In contrast, students from the lower income families attribute more importance to opportunities for internships ($X^2 = 24.21$, p= .001); 71 percent of these students, compared with 58 percent of the students in the higher income category, identified opportunities for internships as very important to their college choice.

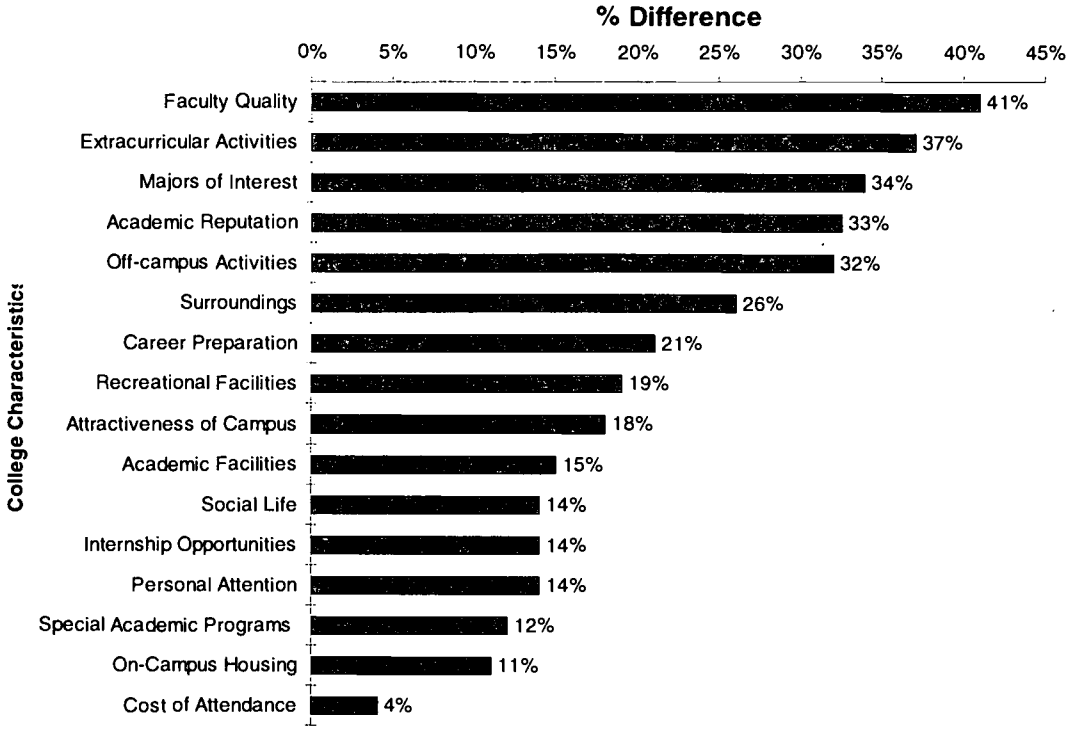
Students in the lower income category also attribute somewhat more importance to the academic programs available to them at a given college ($X^2 = 12.14$, p= .01). Some 32 percent of the students in the lower income category, compared with only 21 percent of those in the higher income category, identified special academic programs as very important to their college choice. Finally, as expected, students from families in the lower income category express significantly greater concern about the cost of attendance at a particular college ($X^2 = 271.64$, p= .001); 77 percent of the students in the lower income category, compared with only 21 percent of those in the higher income category, identified cost of attendance as very important to their college choice.

Differences in Ratings of College Characteristics

Since students' perspective on the characteristics of a given college also exert a potentially significant affect on their college choice, this study included a comparative analysis of the differences in 'Excellent' ratings between higher and lower income, enrolling and non-enrolling students on specific college characteristics.

Higher Income Students. Figure 2 presents a distribution of percent differences between higher income, enrolling and non-enrolling students. These data identify aspects of the college that might be strengthened or featured more prominently to recruit more higher income students. As shown, characteristics with the largest percent differences between higher income, enrolling and non-enrolling students relate both to the academic prestige of the college and the campus social life. For example, compared with higher income non-enrolling students, 41 percent more of the enrolling students rate the college 'Excellent' for the quality of faculty and 33 percent more rate the college 'Excellent' on academic reputation. Some 37 and 32 percent more respectively of the enrolling students rate the college 'Excellent' on extracurricular activities and off-campus activities, and 34 percent more of the enrolling students also rate the college 'Excellent' on majors of interest. These data support a strategy to focus more intensively on favorably influencing higher income students' perception of the college's academic reputation, the quality of the faculty, majors of interest, and opportunities for extracurricular and off-campus activities.

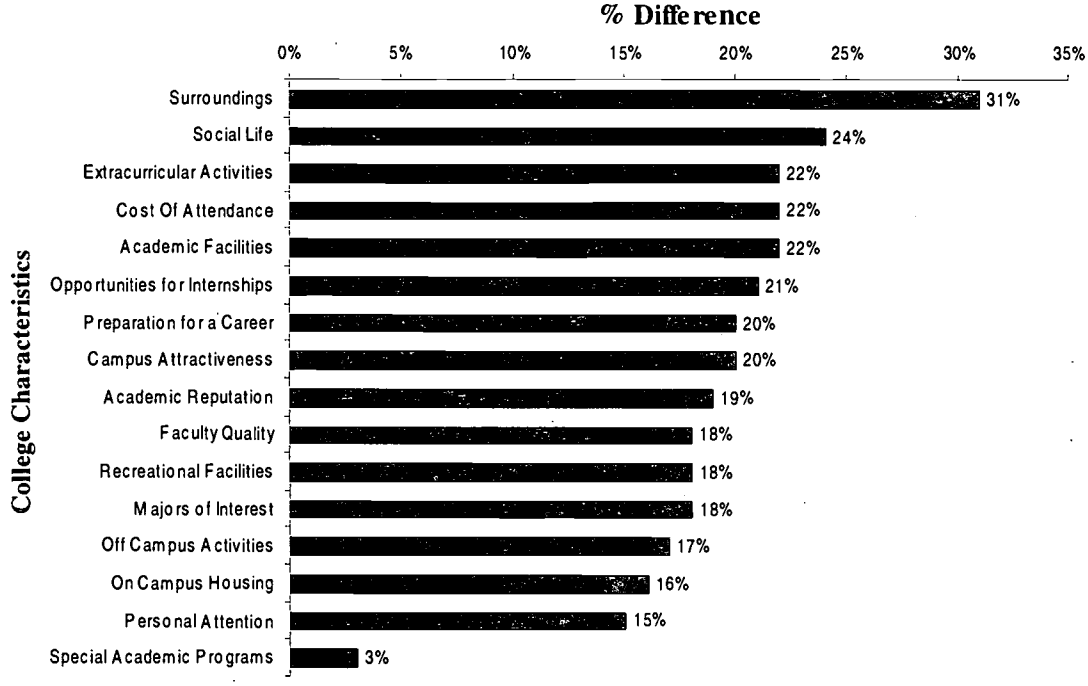
Figure 2. Percent Differences between Higher Income, Enrolling and Non-Enrolling Students on Excellent Ratings for College Characteristics



Lower Income Students. Figure 3 displays the college characteristics with the largest percent differences in 'Excellent' ratings for the lower income students. As shown, these include the college's surroundings (31%), the quality of social life (24%), the opportunity for extracurricular activities (22%), cost of attendance (22%) and academic facilities (22%). Compared with lower income, non-enrolling students, the enrolling students perceive the college more positively on these dimensions.

Comparative analysis of the data presented in Figures 2 and 3 reveals that higher and lower income students differ with respect to the most differentiating characteristics between enrolling and non-enrolling students. Among higher income students, faculty quality, majors of interest and academic reputation are the most differentiating characteristics. In contrast, among lower income accepted students, college surroundings, social life and the cost of attendance are the most differentiating characteristics. These findings provide a basis for developing unique recruitment strategies for students in different income categories.

Figure 3. Percent Differences between Lower Income, Enrolling and Non-Enrolling Students on Excellent Ratings for College Characteristics



Income Variation on the College Characteristics Rating Scales

As noted in the introduction, in addition to item level analyses, statistical tests were also conducted using computed scales. The College Characteristic Rating scales employed in this study represent students' average ratings on two different dimensions of the college, the academic and social life. The Campus Environment and Social Life scale, with a reliability of .83, represents students' mean ratings on the college's surroundings, academic and recreational facilities, on-campus housing, attractiveness of the campus, opportunities to participate in extracurricular activities, quality of social life and access to off campus cultural and recreational opportunities. The Quality of Education and Professional Preparation scale, with a reliability of .81, represents students' mean ratings on several items including academic reputation, quality of the faculty, personal attention, availability of special academic programs, opportunities for internships, and preparation for a career.

Table 1 displays higher and lower income, enrolling and non-enrolling students' mean scores on the college characteristic rating scales. As shown, analysis of variance identified significant differences by income and enrollment status in students' ratings on these scales. On the Quality of Education and Professional Preparation scale, the mean scores for enrolled students in both income categories are very close, 3.74 for the lower income category and 3.72 for the higher income group, while the mean scores of the non-enrolled students are somewhat lower, 3.51 for the lower income category and 3.42 for

the higher income category. Mean scores on the Campus Environment and Social Life scale are also positive ranging from 3.52 reported by enrolling students in the lower income category to 3.10 reported by non-enrolling students in the higher income category.

Table 1. Variation by Income and Enrollment Status in Students' Mean Scores on the College Characteristics Rating Scales

A. Quality of Education and Professional Preparation Scale

Income Level	Enrolled Students	Non- Enrolled Students	F-Ratio
$100,000 or Higher	3.72	3.42	24.22***
	(.32)	(.44)	
Less than $100,000	3.74	3.51	
	(.31)	(.48)	
(N=818)			

B. Campus Environment and Social Life Scale

Income Level	Enrolled Students	Non- Enrolled Students	F-Ratio
$100,000 or Higher	3.48	3.10	36.53***
	(.40)	(.51)	
Less than $100,000	3.52	3.18	
	(.36)	(.53)	
(N=811)			

*** $p \leq .001$

Notes: The number in parenthesis is the standard deviation.

Differences between Enrolling and Non-Enrolling Students' Images of the College

Higher Income Students. Statistical analysis identified significant differences between higher income, enrolling and non-enrolling students with respect to eight of 19 specified college images. Compared with non-enrolling students, 27 percent more of the enrolling students think the college is regarded as challenging and 24 percent more of the enrolling students think the college is considered to be prestigious. In contrast, compared with the enrolling students, 16 percent more of the non-enrolling students think the college is perceived as isolated and 11 percent more think the college is not well known.

Lower Income Students. Similar to the pattern found among higher income students, compared with the non-enrolling students, 16, 25 and 12 percent more respectively of the lower income, enrolling students perceived the college as a challenging, prestigious and highly respected institution. In contrast with the data for higher income students, 26 percent more of the lower income enrolling students, compared with the non-enrolling students, perceived the college as a friendly place.

Variation by Income on the College Images Scales

Two scales were created to reflect students' images of the college. The first scale, Academic Prestige, represents the extent to which students think the college is challenging, prestigious, intellectual, selective, highly respected, well known, national, not average and not a back-up school. The reliability for this scale is moderately strong, .73. The second, Social Image scale represents the extent to which students perceive the college as a friendly, comfortable, athletic, fun, partying and a spirit school. The reliability for this scale is only moderate, .64. Table 2 presents mean scores on both image scales for enrolling and non-enrolling students in the higher and lower income categories. These means are based on a scale from 0 to 1.

Table 2. Variation by Family Income and Enrollment Status in Students' Images of the College

A. Academic Prestige Scale

Income Level	Enrolled Students	Non- Enrolled Students	F-Ratio
$100,000 or Higher	.68	.56	18.17***
	(.20)	(.23)	
Less than $100,000	.74	.64	
	(.20)	(.26)	
(N=868)			

B. Social Image Scale

Income Level	Enrolled Students	Non- Enrolled Students	F-Ratio
$100,000 or Higher	.28	.18	30.43***
	(.24)	(.18)	
Less than $100,000	.34	.16	
	(.27)	(.21)	
(N=868)			

*** $p \leq .001$

Notes: The number in parenthesis is the standard deviation.

As shown in Table 2, all of the means on the Academic Prestige scale are .50 or higher, indicating that students in all groups generally have a positive perception of the college's academic image. However, analysis of variance did reveal statistically significant differences among these student groups. Enrolling students in the lower income category report the highest mean of .74 while non-enrolling students in the higher income category report the lowest mean of .56. Compared with the means on the Academic Prestige scale, those on the Social Image scale are substantially lower. All of these means are below .5, indicating that students generally have a less than positive perception of the college's social image. Enrolling students in the lower income category report the highest mean of .34 while non-enrolling students in the higher income category report the lowest mean of .18.

Predicting Accepted Students' Enrollment Decision

Higher Income Students. Based on results from bivariate analyses, the following five variables were selected as potential predictors in a discriminant analysis for high income students: the College Campus Environment and Social Life Rating Scale; the Quality of Education and Professional Preparation Rating Scale; Students' Average High School Grades; SAT Verbal Scores; and Ratings of the College on Majors of Interest.

Table 3 identifies those variables that proved to be significant predictors of higher income students' enrollment status. The discriminant function coefficients reflect the relative weight of the predictors on students' enrollment decision. As shown, results from the discriminant analysis revealed that higher income students were significantly more likely to enroll if they rated the college more positively on the Campus Environment and Social Life Rating Scale; reported relatively lower high school grades; attained relatively lower SAT Verbal scores; and rated the college more positively on majors of interest. Students' ratings on the Campus Environment and Social Life scale clearly had the strongest effect on enrollment status. The discriminant function, including these four variables, accurately predicted the enrollment decision of 80 percent of the respondents. The canonical correlation of .63 indicates that this function explains 40 percent of the variance in higher income, accepted students' enrollment decision.

Table 3. Discriminant Analysis Results: Predicting Higher Income Accepted Students' Enrollment Decision

Predictors	Standardized Discriminant Function Coefficients	Percent Correctly Classified
Campus Environment and Social Life	.59	80%
Average High School Grades	-.51	
SAT Verbal Scores	-.32	
Rating on Majors of Interest	.45	
Canonical Correlation	.64	$X^2 = 132.90; df=4; p \leq .001$

Lower Income Students. Table 4 identifies those variables that proved to be significant predictors of lower income students' enrollment status. In contrast with the model for high income students, cost of attendance emerges as the strongest predictor of enrollment status among lower income students. Three additional variables, significant predictors for both groups, include: students' average high school grades, SAT verbal scores and rating of the campus environment and social life. As shown in Table 4, the four variable model accurately predicts the enrollment decision of 79 percent of the lower income accepted students. The canonical correlation of .55 indicates that this model explains 30 percent of the variance in lower income, accepted students' college choice. Students in the lower income category were much more likely to enroll if they rated the college positively on cost and on the campus environment and social life.

Table 4. Discriminant Analysis Results: Predicting Lower Income Accepted Students' Enrollment Decision

Predictors	Standardized Discriminant Function Coefficients	Percent Correctly Classified
Cost of Attendance	.78	79%
Campus Environment and Social Life	.59	
SAT Verbal Scores	-.28	
Average High School Grades	-.27	
Canonical Correlation	.55	X^2=258.05;df=4; p≤.001

Discussion

Importance of College Characteristics. Results from this research indicate that students from higher income families are relatively more concerned about the lifestyle they will enjoy during their college experience. For example, compared with students from the lower income families, students from higher income families attribute more importance to the college's surroundings, i.e. the neighborhood, town or city in which the institution is located. In contrast, students from the lower income families attribute significantly more importance to the cost of attendance and to opportunities for internships.

Ratings of College Characteristics. Comparative analyses revealed some significant differences between higher income, enrolling and non-enrolling students' ratings on characteristics of the specific college to which they were accepted. The data showed that higher income students considered academic as well as social factors when rating the specific college. Compared with higher income non-enrolling students, at least 30 percent more of the enrolling students rated the college 'Excellent' for the quality of faculty, the academic reputation, extracurricular activities, off-campus activities, and majors of interest. Among lower income students, a substantially higher percent of the enrolling students, compared with the non-enrolling students, rated the college more positively on the

college's surroundings and social life. These differences suggest the potential value of designing unique recruitment efforts to influence both higher and lower income, accepted students' perception of these college characteristics.

Differences in Images of the College. Comparative analyses also revealed some differences between enrolling and non-enrolling students' images of the college. Among higher income students, the most discriminating variables were challenging and prestigious; more of the enrolling students perceived the college in terms of these images. However, among lower income students, the most discriminating variable was 'friendly', with substantially more of the enrolling students perceiving the college as a friendly place.

Findings from this study confirm results from previous research documenting a significant relationship between parental income and students' college choice (Zemsky & Oedel, 1983; Flint, 1992). The results support Baird's (1967) earlier finding that students from higher income homes are more likely to give major consideration to the social opportunities available while lower income students are more concerned about how the college will prepare them for a career. Further, this study demonstrates how institutional research can be used to expand institutional horizons by informing the development of unique recruitment strategies for special student segments. Recommendations emanating from this study encouraged administrators to improve the vibrancy of the college's actual and perceived social life; to develop collaborative programs with other colleges; to intensify efforts to promote the image of the college as prestigious and selective; and to build on the college's strength by increasing contact between prospective students and faculty members as well as graduates.

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MANAGING RESISTANCE IN THE ORGANIZATIONAL CHANGE PROCESS

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Higher Education Data Sharing Consortium

"Change" is a common thread among college campuses nationwide. Not a single campus constituency, be it students, governing boards, faculty, administrators or presidents, are left unscathed by the increasing internal and external forces of change. Internally, institutions of higher education must attempt to accommodate students' demands for improved service, faculty's desires for increased academic freedom, and trustees' calls for fiscal accountability, just to name a few. Examples of external pressures include the demands of the changing market of prospective students, as well as the constantly evolving governmental and accreditation board guidelines. It is apparent that many of these internal and external drivers of change are potentially in conflict, and in some cases one constituency must lose so that another may gain. While an institution may choose to temporarily resist the forces of change, survival may eventually rely on an institution's collective ability to adapt.

One of the main hurdles change agents face is the resistance of one or more groups to the change process. Resistance itself is two-fold. Groups being acted upon by those in a position of legitimate authority may have reactions to change ranging from casual inattention to the change process to organized protests. It is usually only the more vocal reactions, which draw obvious attention to an in individual's or group's adversity, that have the capability to block, even if only temporarily, the change process. On the other hand, those in positions of authority resist change when their power is threatened by those who are traditionally weak in the organization. Conversely, those with power block the change process by ignoring "grass roots" movements; essentially silencing the call for change by not giving it organizational legitimacy (Agocs, 1997).

While we recognize that most campus constituencies will find themselves in both the position of power and the position of the oppressed at various times, depending on the topic *du jour*, we have selected as the focus of our research the study of resistance to change originating from positions of legitimate authority. Our emphasis is on the value, and in some ways necessity, of being knowledgeable about various campus constituencies prior to embarking on a process of institutional change in an attempt to avoid a level of resistance that will halt the change process. Organizational development literature notes that "it is in management's best interest to anticipate resistance at the individual and group level and to consider possible actions to minimize it" (Szilagyi & Wallace, 1990, p.787).

In order to obtain knowledge about campus constituencies, we advocate a survey-feedback process. The survey-feedback process is recognized as a pre-implementation diagnostic tool which helps the researcher and change agent to better understand the climate in which they are working (Szilagyi & Wallace, 1990). Generally, our research follows Kurt Lewin's unfreezing, changing and refreezing phases of change (Szilagyi & Wallace, 1990). These phases represent a process of familiarizing the change agent with the constituency which is being faced with the change, a use of the change agent's

knowledge about the group to "unfreeze" some of their pre-conceived notions about the impending changes, the facilitation of the change process based on the heightened understanding of everyone's concerns, and finally a capstone which firmly lodges the positive outcomes of the resulting changes in the constituencies' heads until the next time change is necessary. Specifically, our research proposes a model for evaluating data elements commonly associated by organizational development theories with resistance to change. Faculty have been selected as the focus of our study for two reasons: 1) the evolution and devolution of shared governance in its purest of forms provides an historically motivated rationale for faculty to resist change and 2) relevant data about this group are accessible without institutional survey design via the Higher Education Research Institute's (HERI) Faculty Survey. Both of these elements will be considered in turn.

The mid-1960's saw the publication of two policy statements which legitimized the concept of shared governance in institutions of higher education. In 1966, the AAUP, ACE, and AGB jointly published the "Statement on Government of Colleges and Universities" and in 1967, the AAHE-NEA Task Force on Faculty Representation and Academic Negotiations published "Faculty Participation in Academic Governance." Both publications noted that while cooperation was necessary for all major endeavors pursued by an institution, some areas, in particular educational policy, fell more so within the realm of faculty control. Although the nature of their profession allowed faculty to exercise some level of control over their academic proceedings, they welcomed the opportunity to exercise legitimate self-regulation over the educational aspects of their profession. This legitimate exercise of authority, however, resulted in divisiveness between the faculty and the administrative arm of the institution which still maintained control at an organizational level. Eventually, the conflict resulted in an authority stalemate. George Keller noted in this regard that "...little gets done when the king and the barons of the realm have equal power and different views of where to go or how to proceed" (1983, p.35). Institutional growth throughout the 1970's resulted in the increased division of the faculty into various schools and additional departments to accommodate the increased student enrollments, and eventually this helped dissipate the stalemate between the faculty and administration (Birnbaum, 1988). Although at most institutions faculty still maintain general control over educational issues, heightened levels of environmental uncertainty have required that administrators with management-related backgrounds exercise an increasingly high level of institutional control (Birnbaum, 1988). Not all faculty, however, have loosened their grasps on institutional control. Faculty orientation typically falls into one of two categories: local or cosmopolitan (Birnbaum, 1988). While those with a cosmopolitan orientation associate themselves most closely with their discipline on a national level, those faculty who consider themselves to have a local-orientation tend to exercise a strong affinity for the institution by which they are employed. As a result, the "locals" maintain interest in institutional politics and objectives, resulting in the continuation of the major ideals of shared governance and vocalization of adversity to change when their governing power is at risk. For those interested in additional information about the concept of shared governance, we refer you to*Sharing Authority Effectively* by Mortimer and McConnell.

While the brief historical overview of the status of shared governance provides perspective, current data are always important in the organizational decision-making process. The HERI Faculty Study serves as a readily available source to measure the current "mood" of the nation's faculty. The survey has been administered every three years since 1989, with the most recent administration falling during the 1995-96 academic year. The questionnaire collects information on standard faculty issues such as academic preparation, pedagogy, workload, and tenure. In addition, research on faculty's resistance to change is facilitated by a series of questions regarding personal/professional stress, job satisfaction, and perceptions of the campus environment.

The data used in our research represent 3,816 full-time undergraduate faculty from the 31 private colleges and 6 private universities which made their survey results available to the HEDS office for a Consortium data exchange project. It is important to note that the analyses that follow represent a *model* for studying faculty resistance to change. We make absolutely no claims that the 37 institutions contributing data to our analyses represent any symbolic portion of the national professoriate.

In our study, data which measured elements commonly associated with resistance to organizational change were analyzed using a quadrant. We have selected quadrant analyses as a conceptual tool for studying faculty opinion because the quadrants offer a concise picture of the relationship between a single measure and its motivational impact on an individual's behavior. By design, our quadrant analyses measure an individual mean score of job satisfaction, stressors, or perceptions about institutional priorities across the X-axis. The Y-axis measures the correlation between the scores on the X-axis and an overall measure of either job satisfaction or total stress. We refer to the Y-axis as representing the overall motivational importance of a given element. Data points in the quadrants represent the intersection between an individual measure and the motivational importance of that element. We have opted to divide each analysis into two sections. Both personal and community elements of job satisfaction, work- and home-related elements of stress, and perceptions of administrative and educational institutional priorities are considered. Quadrants are determined by the mean level of satisfaction, stress, or priorities across the X-axis and the mean correlation of the individual measures with the overall measures of stress and job satisfaction. The solid quadrant dividers represent the means for each individual analysis (e.g., *personal* elements of job satisfaction), while the broken-line quadrant dividers represent the means for the combined analyses of a given element (e.g., the *combined* affect of personal and community elements of job satisfaction). The dual quadrant dividers allow one to compare individual measures both within and between the two key groups which comprise the analyses.

Each quadrant represents a varying level of "concern" for institutions. For example, Chart 1 measures motivational importance toward job satisfaction as a factor of the individual "personal" elements of job satisfaction. Individual elements appearing in the upper-left quadrant represent areas which have a relatively strong positive correlations with overall job satisfaction, but low satisfaction. Elements in the upper-left quadrant should be considered targets for change. Likewise, data elements appearing in the lower-right quadrant represent data which have relatively weak positive correlations with

overall job satisfaction, but generally high levels of satisfaction. Elements in the lower-right quadrant do not command any attention from the change agent, and can be labeled as "sleepers". Elements in the upper-right quadrant represent areas of both high motivation and high satisfaction, thus representing areas which the faculty view as being "on target." Finally, the lower-left quadrant represents areas of both low motivation and satisfaction. The elements appearing in the lower-left quadrant can generally be viewed as non-priority issues.

Reviewing charts 1 and 2, relating to both personal and community elements of job satisfaction, we find that the key personal motivator which requires organizational attention is providing additional time for professors' scholarly pursuits. Relationships with the administration are cited as the key area for improvement in community related elements of faculty job satisfaction. A look at the narrow positioning of the two quadrant dividers alerts the researcher that both personal and community elements are held in roughly the same regard by faculty respondents. The information gleaned from this model analyses of the impact of personal and community elements of job satisfaction on overall job satisfaction suggests areas which change agents can use to guide the change process. One of the keys to overcoming resistance to change is making the outcome attractive to all constituencies (Szilagyi & Wallace, 1990). By observing faculty concerns and motivators of job satisfaction, these analyses would suggest that proposed improvements in the amount of time allotted for scholarly pursuits and faculty relationships with administrators may provide incentive for faculty to join the bandwagon for change with a decreased amount of resistance. In addition to the prestige of the change agent, the strongest facilitator of change is tension (Szilagyi & Wallace, 1990). Researchers and change agents should propose solutions to identifiable pre-existing tensions as part of the proposed change process as an attempt to make the forthcoming changes as attractive as possible to all constituencies.

A review of charts 3 and 4, related to the motivational relationship between both home- and work-related elements of stress and overall stress, finds that a lack of personal time, household responsibilities, and personal finances are the main personal contributors to faculty stress in our model. From a work perspective, time pressures, research and publishing demands, teaching load and colleagues are found to contribute largely to overall levels of stress. By comparing the results of charts 1 and 3 of our model analyses, we see a consistent appeal on the part of the faculty for attention to their time. Pre-existing high levels of stress in the workplace may indicate an area in which change agents wish to focus prior to the inception of any major change process. Inevitably, change brings about increased levels of uncertainty leading to increased levels of stress. The minimization of stress prior to imposing additional chaos in the environment may bridge some resistance to change (Szilagyi & Wallace, 1990).

Finally, a review of charts 5 and 6 provides a look at faculty perceptions of institutional priorities. In particular, these charts address the impact which faculty perceptions of their institutions' administrative and educational priorities have on their overall job satisfaction. Our model quadrant analysis on perceptions of administrative priorities leads us to discover that faculty are most highly motivated by factors relating to the enhancement of diversity and community. There aren't any factors, however, which

command the institution's attention in the realm of educational priorities, with the exception of the development of student leadership, which just sneaks over the quadrant divider reflecting overall organizational priorities. A similar result in a non-model scenario may suggest a lingering impact of shared governance wherein the faculty tend to see themselves as controlling the educational realm of the institution, and as such are less likely to see fault with the existing structure.

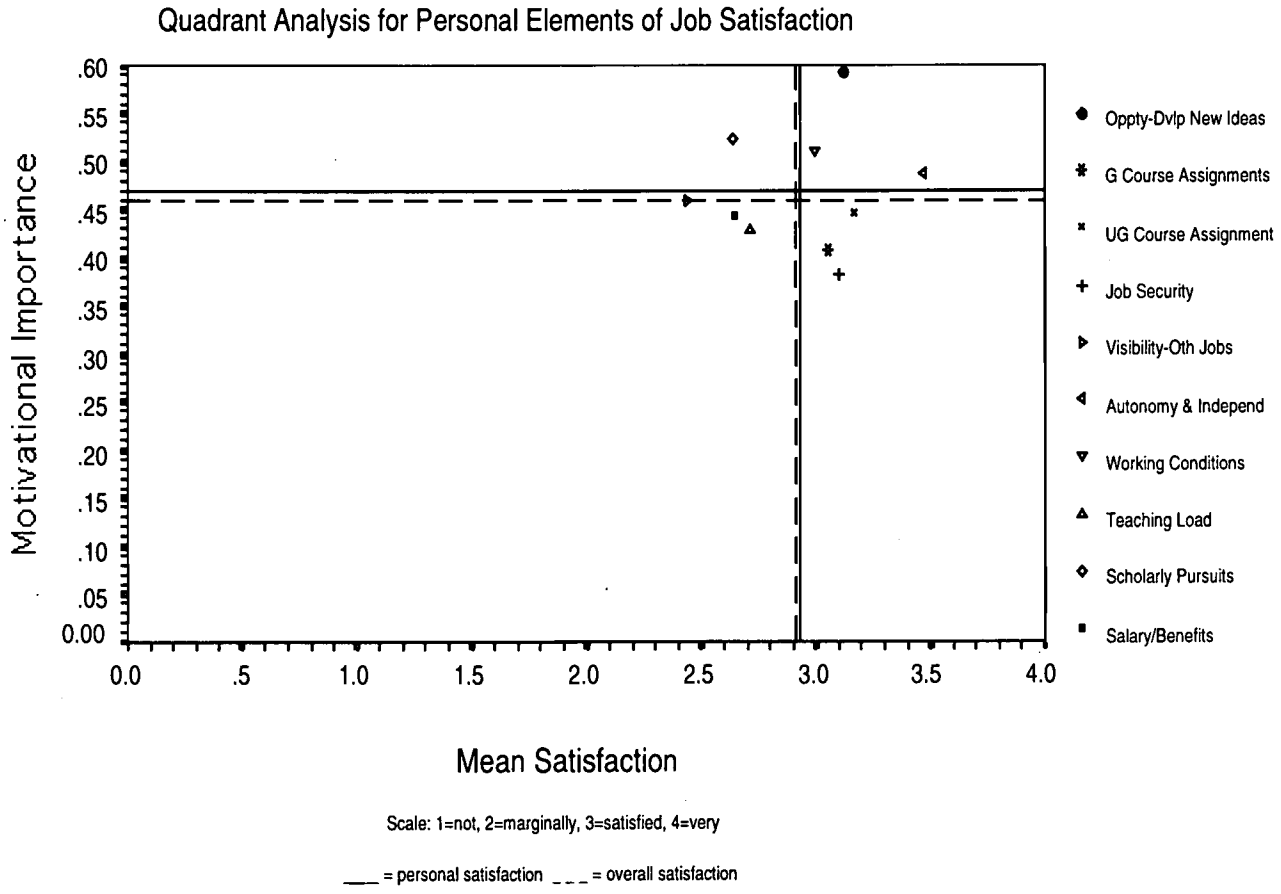
While our quadrant analyses are limited to the modeling of a technique, we hope that it becomes self-evident to the reader that knowledge of the various constituencies involved in the change process is powerful. It is the power to persuade, to bargain, to support, to communicate, and when necessary to manipulate players in the change process (Szilagyi & Wallace, 1990).

Ideally an institution will have the resources to administer both pre- and post-change surveys and analyses. Again, this is constant with the unfreezing and refreezing stages of Lewin's phases of change. Results of the pre-implementation survey allow change agents to identify areas of potential resistance to change, while results of the post-implementation survey allow the identification of reactions to the change process. Depending on the timing of the post-implementation survey, results may even indicate whether the desired change actually occurred. One such survey which sought both pre- and post-change input identified perceived decreases in faculty "...independence/autonomy, the amount of academic freedom, the degree of opportunity for advancement and promotions, and the degree of job security" following the inception of a change process which resulted in the implementation of Management-by-Objectives (Terpstra & Olson, 1984, p.435). In this case, faculty likely responded negatively toward the change because the act of setting objectives in cooperation with others was likely perceived as a threat to their individuality and perhaps even their power to influence decisions within the institution (Szilagyi & Wallace, 1990). The perceived loss of power to another group, referred to in organizational development literature as power equalization, is often a threat to the change process. As mentioned earlier, a perceived loss of power results in an unstable environment, which leads to increased levels of stress, which often precipitates resistance and negativity toward the change process.

In addition to applying our proposed model both pre- and post-change, we also encourage researchers and change agents to use the quadrant analysis model to take a closer look at subsets of the faculty. Although it exceeds the scope of our introduction to studying campus constituencies via quadrant analyses, we recommend that researchers look at factors such as gender, rank, and discipline to further determine potential resistance to change from subsets of the various constituencies. Again, the more information a change agent holds prior to the inception of a change process, the more skilled they will be in managing resistance.

In conclusion, we re-emphasize the need for researchers and change agents to keep in mind Lewin's three stages of change. Remember that the first step toward successful change is the dismissal of misconceptions about the organization and the change process itself. Some kind of survey-feedback process should be used to facilitate this "unfreezing" stage so that researchers and change agents have a factual view of the campus climate and its misconceptions. In addition, a theoretical/contextual

understanding of the various campus constituencies, such as the discussion of shared governance found earlier in this paper, is vital to interpreting the hard data which you retrieve through the survey-feedback process. Apply what you learn about the campus to the actual change process -- employ the help of those who indicate an interest, keep all groups informed to allay fears. And finally, through the use of a second survey administration and analysis of the post-change reactions, refreeze the campus environment in the mold of your recently completed organizational change. While there is never a guarantee of success, we note again that in the change process knowledge is power.


Quadrant Analysis for Personal Elements of Job Satisfaction
Motivational Importance
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Mean Satisfaction
Oppty-Dvlp New Ideas
G Course Assignments
UG Course Assignment
Job Security
Visibility-Oth Jobs
Autonomy & Independ
Working Conditions
Teaching Load
Scholarly Pursuits
Salary/Benefits
Scale: 1=not, 2=marginally, 3=satisfied, 4=very
___ = personal satisfaction _ _ _ = overall satisfaction

CHART 1

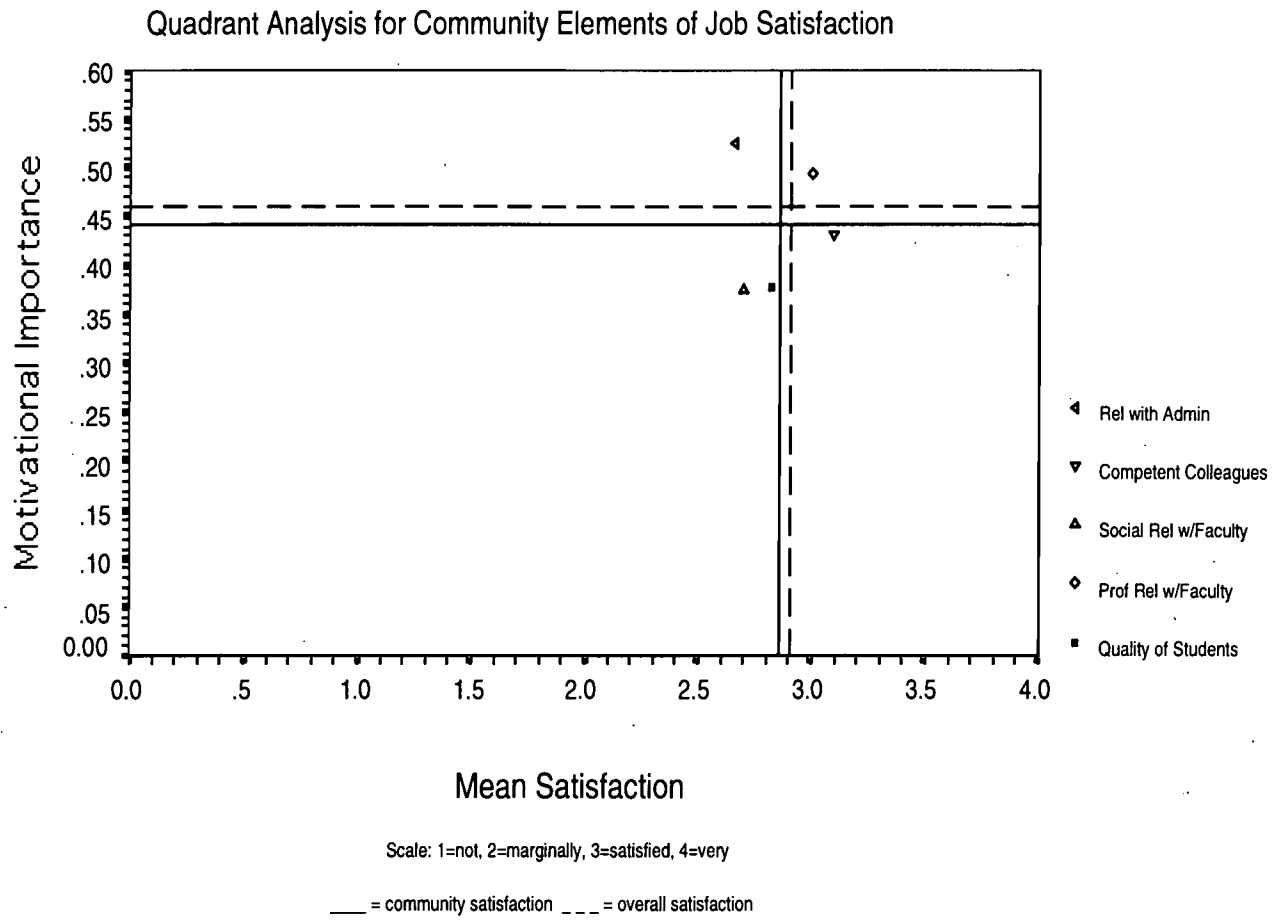

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CHART 2

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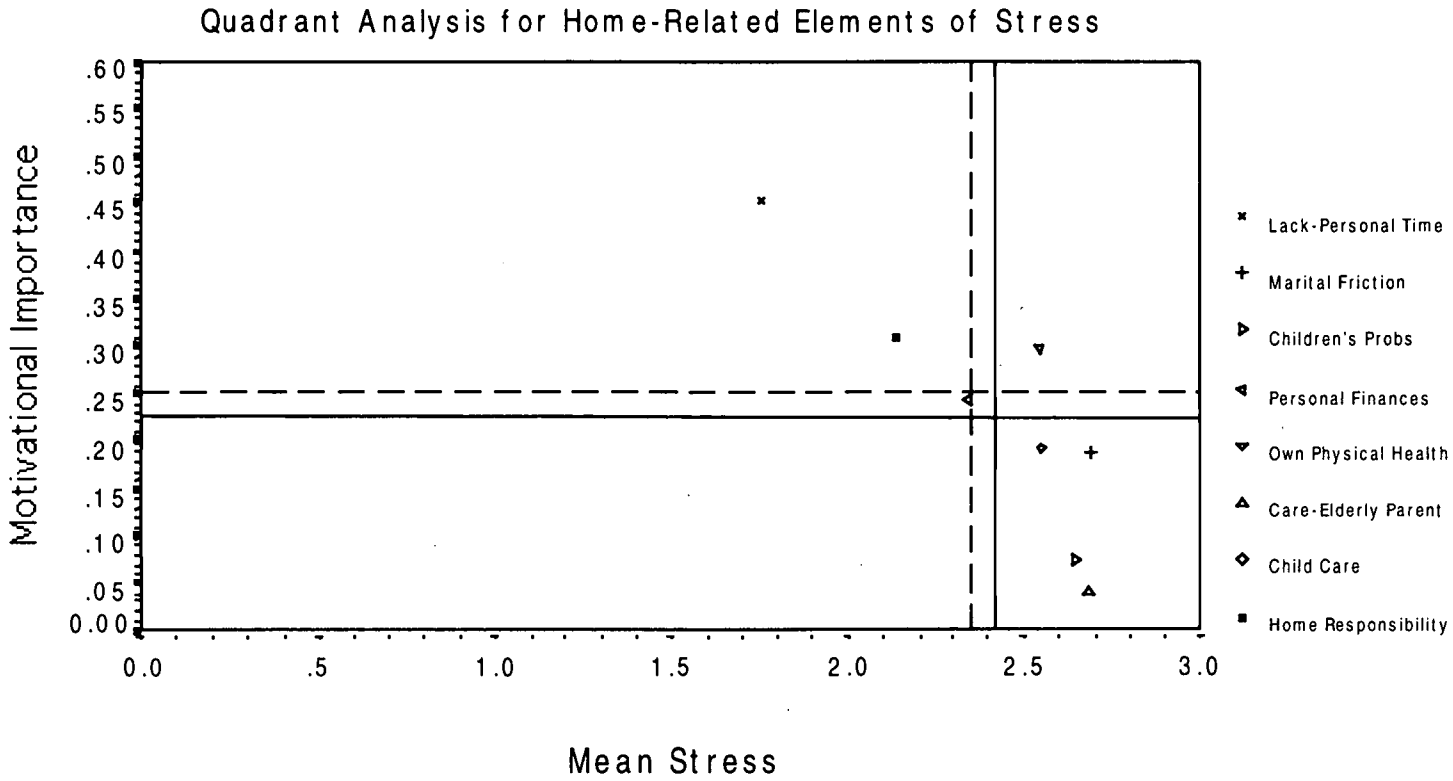

CHART 3

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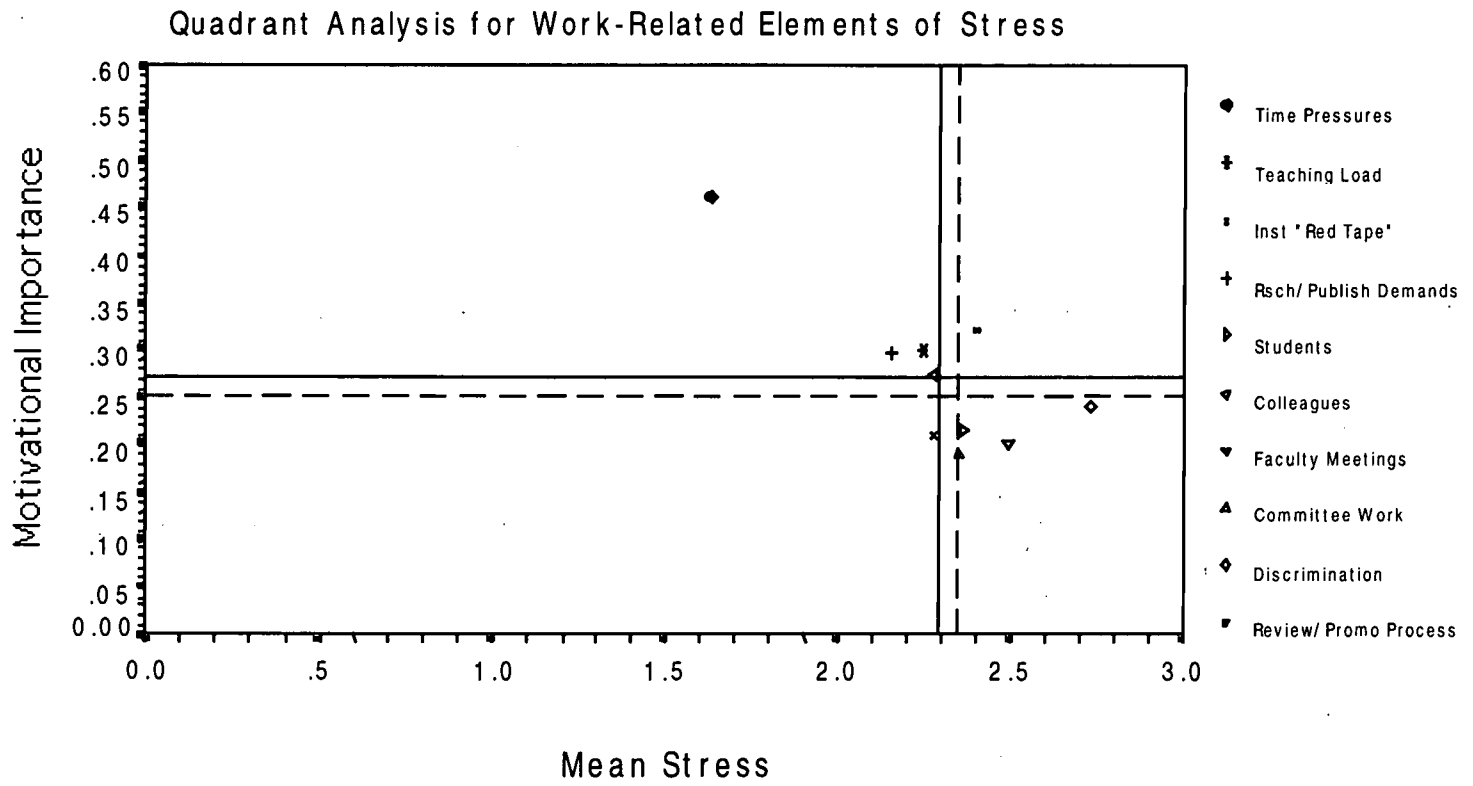

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CHART 4

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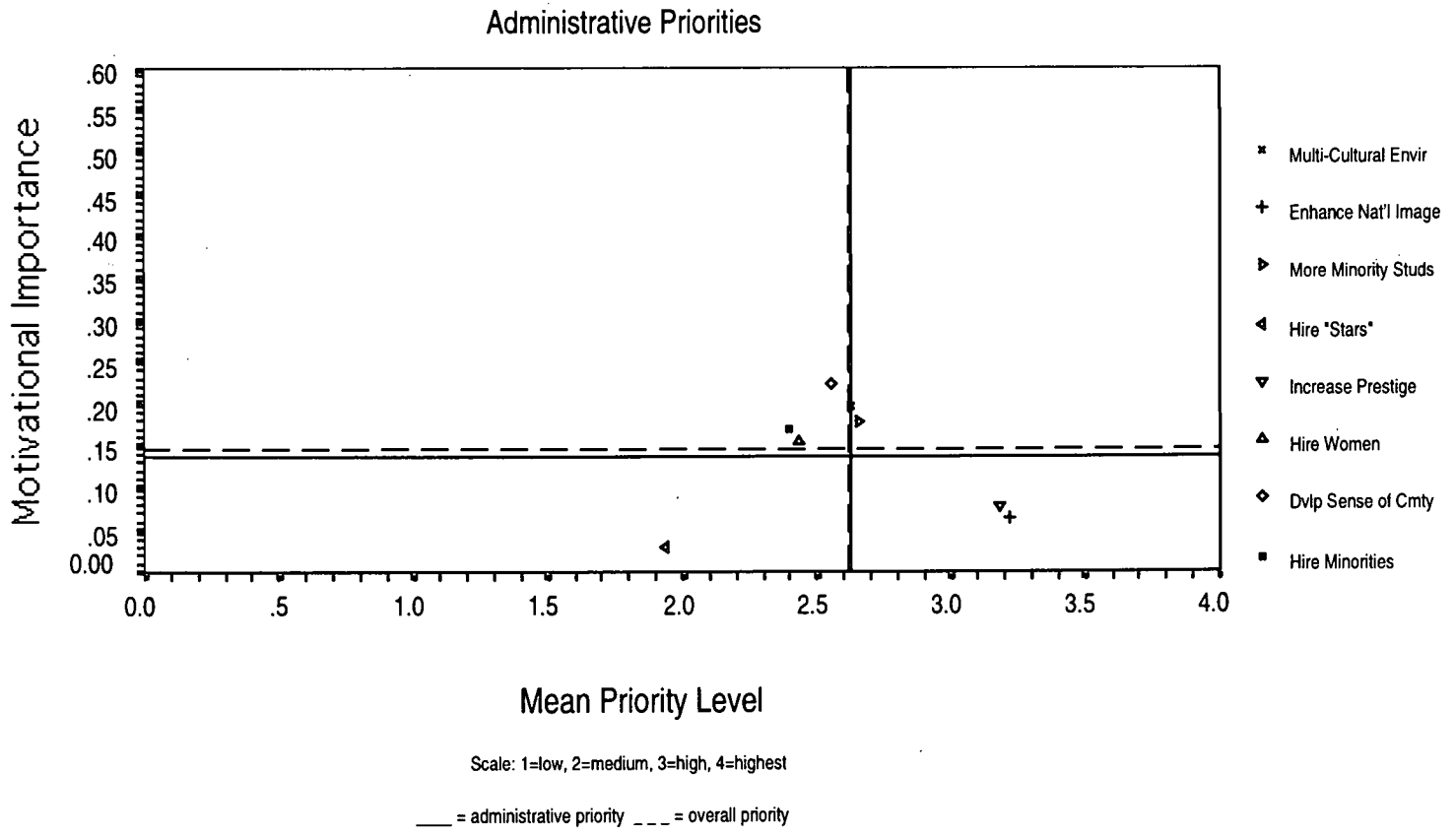
Quadrant Analysis for Faculty Perceptions of Institutional Priorities



Scale: 1=low, 2=medium, 3=high, 4=highest

___ = administrative priority _ _ _ = overall priority

CHART 5

Quadrant Analysis for Faculty Perceptions of Institutional Priorities

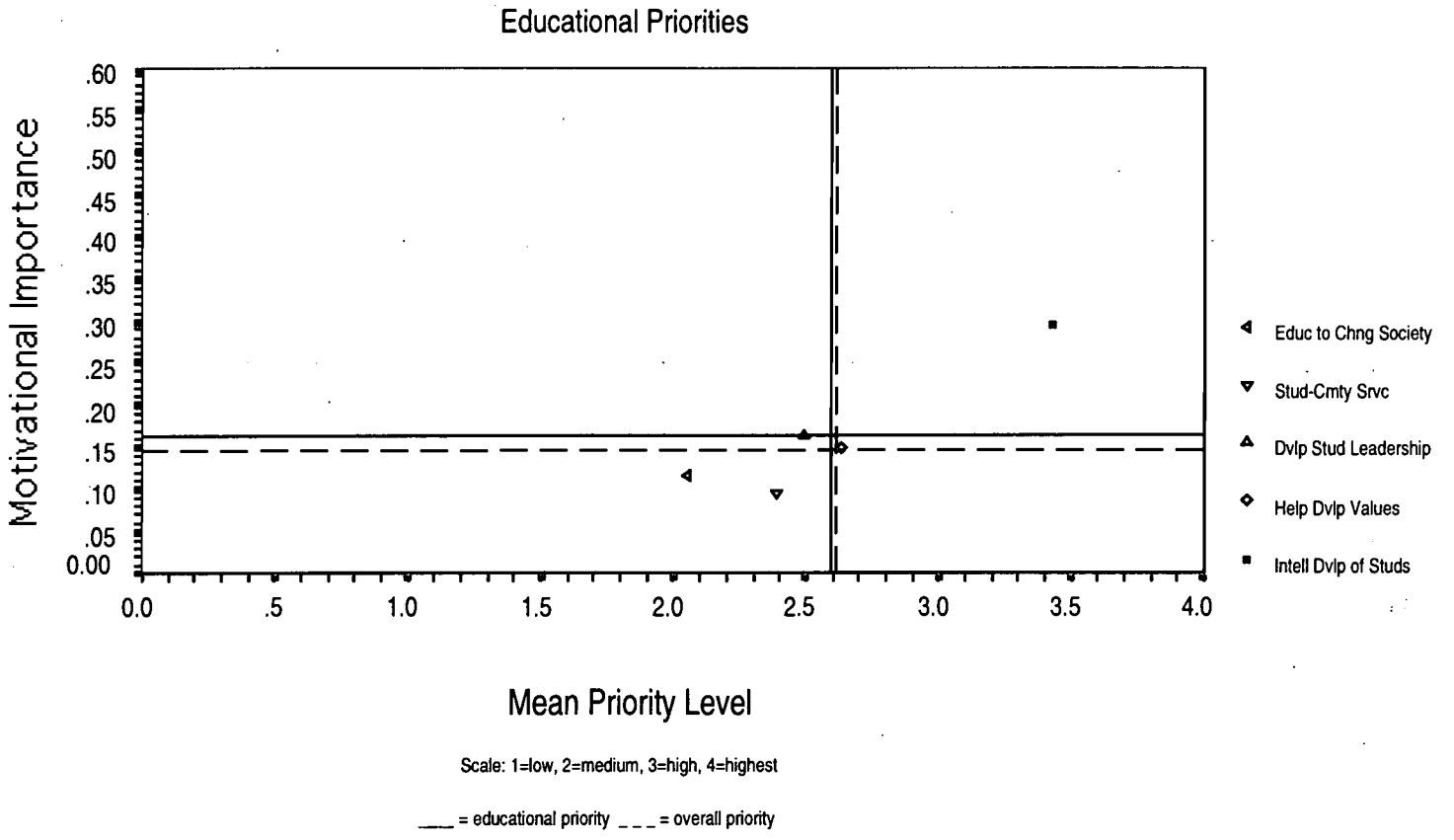


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CHART 6

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REPORT ON FACULTY EVALUATIONS

AT THE UNIVERSITY OF CONNECTICUT, 1993 TO 1996

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Abstract

University administrators and departments now commonly use student evaluations of teaching as one measure of faculty quality in making hiring, retention, tenure, merit and promotion decisions. Consequently they have become increasingly controversial. There is now a large literature on the correlates of student ratings of teaching effectiveness. Some correlates are considered "extraneous," such as the correlation of teacher ratings with students' actual or expected grades in the class. Others correlates suggest some validity to the measure, such as the correlation of the mean student evaluation with the mean amount learned by students in the class.

This paper reviews the literature on the correlates of student ratings, and then uses eight semesters of data from the University of Connecticut, 1993-1996, to explore the degree to which these correlates appear to be "distorting" the use of overall teacher ratings at UConn. Expected grade, and several other variables, are found to be significant predictors of overall course rating, at both the student and course levels of analysis. On the other hand, they only predicted 9% of the variance in course evaluations.

An adjustment equation is tested, giving an expected score for each student on the basis of their expected grade in the course and other variables. These expected scores are used to generate an adjusted score for each student, indicating the degree to which they felt the teacher had done well or poorly, controlling for expected grade and the other correlates. These adjusted overall evaluation means do not change the ordinal position of faculty, departments or schools much, compared to the raw unadjusted score.

In conclusion, these findings indicate that the use of student ratings of faculty is one valid and legitimate measure, among others, in assessment of faculty quality. Adjusted ratings are possible if there is a strong faculty insistence on adjustments being made for "extraneous" biases, but they probably will not dramatically change the overall profile of faculty, departments or schools.

Introduction

University administrators and departments now commonly use student evaluations of teaching as one measure of faculty quality in making hiring, retention, tenure, merit and promotion decisions. Consequently they have become increasingly controversial.

Scriven (1995) summarizes the frequent problems with student evaluations of faculty as:

- The use of instructors to collect forms rating their own instructional merit.
- Lack of controls over pleas for sympathy or indulgence by the teacher before forms are distributed.
- Inadequate time to complete forms.
- Failing to ensure an acceptable return rate.

But a central problem which Scriven does not mention affects all institutions that use student evaluations of faculty to improve instructional effectiveness, and to make merit, tenure and promotion decisions; students bring many opinions and reactions to their ratings which have nothing to do with teacher quality. These "extraneous" effects have been repeatedly demonstrated, but few institutions make any effort to standardize their rating system by controlling for these extraneous factors.

Faculty understand these biases, and dismiss their own poor evaluations as resulting from these evaluations. Therefore, in order to make student evaluations a consistent part of quality assurance and improvement within the university, faculty must be convinced that student evaluations are reliable and valid measures of their teaching competence, or that they have been properly adjusted for these sources of bias.

Validity and Reliability of Student Evaluations of Teacher Performance

A number of studies have demonstrated that student evaluations are correlated with other measures of teacher quality.

Intra-Course and Inter-Course Correlation

Cashin and Perrin (1978) and Marsh (1984) report the following figures on the inter-correlation of students' reports of teacher ratings within classes, which suggest that even smaller classes have reasonably high agreement among students as to teacher quality.

Marsh (1982) found a high correlation (0.61) between the same instructor in two different courses, an even higher correlation (0.72) between the same instructor in two offerings of the same course.

Correlation with Amount Learned by the Student

Cohen's (1986, 1987) meta-analysis of student ratings of teacher quality concludes not only that ratings are correlated with amount learned by students, but that 20% of the variance in teacher ratings was explained by the objective amount students learned. There is an even higher correlation with the amount the students *thought* they had learned (O'Connell and Dickinson, 1993).

On the other hand, some studies have found a negative relationship between amount learned and teacher ratings, suggesting that easy teachers receive high ratings. Also, as I will discuss more below, many researchers believe that students punish teachers when they don't do well in a course, whether it was the students' efforts and abilities which determined the amount learned, or the quality of the teacher.

Correlation with Peer Evaluation and Faculty Self-Evaluation

Student evaluations are moderately correlated with faculty self-evaluations (Blackburn and Clark, 1975; Centra, 1973; Marsh, 1982). Herbert (1995) found, for instance, that teacher self-evaluations were similar to student ratings, and these highly ranked teachers also tended to have more experience and graduate credits. But faculty peer evaluators in the classroom have poor inter-coder reliability (Centra, 1975; Howard, Conway and Maxwell, 1985).

UConn Faculty Evaluations 1993-1996

The current faculty evaluation instrument in use at the University of Connecticut was most recently modified and ratified by the University Senate late 80s. Evaluations are distributed several weeks before final exams, and collected by the end of each semester. Evaluations are rotated among departments/schools on a biannual schedule; half the departments/schools on even years, and half on odd years. Departments can request evaluations in off years.

The Office of Institutional Research has the information collected using this most recent instrument since 1990, and this study compiled the data from the Spring of 1993 to the Fall of 1996. This gives four semesters of evaluation for each school.

The UConn Instrument

The faculty evaluation survey asks eleven basic questions in Section A, which apply to all courses.

Regarding the instructor	1 = Unacceptable 10 = Outstanding
1. Presented course material in a clear and effective manner	1 2 3 4 5 6 7 8 9 10
2. Overall organization	1 2 3 4 5 6 7 8 9 10
3. Made the objectives of the course clear	1 2 3 4 5 6 7 8 9 10
4. Fulfilled course objectives	1 2 3 4 5 6 7 8 9 10
5. Clarified work assignments and student responsibilities	1 2 3 4 5 6 7 8 9 10
6. Stimulated interest	1 2 3 4 5 6 7 8 9 10
7. Graded fairly and impartially	1 2 3 4 5 6 7 8 9 10
8. Used examination items which stressed important aspects of the course	1 2 3 4 5 6 7 8 9 10
9. Accessibility to students both in and out of class	1 2 3 4 5 6 7 8 9 10
10. Instructor's interest and concern for students	1 2 3 4 5 6 7 8 9 10
11. Preparation for each class	1 2 3 4 5 6 7 8 9 10

There has been an ongoing debate in the literature about the validity of teacher evaluation surveys which ask about multiple dimensions of teacher effectiveness, such as course organization, fairness of grading, and enthusiasm. Some have argued that students are responding sensitively to each of these dimensions (Marsh, 1987, 1991). Other researchers however have pointed out that intercorrelation of responses to these different dimensions is so high as to suggest that students are not responding to each item, but to an overall impression of like and dislike of the professor and the course (Abrami, 1982, 1991).

The pattern of responses in this dataset certainly support those who argue for one overall measure of teaching quality. The responses to these 11 items were highly inter-correlated (alpha = .96). All 11 questions loaded into a single factor in factor analysis. Consequently they were added together into an overall evaluation scale for which

0 = all 11 questions answered '1' "unacceptable"
99 = all 11 questions answered '10' "outstanding"

This scale was then used to compare the groups of students, faculty and courses below.

The survey also includes questions about:

- **Semester Standing**: 1-2, 3-4, 5-6, 7-8, 9 or more, Graduate
- **Expected Grade in Course**: A, B, C, D, F, Pass, Audit
- **Is Course in my Major**: Yes, No
- **Cumulative GPA**: 3.7 or above, 2.7-3.6, 1.7-2.6, 0.7-1.6, Less than 0.7
- **How often did you attend class:** 90-100%, 75-89%, 50-74%, 25-49%, 0-24%

For the purposes of analysis, a number of additional characteristics about the teachers and classes were added to the dataset from university records.

"Extraneous" Effects on Ratings

For many of these variables plausible arguments can be made as to why these are actually valid correlates of teaching quality. For instance, students rate smaller classes more favorably, but perhaps teachers teach better in smaller classes.

Performance and Grade in Course

Actual and expected grades in a course have long been found to be correlated with teacher evaluation (Bausell and Magoon, 1972; Chacko, 1983; Cohen, 1982; Marsh, 1982). But, as mentioned above, the meaning of this correlation is controversial. A few researchers have suggested that this is a partial indicator of the validity of student evaluations: teachers aren't doing as good a job if their students aren't learning. Most studies have found, for instance, that there is a correlation between the mean amount learned by sections of a multi-section course, and the mean evaluation given the teacher of each section; that is, teachers of classes that learned more got higher ratings (Cohen 1981, 1983).

On the other hand, most researchers prefer the "self-serving" or "hedonic" bias explanation: students blame teachers for their failures (Gigliotti and Buchtel, 1990). Conversely, students may also feel positively towards a teacher if they did well in the course.

The timing of the survey in relation to testing and grading also effects evaluations. Ratings of teachers are lower after receiving grades (Engdahl et al. 1993) and after major tests (O'Connell and Dickinson, 1993).

As in the literature, the data from UConn also show that a student's expected grade is a strong predictor of their rating of the teacher's performance on all 11 dimensions. In particular, expected grade is most strongly correlated with the student's belief that the teacher graded fairly and that the exams were fair, reinforcing the hedonic interpretation of this relationship: students blame poor grades on unfair tests.

The mean expected grade is also correlated with the mean course evaluation per course ($r=.096$, $p < .000$, $N=7206$). This would suggest that, not only do reward or punish their

professors for their grade performance relative to one another, but also for their absolute grade performance relative to all classes. At the level of the department, however, there is no significant relationship between the departments' average expected course grades and their average course evaluations.

Year in School and Level of Course

Upper level courses receive slightly higher evaluations than lower level courses, though this relationship is confounded by the fact that higher level courses are taken by a smaller, more self-selected student population, and are themselves smaller classes.

The UConn data show that students in higher level courses do give them higher ratings, and that upperclassmen and graduate students are more satisfied with their instructors than freshmen and sophomores. Mean semester standing of the students in the class and level of course are also predictive of mean course evaluation at the course ($r=.15$, $p<.000$, $N=7217$; $r=.18$, $p<.000$, $N=7217$).

In the UConn data, upperclassmen, and students in higher level courses, appear to be more likely to have had their interests "stimulated" by the course material, and feel the teacher demonstrated "interest and concern for students." This is probably due, at least in part, to the smaller classes, and the fact that the student is more likely to be in an elective class related to their interests.

Size of Class

Students give slightly higher ratings to smaller classes (Feldman, 1984; Marsh, 1987; Marsh, Overall and Kesler, 1979). This was found to be true at UConn as well. At the course level, size of course is again correlated with mean course evaluation ($r=-.13$, $p<.000$, $N=7223$). Somewhat less significantly, due to small numbers, the average size of classes in a department is a predictor of that department's course evaluations ($r=-.19$, $p<.07$, $N=90$).

The two things which appear to suffer most as class sizes grow are, not surprisingly, "accessibility to students in and out of class" and "interest and concern for students." The two positive benefits of being in a large class are superior "overall organization" and the teacher's "preparation for class."

Student Expectations and Motivations

Students do not expect only easy material, or tolerant grading. Rather, student expectations reflect a desire for balance. For instance, a study of 500 university students in St. Louis (Cravens, 1996) found that among the top twenty desirable characteristics of faculty were both "uses facts and examples not in the text" and "lectures on contents of the text," and both "flexibility" and "an adherence to regulations." The top five desired characteristics in that

study were (1) use of relevant examples; (2) clear emphasis on facts; (3) use of visual aids; (4) use of humor; and (5) projects enthusiasm.

No studies were found, however, which measured a student's general academic motivation. The UConn instrument had two questions which permitted indirect measurement of academic motivation: self-reported attendance and self-reported GPA. Both suggested that motivated students, those with high GPAs and those who attend class, rated their courses more favorably.

Motivation and class ratings are also powerfully correlated at the course level. Mean course evaluation per course was correlated with mean attendance ($r=.25$, $p<.000$, $N=7217$), and with the student's cumulative GPA ($r=.17$, $p<.000$, $N=7215$). Again, at the department level, the average amount of class attendance and the average student's GPA are correlated with the average course evaluation for that department's courses ($r=.28$, $p<.01$, $N=90$; $r=.22$, $p<.05$, $N=86$). That attendance is most strongly correlated with "stimulated interest" strengthens the case that interest in the class is both cause and effect of perceived teacher quality.

Discipline and Difficulty of Course, and Required vs. Elective Courses

Students' evaluations of faculty quality are influenced by the difficulty of the material, and by whether they are required to take the course. Students give higher marks when taught easier material and lower marks when taught harder material (Dickinson, 1990). Students give higher marks to courses in their major, but lower marks to required courses than to electives (Feldman, 1978; Marsh, 1987; Civian and Brennan, 1996).

Course difficulty interacts with discipline of the course. Civian & Brennen (1996), controlling for many other variables, found that students gave higher evaluations to social sciences/humanities/core curriculum courses than to math/science courses. They also gave courses they judged to be more difficult a higher score, unless it was a math or science course, and then perceived difficulty lowered evaluations (there was an interaction effect between math/science and difficulty).

Differences in ratings between disciplines is not solely the result of a general distaste of students for difficult math and science courses, however. The teaching behaviors of faculty also differ across disciplines. Arts and humanities professors have been consistently shown to encourage more student participation, while social science and natural science teachers are superior at structuring and organizing their course material (Murray and Renaud, 1995). This does not give a systematic edge to one or another discipline, since students appreciate both highly participative and well-organized teaching, regardless of discipline.

In our data, the percent of majors in the class is also a predictor of the mean class evaluation ($r=.12$, $p<.000$, $N=7222$), but is not a predictor at the department level. In other words, departments are not disadvantaged if they have a larger number of non-majors taking their courses.

Time of Day, Day(s) of Week

Feldman (1996) found no evidence in his review of the literature that there was an effect on student ratings of courses from the time of day, or day of week, of a course. Our data do show such an effect however; students prefer courses that meet once a week, preferably not on Monday or Friday, and in the late afternoon or evening.

Multivariate Models of Overall Evaluation

Since many of the variables above are inter-correlated, multi-variate analysis may show that some differences are derivative of others.

Table 2: Regression Models Predicting Overall Evaluation, at Student and Course Levels of Analysis

	Student-Level Model (R^2 = .09)		Course-Level Model (R^2 = .19)		
	Unst. B	St. *B*	Unst. B	St. *B*	Meaning
(Constant)	91.8		100		
Student's Self-Reported Expected Grade in Course (A=0, B=1, C/Pass=2, D=3, F=4)	-6.7	-.28	-11.5	-.44	Higher expected grades predict higher ratings
Student's Self-Reported Attendance in Course (100-90% = 0, 89-75% = 1, 74-50%=2, 49-25%=3, <24%=4)	-2.8	-.09	-6.8	-.15	Higher attendance predicts higher ratings
Student's Self-Reported Cumulative GPA (4.0-3.7 = 4, 3.6-2.7=3, 2.6-1.7=2, 1.6-0.7=1, <0.7=0)	-1.9	-.07	-3.1	-.11	The higher the cumulative GPA of the student, the ***lower*** the rating
Number of Semesters Student Had Been at UConn (1-2=1, 3-4=2, 5-6=3, etc.)	.27	.02	--	--	The more semesters a student is at UConn, the higher they rate their classes
Course was in Student's Major (Was=0, Wasn't=2)	-0.5	-.03	-.37	-.02	Students give higher ratings to courses in their major
Number of Students in Class	.001	.005	-.02	-.05	Contradictory
Once or More a Week (Once/wk = 1, More = 2)	--	--	1.2	.05	Contrary to the first order findings, students give *lower* ratings to courses that meet only once a week

All variables are significant at $p < .001$

Regression models on the overall course rating dropped "level of course" as a significant predictor, presumably because it was actually reflecting the fact that upperclassmen like their classes better, and students in smaller classes like them better.

Although these variables were still significantly predictive in multivariate regression because of large numbers, the effects were very small , and the overall models explain only 10% of the variance (R^2=.10).

Standardized Scores

Presumably some of the remaining 80-90% of variance which cannot be explained with the variables we have in this model reflect valid assessment of teacher quality.

As a second step, then, we can control for the variables in the regression models above and generate a standardized score based just on this remaining 80-90% of variance. (Of course, to some degree, the variables above are also both predictors of real quality as well as extraneous student biases. Our standardized measure will be ignoring real differences in quality to that small extent.)

I've generated the standardized measure by predicting for each student what score they would have given a course if the only things they were scoring on was their expected grade, overall GPA, semester in school, and attendance in class.

The resulting adjusted score can be represented as the amount a student's rating of a course was higher or lower than what we would have expected on the basis of the student's "extraneous" factors. This difference can be added to the university-wide rating (the constant, i.e. 80.0) and given as an adjusted score for a course, instructor, department, or school (80.0 + 5.0= 85.0, etc.). These adjusted scores did not appreciably change the ranking of departments within schools, nor between the schools, as compared to the unadjusted rankings.

Conclusions

Student evaluations of faculty have become increasingly controversial as universities have begun to tie them, among other measures of faculty performance and quality, to pay and promotions. Many faculty deeply resent their use, arguing that students are incompetent to judge their teaching quality, and as this study demonstrates again, often evaluate professors on the basis of many extraneous factors. Very few studies have been able to demonstrate an effect of evaluation on teacher behavior (L'Hommedieu, Menges, and Brinko, 1990).

This study should encourages faculty to regard student evaluations a serious measures of their own performance, and thereby make them more powerful tools for changing teaching behavior. Convincing faculty that the appropriate "handicapping" has been used is probably as difficult as convincing them of the utility of raw, standardized measures. But this report suggests that it is possible to show that the difficult task of devising standardization formulae may be unnecessary, leaving the task of getting faculty to take these surveys seriously.

Like previous research, this study suggests that there are certainly methodological problems with student evaluations, but that these problems are small and ameliorable. While students may not be responding sensitively to each question, they are giving a consistent overall picture of a single overall evaluation of their teacher. Secondly, though almost every testable

variable is related to the overall evaluation to some degree, these "extraneous" effects explain only a small amount of variance. The large unexplained variance must include some degree of legitimate evaluation of teacher performance, and other studies have demonstrated this to be the case. Controlling evaluation means for their "extraneous" correlates does not greatly change the relative performance assessment of the units being studied.

These findings suggest that student evaluations can be defended as a reasonable measure of teacher performance, especially if they are standardized for the most important "extraneous" correlates such as "expected grade in the course."

Further Research

Longitudinal Research One line of research that is missing in the literature is longitudinal research; do teachers improve over time, controlling for size of class, level of course, and the other factors that change with seniority? We found only Ludlow's (1996) suggestive study of his own course evaluations in our literature review. Analyzing the UConn data since 1990, by unique faculty IDs, would be an important contribution to the literature. This would provide a seven year span of evaluations for most faculty, which is not much time to observe improvement (or decline) for associate and full professors, but may be adequate to demonstrate improvement in instructors and assistant professors.

Hierarchical Linear Analysis One of the questions that cannot be addressed with simple linear regression is the separate effect of school and department-level variables on performance. For example, is the cumulative age or gender of a department's faculty a predictor of student evaluations, as distinct from the effect of any particular faculty member's age or gender? This kind of analysis begs for hierarchical linear analysis, which is a more ambitious and long-term undertaking, and a project where collaboration with the Statistics Department would be very helpful.

Bibliography Available on Request ***hughes@uconnvm.uconn.edu, 860-486-1903***

FIRST-YEAR STUDENT EXPECTATIONS: PRE- AND POST-ORIENTATION

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Introduction

Every year college freshmen enter institutions of higher education with a set of preconceived ideas and expectations. In some cases, these expectations are unrealistic and can result in a student facing academic or social failure and withdrawal from the institution. The purpose of this study was to identify the academic, personal and social expectations of first-year students at Miami.

In May, 300 paid-deposit students (randomly selected with an over sampling of minorities) were mailed the "PEEK-Perceptions, Expectations, Emotions and Knowledge about college," a 30-item survey designed to measure student expectations in three areas: academic, personal and social. A list of the questions and the available responses are in Appendix A. A response rate of 68% was obtained from this group. During Orientation, first year students were involved in various intervention activities designed to assist them in understanding the context of a college education. These activities included small group discussions with faculty and staff about student life at Miami University, individual faculty and academic advisor meetings, and student awareness skits. In August, 300 students who had attended Orientation (randomly selected, excluding students who participated in the first mailing) were mailed the same survey. With 96% of Miami's first-year students attending Orientation, the responses of this group can be considered reflective of the attitudes of the incoming students. A response rate of 36% was obtained from this group. Due to the fact that the second group was sampled after Orientation, we have been able to make some comparisons between students' attitudes before Orientation and students' attitudes and expectations after attending Orientation. A three-way Analysis of Variance was conducted on all 30 questions using gender, student of color status and Pre- and Post-Orientation group. These analyses were conducted to help support our findings. Results of these analyses are available upon request. Any significant differences between Pre- and Post-Orientation groups that are found should be interpreted very carefully due to the fact that the same students were not involved; however, when differences do occur discussion can arise on possible explanations and interpretations. A breakdown of some demographic information about these two groups can be found in Table 1.

Table 1

	Pre-Orientation N = 201		Post-Orientation N = 108		Total Survey Group N = 309		First-Year Students N = 3,364	
	N	%	N	%	N	%	N	%
Male	78	39%	33	32%	113	37%	1,411	42%
Female	119	59%	72	67%	191	62%	1,953	58%
Students of Color	42	21%	8	7%	50	16%	285	8%
White	159	76%	100	88%	259	84%	3,079	92%
Ohio Resident	139	69%	67	63%	206	67%	2,363	70%
ACT > 22	162	81%	93	87%	255	83%	2,327	83%
ACT > 25	99	49%	60	56%	159	51%	1,355	48%
Division of Major								
CAS	72	36%	33	31%	105	34%	1,676	50%
SEAP	35	17%	8	7%	43	14%	397	12%
SBA	36	18%	19	18%	55	18%	843	25%
SFA	6	3%	11	10%	17	6%	212	6%
SAS	8	4%	10	9%	18	6%	189	6%
SIS	3	1%	0	0%	3	1%	47	1%
Undeclared	34	17%	25	23%	59	19%	0	0%

Academic Experiences

First-year students appear to have an impression of academic life that includes 1) dependence on faculty for learning assistance -- over 40% indicate that it is likely that an instructor will tell them if they are having difficulty in a course; almost 25% expect instructors to teach them study skills needed for their courses; nearly 20% say it's likely that their college instructors will keep track for them of how well they are keeping up with assignments and following the syllabus; over 50% indicate that it is likely their college instructors will be concerned about how well they are doing; and 2) expectations that academically college will be a repeat of high school -- 96% indicate it is likely their grades will be the same as in high school; over 60% expect not to have trouble doing well in their classes; 40% indicate that it is likely that the material presented in class will repeat what is in the textbook (See Table 2).

Interestingly, for those students responding after attending Orientation, their expectations towards their academic abilities in college changed when compared to those of the students responding before Orientation, perhaps a result of the intervention on the part of the staff and faculty involved in Orientation (Table 2). Those expecting a repetition of textbook material dropped by over 20%; expectation of academic performance dropped by almost 20% while grade expectations only dropped by 3%; and expectation on faculty involvement in the student's learning (the instructor will tell them if they are having difficulty in a course) dropped by almost 15%. From the three-way ANOVA, significant

differences were found by gender (instructor involvement); by Pre- and Post-Orientation group (grade expectations, repetition of textbook material, expectation of academic performance) and by gender x student of color status (grade expectations, repetition of textbook material and instructor involvement). These results are summarized in Appendix B.

Table 2

ACADEMIC EXPERIENCES	Extremely, Quite or Somewhat Likely		
	Total	Pre-Orientation	Post-Orientation
My college grades should be about the same as were my high school grades.	96%	97%	94%
If I am having difficulty in a course, the instructor will tell me.	43%	48%	34%
The material presented by my instructors will simply repeat what is in my textbooks.	40%	48%	27%
My college instructors will be concerned about how well I am doing in their courses.	52%	54%	49%
I will not have trouble doing well in any of my courses.	63%	70%	52%
My college instructors will teach me the study skills I will need for their courses.	24%	26%	21%
My college instructors will keep track for me of how well I am following the class syllabus and keeping up with my assignments.	17%	20%	11%

Personal Experiences

Pre-Orientation students expect to succeed at Miami University. They appear to be very confident in their preparation to perform college-level work and to participate actively in taking responsibility for their own learning. Post-Orientation figures show a dramatic change in the students' emotional reactions to whether or not they are prepared to do college-level work. It would seem that students begin to develop a more realistic picture of the collegiate environment after Orientation (see Table 3). Interestingly after Orientation, this realistic picture of Miami University leads the students to have lower confidence in their ability to succeed. Significant differences found in a three-way ANOVA (gender by students of color status by Pre- and Post-Orientation groups) can be found in Appendix B.

Table 3

	Extremely, Quite or Somewhat Likely		
PERSONAL EXPERIENCES	Total	Pre-Orientation	Post-Orientation
I will not need any outside help to do well in my courses.	51%	59%	36%
I will know exactly how college fits into my future goals and plans.	84%	89%	73%
It will be difficult to discipline myself to keep academic commitments, such as attending classes and being prepared for class.	26%	20%	38%
I am worried that I won't make it through college.	19%	16%	24%
The reading skills I developed in high school will be adequate for my college courses.	83%	88%	74%

Social Experiences

Students' perceptions of family interaction, peer pressure and interaction with students who have values similar to their own changed the most between Pre- and Post-Orientation. Eighty-one percent of the students in the Pre-Orientation survey indicate they are likely to interact with students that have similar values to their own, while only 69% believe this to be true after Orientation. Ten percent more students in the Post-Orientation group perceive that the relationship with their family will likely change when they go to college. Miami University first-year students expect to experience a lot of social pressure in college and that impression increased in the Post-Orientation group (see Table 4).

Interestingly, men seemed to experience more change in the social experiences area than women when comparing the Pre- and Post-Orientation groups. After Orientation, more men expressed the likelihood for a changing relationship with their high school friends, the need to work at making new friends when they are on campus, and understanding that their classmates will have different values than themselves. A three-way ANOVA was conducted on the social experiences items (gender by students of color status by Pre- and Post-Orientation group) and the significant differences are shown in Appendix B.

Table 4

		Extremely, Quite or Somewhat Likely		
SOCIAL EXPERIENCES		Total	Pre-Orientation	Post-Orientation
I will have to work at making new friends.	Total	60%	59%	62%
	Men	59%	54%	71%
	Women	60%	61%	57%
My relationship with my family will not change when I go to college.	Total	60%	64%	54%
My relationships with my high school friends will not change when I go to college.	Total	36%	38%	32%
	Men	41%	46%	29%
	Women	32%	32%	32%
Most of my classmates will have values similar to mine.	Total	76%	81%	69%
	Men	77%	83%	63%
	Women	76%	79%	72%
I will experience a lot of social pressure in college.	Total	79%	75%	85%

Students of Color

Significant differences cannot be found between the total group of white students and the students of color. However, within the students of color group there seems to be a wide range of differences. Most of these differences result from the surveys completed by African American students. The African American students comprised 15 of the 50 students of color in the total survey. There were not enough students of color in the Post-Orientation group to examine differences between Pre- and Post-Orientation groups.

African American students see themselves interacting less with faculty members and feeling that faculty members will have less interest in them (Table 5). Only 20% of the African American students believe they will have frequent opportunities to talk with their instructor as compared to 40% of the white students, and no African American students felt like their instructor would be concerned with how they are doing in class. African American students expressed an intent to join fewer organizations than they were involved in during high school. They also indicated having more stress than white students and concern over how college fits into their future goals. African American students expect to interact with students whose values are different than their own. African American students have different perceptions and expectations than white students and other students of color.

Table 5

ACADEMIC, PERSONAL & SOCIAL EXPERIENCES	Extremely or Quite Likely		
	White	Students of Color*	African American
If I am having difficulty in a course, the instructor will tell me.	15%	12%	0%
I will know exactly how college fits into my future goals and plans.	45%	52%	26%
My college instructors will be very concerned about how well I am doing in their courses.	16%	14%	0%
Most of my classmates will have values similar to mine.	30%	20%	6%
In college, I will join fewer student organizations than I joined in high school.	20%	30%	40%
There will be frequent opportunities to talk to my college instructors.	40%	35%	20%
I will not feel stressed in college.	5%	14%	20%
My college instructors will get to know me on a personal level.	24%	24%	13%

* Includes African American students.

Conclusion

Miami first-year students come to the university with a set of expectations that we, as faculty and administrators involved in the learning and development of the student, must be made aware of. Coming in with unrealistic expectations can lead to disillusionment and failure. Orientation can serve as an important intervention experience to assist students in developing a realistic view of college experiences. As evidenced by this study, Orientation seems to help frame Miami University as a community of learners with a rigorous academic program. Areas where student expectations differed between the Pre- and Post-Orientation groups were:

- ◊ students' anticipated interaction with faculty
- ◊ students' perception of their peers and peer influence
- ◊ expected level of faculty participation in the student's learning process
- ◊ students' perceived academic skills as they enter college
- ◊ students' perception of academic assistance for success

APPENDIX A

PEEK: Perceptions, Expectations, Emotions and Knowledge about College
Weinstein, C., Palmer, D., and Hanson, G. © 1995, H&H Publishing Company, Inc.

Available Responses:

Extremely likely to be a part of my college experience.
Quite likely to be a part of my college experience.
Somewhat likely to be a part of my college experience.
Not very likely to be a part of my college experience.
Not at all likely to be a part of my college experience.

ACADEMIC EXPECTATIONS

My college grades should be about the same as were my high school grades.
If I am having difficulty in a course, the instructor will tell me.
The material presented by my instructors will simply repeat what is in my textbooks.
My college instructors will be concerned about how well I am doing in their courses.
I will not have trouble doing well in any of my courses.
It will be more important to memorize what is being presented in my classes than to think about it.
My college instructors will teach me the study skills I will need for their courses.
There will be frequent opportunities to talk to my college instructors.
My college instructors will keep track for me of how well I am following the class syllabus and keeping up with my assignments.
I will have to check to see if I understand the material in my textbooks and other reading assignments.

PERSONAL EXPECTATIONS

I will not need any outside help to do well in my courses.
I will know exactly how college fits into my future goals and plans.
It will be difficult to discipline myself to keep academic commitments, such as attending classes and being prepared for class.
I will have to take a lot of responsibility for my own learning.
There is nothing I will rather be doing than getting my college degree.
I will have to generate my own interest in my college courses.
I will sometimes feel overwhelmed by the workload.
I will not feel stressed in college.
I am worried that I won't make it through college.
The reading skills I developed in high school will be adequate for my college courses.

SOCIAL EXPECTATIONS

I will have to work at making new friends.
My relationship with my family will not change when I go to college.
My relationships with my high school friends will not change when I go to college.
Most of my classmates will have values similar to mine.
I expect to be treated more like a number and less like a person.
In college, I will join fewer student organizations than I joined in high school.
I will experience a lot of social pressures in college.
I will be exposed to students with a wide range of ages.
I will meet students with many different cultural backgrounds.
My college instructors will get to know me on a personal level.

APPENDIX B

THREE-WAY ANOVA RESULTS

Indicating items of significance

Survey Item	Gender A	Student of Color B	Pre- & Post-Orientation C	AB	AC	BC	ABC
My college grades should be about the same as were my high school grades.			X	X			
I will not need any outside help to do well in my courses.			X				
I will know exactly how college fits into my future goals and plans.			X				
My relationship with my family will not change when I go to college.			X				
The material presented by my instructors will simply repeat what is in my textbooks.			X	X			
It will be difficult to discipline myself to keep academic commitments, such as attending classes and being prepared for class.						X	
Most of my classmates will have values similar to mine.			X				
I will not have trouble doing well in any of my classes.			X				
There is nothing I will rather be doing than getting my college degree.			X				
It will be more important to memorize what is being presented in my classes than to think about it.		X					
My college instructors will teach me the study skills I will need for their courses.				X			
I will not feel stressed in college.	X						
My college instructors will keep track for me of how well I am following the class syllabus and keeping up with my assignments.	X						
I am worried that I won't make it through college.	X	X					
The reading skills I developed in high school will be adequate for my college courses.			X				

X = p < .05

REMEDIAL STUDENT OUTCOMES AT MASSASOIT COMMUNITY COLLEGE

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Introduction

Massasoit Community College is one of 15 community colleges in Massachusetts with an open enrollment policy. Such a system offers students lacking college level skills an opportunity to develop necessary academic skills by taking remedial courses, often in reading, writing and mathematics. Massasoit is one of many two-year and four-year public institutions offering remedial courses to under-prepared students. In Fall of 1996, 8.7% of all courses offered at MCC fit the criteria of remedial. Some estimates are that 75% of U.S. colleges now offer such courses in reading, writing and mathematics, and that 30% of entering freshmen enroll in at least one remedial course (Manno, 1995).

There are concerns that the emphasis on remedial education at the post-secondary level compromises the educational integrity of the college degree while inflating its cost. In Massachusetts, the Board of Higher Education adopted a policy on developmental education that requires four-year public institutions of higher learning to enroll no more than 10% of the freshman class in developmental reading, writing and math courses by September 1997, and no more than 5% by September 1998. The gradual implementation of this policy may result in a greater need for remedial courses at community colleges in Massachusetts. Similar changes in state policies or laws enacted throughout the country will also affect the delivery of remedial education in other states (Lewis, 1996). These concerns and policy changes have prompted a number of institutional studies to focus on the effectiveness of remedial education. One institutional study conducted at the Community College of Aurora in Colorado found that 46% of the new math students did not take the recommended remedial courses and that outcomes improved when students took remedial courses as recommended (Carter, 1995). An institutional study conducted at Sinclair Community College in Ohio followed four groups of students over a three year period, including those who chose to take all, some or none of the recommended developmental courses and those for whom no developmental courses were recommended (Carter, 1995). This study found that GPA was higher among those students who took all developmental courses when compared to those who just took some of them. In a study that focused on retention, a survey was distributed to 56 developmental education students who were retained through the developmental mathematics programs and were taking college-level mathematics (Umoh, 1994). This study found that age, gender and parents' education were not significantly related to retention in this group.

At MCC, entry into remedial courses is based on MAPS assessment tests and a writing test. Depending on the results of these tests, advisors may recommend enrollment in one or all of these courses: Preparing for College Reading I or II, Introductory Writing, and Fundamentals of Mathematics. In order to obtain demographic information on

students taking remedial courses, and to evaluate the impact of remedial course work on student success, a cohort study was conducted including students who matriculated at MCC in the Fall of 1995.

Methods

In the Fall of 1995, 1472 MCC students filled out new student information forms at orientation providing information such as gender, age, ethnicity, and socioeconomic status. Of these 1472 students, 1077 (72.3%) were first-time freshmen, 190 (12.8%) were readmitted students and 223 (15.0%) were transfer students. This study is restricted to 1077 first-time freshman who matriculated in the Fall of 1995 and who tested into at least one remedial course. Students were categorized by test status according to results received on MAPS assessment tests and a writing test. It is recommended that students testing into remedial courses take them during the first semester prior to attempting college-level work. Students who took remedial courses but not in the first semester were excluded from the analysis.

Student success was evaluated using cumulative GPA as of Spring 1997; GPA was dichotomized into "passing" (greater than or equal to a 2.0) or "failing" (less than a 2.0). GPA's of students taking remedial courses during the first semester were compared to those who did not take remedial courses. The relative risk statistic was used to represent the incidence rate of good academic standing in those who took remedial courses in the first semester compared to the incidence rate of good academic standing in those who did not take remedial courses. The impact of continuous variables such as age were assessed using Student's t-tests for independent samples and one-way anovas. Finally, retention of 98 students matriculating in the Fall of 1995 who tested into and took all three remedial courses was evaluated stratifying by gender and ethnicity.

Results

Enrollment in Remedial Courses

Table 1 describes the percentage of students who tested into remedial courses but who did not enroll during the first semester, as well as the percentage of students never enrolling in these courses.

Table 1. Remedial Courses Taken by Students As Recommended

	Not Taken	Taken First Semester	Total Testing Into
Introductory Writing	27 (10.4%)	233 (89.6%)	260
Preparing for College Reading I or II	92 (31.3%)	202 (68.7%)	294
Fundamentals of Mathematics	69 (26.1%)	195 (73.9%)	264
	Not Taken	**Taken Any Semester**	
Introductory Writing	27 (9.3%)	264 (90.7%)	291
Preparing for College Reading I or II	92 (28.9%)	226 (71.1%)	318
Fundamentals of Mathematics	69 (21.3%)	255 (78.7%)	324

Table 2 considers the impact of gender and ethnicity on the likelihood of taking remedial course work during the first semester among students testing into these courses. Comparing female students to male students, 4.7% more women than men failed to take either Preparing for College Reading I or II as recommended. This gap widens with Fundamentals of Mathematics; in which case 6.3% more women (as compared to men) failed to take this course when recommended by an advisor. White and non-white students vary in taking remedial courses when these courses are recommended. White and non-white students are equally as likely to take Fundamentals of Mathematics. However, almost 40% of the non-white students testing into Preparing for College Reading I or II did not take these courses, as compared to 27.8% of the white students $p<.07$). These exploratory findings suggest that ethnic differences or counseling patterns may influence whether students take remedial courses. No relationship was found between the level of education of either parent and taking remedial courses. **Table 3** displays a significant relationship between age and years since high school, and taking remedial courses. Students who were older with more years out of high school demonstrated greater reluctance to take Fundamentals of Mathematics.

Table 2. Gender and Ethnic Differences Among Students Not Taking Remedial Courses During the First Semester

	Male	Female	Sig.
Introductory Writing	16/153 (10.5%)	11/107 (10.3%)	
Preparing For College Reading I or II	46/157 (29.3%)	46/137 (33.6%)	
Fundamentals of Mathematics	28/122 (23.0%)	41/142 (28.9%)	
	White	**Non-white**	
Introductory Writing	19/193 (9.8%)	4/32 (12.5%)	
Preparing For College Reading I or II	56/201 (27.8%)	22/56 (39.3%)	$p<.07$
Fundamentals of Mathematics	47/188 (25%)	10/41 (25%)	

Table 3. Mean Differences in Age and Years Since High School Among Students Taking and Not Taking Remedial Courses During the First Semester

Taking Class as Recommended	Age	Years Since HS
Took Introductory Writing	20.12	1.39
Did Not Take Introductory Writing	21.16	1.35
Took Preparing For College Reading I or II	19.6	1.02
Did Not Take Preparing For College Reading I or II	20.9	1.78
Took Fundamentals of Mathematics	20.19*	1.86**
Did Not Take Fundamentals of Mathematics	23.23*	4.06**
	*=p<.000	**=<.015

In order to evaluate the impact of remedial course work, first-time freshmen testing into any remedial course were included in an analysis comparing cumulative GPA between students taking recommended remedial courses and those not taking these courses. GPA was dichotomized into greater than or equal to 2.0, or less than 2.0. Relative risks were stratified by gender and ethnicity.

Table 4 describes the relationship between academic success, course, gender and ethnicity. The chance of academic success (GPA equal to or above 2.0) is greatest among students who tested into Preparing for College Reading I or II and who took one of these courses. Students who took this course were 1.420 times more likely to achieve a GPA above a 2.0 than those students who did not take one of these courses (CI 1.121-1.798, significant). This relationship intensified upon stratification by gender. Women who took this course were 1.755 times more likely to earn a GPA above a 2.0 than women who did not take the course (CI 1.142-2.696, significant). Students testing into Fundamentals of Mathematics who took this course were 1.308 times more likely to achieve a GPA above a 2.0 than students who did not take this course (CI 1.103-1.551, significant). Again, this relationship intensified upon stratification by gender. Female students who took Fundamentals of Mathematics were 1.442 times more likely to earn a GPA above 2.0 than those who did not take the course (CI 1.130-1.840).

Table 4 also shows how gender and ethnicity together influence academic outcomes of remedial students. Both white and non-white females were more likely to succeed than their male counterparts upon taking Preparing for College Reading I and II as recommended. White female students taking this course as recommended were 1.642 times more likely to achieve a GPA above a 2.0 (CI 1.019-2.647, significant) than white female students not taking the course. Non-white female students taking this course were 3.611 times more likely to achieve a GPA above a 2.0 than non-white females who did not take this course, although this finding was not significant.

Table 4. Chances of Academic Success Among Students Taking Remedial Courses During the First Semester

	Crude RR	White	Non-white	Male	Female
Introductory Writing	1.030 (.917-1.156)	1.002 (.893-1.125)	1.345 (.598-3.022)	1.058 (.913-1.226)	1.383 (.192-9.938)
Preparing For College Reading I or II	1.420 (1.121-1.798)	1.444 (1.118-1.865)	1.833 (.817-4.115)	1.239 (.942-1.631)	1.755 (1.142-2.696)
Fundamentals of Mathematics	1.308 (1.103-1.551)	1.327 (1.094-1.611)	1.172 (.713-1.926)	1.150 (.914-1.446)	1.442 (1.130-1.840)
	Crude RR	**White Female**	**Non-white Female**	**White Male**	**Non-white Male**
Introductory Writing	1.030 (.917-1.156)	.961 (.793-1.164)		1.029 (.882-1.187)	1.324 (.584-3.001)
Preparing For College Reading I or II	1.420 (1.121-1.798)	1.642 (1.019-2.647)	3.611 (.611-21.33)	1.364 (1.017-1.830)	1.259 (.538-2.949)
Fundamentals of Mathematics	1.308 (1.103-1.551)	1.593 (1.174-2.160)	1.067 (.664-1.712)	1.102 (.870-1.392)	

Enrollment in More than One Remedial Course: Descriptive Statistics

In order to describe students taking more than one remedial course during the first semester of the freshman year, student enrollment information was obtained from registration data. Students taking all three remedial courses are equally split between genders (49 men and 49 women). The mean age of this group, 19.89, did not vary significantly by gender. Marital status was available for 73 or 74.5% of the study subjects. Four of the students (4.1%) were (or had been) married. Remaining students were single.

Secondary Education

Information on high school status was available for 71 or 72.4% of these students. Six or 6.1% had received GED certificates and 65 or 66.3% were high school graduates. More than half of the students (53.1%) taking three remedial classes graduated from high school in the previous spring. A total of ten students (10.2%) graduated from high school within the past five years, and three students (3.0%) graduated from high school 14 or more years ago. Information was not available on this factor for about one-third of the student subjects.

Academic Information

Information on language was available for 73 or 74.5% of the study subjects. English was the second language for 9 or 9.2% of the study subjects. Remaining subjects were either native English speakers or did not provide this information. Information on learning disabilities was available for 69 or 70.4% of the study subjects. Twenty-three or

23.4% of the study subjects reported some type of learning disability. Remaining subjects either did not have a disability, or did not report this information.

Educational Goals

Information on educational objectives was available for 74 or 75.5% of the 98 remedial students. Over 30% of the students in this group were interested in transferring to a four-year college and over 20% were interested in job training. The orientation form also asked about the highest degree planned. Information on educational aspirations was available for 67 or 68.4% of these students. A total of 31 or 31.6% of these students planned to obtain a four-year degree, and 14 or 14.3% planned to pursue graduate studies. These data suggest that students taking all three remedial courses in one semester are highly motivated.

Education and Profession of Parents

Nine or 9.2% of mothers and 12 or 12.2% of fathers had not earned a high school diploma. Thirteen or 13.1% of mothers and 14 or 15.3% of fathers had earned at least a Bachelor's Degree.

Table 5. Educational Level of Parents

Parent	Mother	Father
Not a High School Graduate	9 (9.2%)	12 (12.2%)
High School Diploma	27 (27.6%)	23 (23.5%)
Vocational or Technical School Certificate	3 (3.1%)	3 (3.1%)
Some College Courses	2 (2.0%)	4 (4.1%)
Associate Degree	6 (6.1%)	5 (5.1%)
Bachelor's Degree	7 (7.1%)	11 (11.2%)
Graduate Degree	6 (6.1%)	4 (4.1%)
Missing	38 (38.8%)	36 (36.7%)
Total	98	98

Table 6. Professional Level of Parents

	Mother	Father
Unknown	24 (24.5%)	17 (17.3%)
Business/Government	8 (8.2%)	15 (15.3%)
Health Professional	13 (13.3%)	3 (3.1%)
Helping Professional	2 (2.0%)	2 (2.0%)
Civil Service		3 (3.1%)
Mechanic/Technician	3 (3.1%)	9 (9.2%)
Trade	6 (6.1%)	12 (12.2%)
Clerical	12 (12.2%)	6 (6.1%)
Communications	2 (2.0%)	1 (1.1%)
Retired/Disabled	3 (3.1%)	6 (6.1%)
Missing	25 (25.5%)	24 (24.5%)
Total	98 (100%)	98 (100%)

Table 7 below lists the intended programs of the 98 remedial students. Close to one-quarter of the students are enrolled in LATCH, a program which seeks to provide academic and personal support to students who may lack the skills to succeed in an academic or a career program at Massasoit.

Table 7. Students Taking Three Remedial Courses, by Program

Program	N	%
Business Administration Career	5	6.3
Business Administration Management	3	3.8
Business Administration Human Resources	1	1.3
Travel and Tourism	1	1.3
Computer Information Services	1	1.3
Electronic Technology	4	5.1
Electro-mechanical Technology	1	1.3
Child Care Education	1	1.3
Culinary Arts	1	1.3
LATCH	22	27.8
Liberal Arts Studies	18	22.7
Liberal Arts Media	2	2.5
Liberal Arts Transfer	7	8.8
Law Enforcement	10	12.6
Law Enforcement Transfer	1	1.3
Human Services	1	1.3
	79	100.0

Academic Success

In order to describe the academic success of students taking multiple remedial courses, GPA's were obtained for 98 students for Fall of 95, Spring of 96, and Fall of 96. Information on enrollment was obtained from student records for Fall of 95, Spring of 96, Fall of 96, and Spring of 1997. Student status was evaluated after the Fall of 1995, the Spring of 1996, the Fall of 1996, and the Spring of 1997.

The Fall of 1995 was the last semester for 24 or 24.5% of the students; the Spring of 1996 was the last semester for 24 or 24.5% of the students; the Fall of 1996 was the last semester for 18 or 18.4% of the students. In the Spring of 1997, only 32 or 32.7% were still enrolled, and the remaining 66 or 67.3% were not enrolled. After three semesters 67.3% of the 98 students testing into and taking three remedial courses were no longer attending Massasoit.

Retention

According to this study, 51% of the first-time freshmen testing into and taking all three remedial courses returned after one year. According to previous institutional studies, 69% of full-time first-time freshmen, remedial and non-remedial, return after one year.

Presence or absence in the Spring of 1997 was evaluated in its relationship to gender and ethnicity. **Table 8** shows that female students were more likely to withdraw than male students during the course of the three follow-up semesters. In addition, white students were more likely to withdraw than non-white students during the course of the three follow-up semesters.

Table 8. Percent of Students Enrolled in the Spring of 1997 by Gender and Ethnicity First Semester Freshmen Taking Three Remedial Courses

	gender		ethnicity	
enrollment in Spring of 1997	**Female**	**Male**	**White**	**Non-white**
yes	14 (28.6%)	18 (36.7%)	21 (33.3%)	11 (40.7%)
no	35 (71.4%)	31 (63.3%)	42 (66.7%)	16 (59.3%)
	49	49	63	27

Information on gender and ethnicity was available for 90 out of 98 of the students taking three remedial courses. **Table 9** below shows that when gender and ethnicity are considered together, non-white male and female students are more likely to succeed after several semesters of remedial course work than white male and female students.

Table 9. Percent of Students Matriculating in the Spring of 1997 by Gender and Ethnicity Combined First Semester Freshmen Taking Three Remedial Courses

	gender and ethnicity			
enrollment in Spring of 1997	White Female	Non-white Female	White Male	Non-white Male
yes	8 (27.6%)	6 (35.3%)	13 (38.2%)	5 (50.0%)
no	21 (72.4%)	11 (64.7%)	21 (61.8%)	5 (50.0%)
	29	17	34	10

Conclusions

In this present study of first-time freshmen at Massasoit Community College, we found that up to 31.3% of first-time freshmen did not take Preparing for College Reading I or II as recommended and that 26.1% of first time freshmen did not take Fundamentals of Mathematics as recommended. Our study shows that female students and non-white students are less likely to take remedial courses as recommended. A significant relationship was found between ethnicity and not taking Preparing for College Reading I or II. A significant relationship was found between increased age and years since high school and lack of willingness to take Fundamentals of Mathematics.

Table 4 shows that students who take the recommended remedial courses are more likely to achieve higher GPA's than those who do not. A statistically significant positive relationship was found between academic success (GPA 2.0 or above) and taking Preparing for College Reading I or II, or Fundamentals of Mathematics. This positive relationship increased when only female students were considered.

GPA has limitations as an outcome variable because a higher GPA may only reflect the grades achieved in easier remedial work. Academic success can also be evaluated by matriculation in succeeding semesters. When 98 first-time freshmen testing into and taking all three remedial courses were followed over three semesters, 67.3% did not matriculate in the Spring of 1997. The withdrawal rate was lowest among non-white students (59.3%). This finding suggests that remedial education at the post-secondary level is extremely important to minority students, and that student success may be increased if non-white students enroll in remedial courses.

Limitations

Information on matriculation in successive semesters was not available for students taking fewer than three remedial courses. Ongoing analyses will evaluate retention and graduation rates of students taking varying numbers of remedial courses.

This study compared students taking remedial courses as recommended during the first semester of matriculation with those students who did not take remedial courses as

recommended during the first semester. Future studies will compare the academic outcomes of students who took remedial courses and who did not take remedial courses.

A discussion on the impact of ethnicity on academic success is limited due to the small number of minority students in the sample. Consequently, many different minority groups were grouped into the non-white category. The category of non-white may have included students for whom English is not the primary language. The presence of such students in the non-white category may have biased the results toward the null.

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ASSESSING RISK:
THE DARTMOUTH COLLEGE STUDENT RISK BEHAVIOR SURVEY

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College is a time of opportunity and risk. Most students attending a four-year residential college lose the checks on their behavior previously made by parents. With parental influences reduced, students have greater freedom and the increased probability that students will engage in risky behaviors.

There have been a number of attempts to gather information about specific risky behaviors. Most risk research has addressed alcohol use, particularly since the advent of the Drug-Free Schools and Communities Act of 1989, which requires schools to assess their alcohol prevention activities on a biannual basis. Three widely-know research programs have assessed alcohol use and its consequences on a national level.

Monitoring the Future (*MTF*) has surveyed college students since 1980 (Johnson, O'Malley, and Bachman, 1996). This longitudinal study has documented usage as well as perceptions of alcohol and other drug use, in the college and non-college populations, by following high-school students in their post-high school years.

The *Core Drug and Alcohol Survey* , an instrument developed under federal funding by FIPSE (Fund for the Improvement of Post Secondary Education) grantees, has been used by hundreds of colleges with FIPSE funded alcohol and other drug prevention programs and has an extensive data base of over 70,000 students (Presley, Meilman, & Cashin, 1996). In the past two years, the instrument was offered in both a "long" and "short" version. The short version was the original version of the *Core* instrument, and the long version added another 2-pages of additional questions. The *Core* asks similar questions to *MTF* about usage of alcohol and other drugs and the negative consequences which can arise from such use, while adding a few questions about violence on campus.

The *Harvard College Alcohol Study* (Wechsler, 1994) was administered on a national scale out of the Harvard School of Public Health. While alcohol behaviors and attitudes were the focus of this study, other drug usage was included as well.

Of these three instruments, only the *Core* is available as a service to colleges who wish to examine their own campuses. As more colleges examine alcohol and other drug issues, there has been an increased interest in surveying students on these matters.

In addition, college administrators and researchers increasingly find that alcohol is only one component of risky college behavior. Drugs, sexual assault, eating disorders, and suicide are all issues of concern on campus. These other risky behaviors are only tangentially, if at all, addressed by the current instruments with two exceptions: the

Center for Disease Control's (CDC) *College Health Risk Behavior Survey* (Douglas, Collins, Warren, Kann, Gold, Clayton, Ross, & Kolbe, 1997) and the *Dartmouth College Student Risk Behavior Survey.*

The CDC survey, which collected data in 1995 from 4,609 undergraduate students at 136 colleges across the country, examines alcohol and other drug usage, intentional (including suicide) and unintentional injury, sexual behavior, dietary behaviors, and physical activity. While the instrument is available to the public, the CDC does not provide any services with its use.

Before developing the *Dartmouth College Student Risk Behavior Survey*, the CDC survey was examined and rejected for our purposes. While the instrument ties together a number of risk behaviors, it focuses on a broad variety of behaviors with little examination of consequences or the reasons behind the behaviors. We wanted an instrument that would provide a full-range of description of the problems associated with risky behaviors, as well as examine some of the reasons why students engage or do not engage in risk. The *Dartmouth College Student Risk Behavior Survey* was designed to provide information to health education practitioners who need information for prevention and education messages It was also designed for college administrators, faculty, and directory boards such as trustees, who are interested in understanding college student behavior, examining trends, and allocating resources to specific problem areas.

The *Dartmouth College Student Risk Behavior Survey* examines alcohol behaviors (including use and consequences of use); marijuana, tobacco, and other drug use; reasons to use and not use alcohol; sexual behavior, including number of partners, reasons to have and not have sex, and protection in sex; suicide; and binge eating. The survey also asks students their views on alcohol policy, and gathers data concerning knowledge of and attendance at education and prevention programs. The instrument measures the wide variety of risk-behavior issues, and allows correlations between the behaviors.

Method

Instrument

The *Dartmouth College Student Risk Behavior Survey* was developed with an eye towards the utility of comparative national data. In many cases, although our data can be compared to national norms, our questions provide more detailed information. Nowhere is this more evident than in our assessment of drinking behavior over the last two weeks. Whereas most surveys ask only for the student to determine how many times in the past two weeks he or she has had five or more drinks in a sitting (what has been termed "binge" drinking), the *Dartmouth College Student Risk Behavior Survey* asks students to report how many drinks they have had for each day in the past two weeks. Extensive pilot testing indicated correlations of over .90 between the two methods to assess "binge

drinking." Other questions addressed issues which arose out of focus groups with students on the alcohol culture in college and discussed findings from previous surveys.

Content validity was addressed by consulting with experts in the various college student risk behaviors . Internal consistency reliability was examined using Chronbach's alpha with the following results: knowledge of topics (.87), problem assessment (.86), past two weeks alcohol consumption (.87), consequences of alcohol use (.90), reasons to drink (.62), reasons not to drink (.44), reasons to have sex (.79), reasons not to have sex (.68), attending prevention groups (.84), and alcohol policy (.77).

The instrument was pilot tested and converted into two formats: a scannable "bubble" form, and a web version. Previous research (Pryor, 1996) indicates that the two methods elicit similar results and the choice of one or the other does not bias the results.

Procedure

A random sample of 1,000 undergraduates from a four-year private school in the Northeast, stratified by year in school and racial/ethnic group, received the scannable form of the survey via campus mail. Each student also received the url for the web version of the survey, and was told in the cover letter that they could chose either method of submitting their results. Web respondents were verified as part of the sample by their campus e-mail id and password. Multiple entries over the web were not permitted.

The initial mailing took place one month into the spring term of 1996, in March. An e-mail reminder was sent three days after the mailing went out. Two subsequent paper mailings were sent to non-respondents three and six weeks after the initial mailing. Surveys were confidential and anonymous (e-mail ids and passwords used to verify membership in the sample were compared via computer and stripped from the database without being seen by the research staff), and non-respondents were tracked by having respondents return a response post-card, separately from the instrument. This post card was also used in a drawing for prizes for the respondents as an incentive.

Results

Response Rate and Demographics

Four hundred and forty-four students returned completed questionnaires, for a response rate of 45%. The web administration proved to be more popular, with 268 (60%) choosing this method and 178 choosing the paper and pencil form (40%). Slightly more females (54% respondents, 48% sample) than males (46% respondents, 52% sample) responded, as well as slightly more first-year students (39% vs. 30%), versus seniors (22% vs. 27%) with sophomores (23% vs. 20%) and juniors (21% vs. 20%) equally represented in the respondent pool. There was no significant response bias by race/ethnicity, and our sample included 72% White/Caucasians, 10% Asians, 5% African

American/Black, 3% Latino, 1% Native American, and 10% other or non-respondent to the question. Results were statistically weighted by sex and class to mirror the total student body enrolled and on campus during the spring term.

Main Findings

Alcohol

Most students described themselves as light (39%) or moderate (38%) drinkers, and less frequently as abstainers (16%) or heavy drinkers (7%). The average amount of drinks per week was 9, and varied for the above self-designated labels: abstainer, 0 drinks per week; light drinker, 3; moderate drinker, 13, and heavy drinker, 37.

Those drinking at the "binge" rate, using the 5 or more drinks on a day definition, were 42%, approximately the national norm reported by most surveys. However, since we are also able to compute a "binge" rate using any criteria, we can see the more complex pattern of drinking behavior in the table below, which gives the percent "bingeing" using criteria from 1 to 10 drinks.

Drinks	1	2	3	4	5	6	7	8	9	10
%	75%	64%	59%	51%	42%	34%	27%	23%	17%	16%

Reasons Not To Drink

The most prevalent reasons not to drink were interference with school work, negative effects of health, and worrying about loss of control.

58.3%	It interferes with my school work
44.5%	I am worried about the negative effects of alcohol on my health
39.9%	I don't want to lose control
31.5%	I don't like the taste
26.6%	It interferes with my athletic activities
19.3%	I don't like the way I act when drinking
14.8%	My personal values are against alcohol use
13.2%	I am not of legal age to drink
13.0%	I don't like being around others who are drinking
9.2%	I have a parent or a close relative who is an alcoholic
6.7%	My friends don't drink
6.2%	My girlfriend/boyfriend would disapprove
4.6%	I am worried about being caught by college authorities
2.4%	My religion forbids alcohol use
2.3%	My friends would disapprove
0.8%	I am in recovery from alcohol use

Of interest to educators will be that there were significant differences in reasons not to drink between students who were heavy episodic drinkers (5 or more drinks on a day at least twice in the past two weeks) and those who were non drinkers. While interference with school work was the most oft given reason not to drink for the heavy episodic drinkers, the most prevalent concern of the non drinkers was loss of control, followed closely by personal values.

Reasons To Drink

The most important reasons to drink were also examined. Most prevalent was to have a good time, followed by relaxing, and to feel good.

74.8%	To have a good time with my friends
57.1%	To relax or relieve tension
51.8%	To feel good or get high
44.7%	Because it tastes good
38.2%	As a reward for working hard
15.1%	Because of boredom, nothing else to do
13.0%	To experiment -- to see what it is like
11.3%	To get away from my problems or troubles
7.9%	To fit in with a group I like
7.1%	Because of anger or frustration
4.3%	To get to sleep
3.5%	To increase the effect of another drug
2.6%	To seek deeper insight or understanding
1.5%	Because I need to have a drink
0.9%	To get through the day
0.0%	To decrease the effect of another drug

We again compared two different groups of students: the heavy episodic drinkers with those who reported drinking only a few times in the past year. One of the biggest differences between these groups was how many felt that an important reason for their drinking was a reward for working hard, 71%, versus the infrequent drinkers, 22%.

Consequences of Alcohol Use

The *Dartmouth College Student Risk Behavior Survey* revised and expanded a set of consequences which have been used in some form in all the major alcohol surveys. The new set of questions goes into more detail in some areas our focus groups told us were of concern but were not current being measured. These would include public

urination (exhibited by 20% of students in the past year), deliberately vomiting so one could drink more (11%), and picking up (or "hooking up with") a new sexual partner (29%). Due to space limitations, only a few of the 36 consequences in the survey are included here.

	Total for the Past Year
	%
Had a hangover	62.8
Hooked up with a new sexual partner	29.2
Vomited in a private setting (like a bathroom)	51.4
Vomited in a public setting	18.7
Deliberately vomited so you could drink more	10.9
Urinated in a public setting	20.3
Played drinking games	62.2
Got into an argument or fight	13.2
Driven a car while under the influence	9.4
Hung out with people you would not hang out with if not drinking	24.3
Drank more alcohol than you wanted to due to pressure from others	11.1
Missed a class	21.4
Been criticized about your drinking by someone you know	14.7
Thought you might have a drinking problem	6.4
Forgotten what happened when you were drinking (blacked out)	26.8
Done something you later regretted	24.6
Been arrested for DWI/DUI	0.4
Had sexual intercourse when ordinarily wouldn't	6.8
Failed to use safe sex practices when ordinarily would	3.6
"Gone further" sexually when ordinarily wouldn't	13.2
Have been taken advantage of sexually	8.4
Have taken advantage of another sexually	2.0

Tobacco

Almost half of our sample had smoked cigarettes in the past year, and 12% were daily smokers. In a question examining behaviors which only occur under the influence of alcohol, half the smokers reported that they only smoked when drinking.

Other Drugs

The following data were obtained for drugs other than tobacco and alcohol. The most prevalent illegal drug used besides alcohol was marijuana, with 34% having smoked at least once in the past year.

	Never	Once	More Than Once
	%	%	%
Marijuana	65.8	10.0	24.2
Psychedelic Mushrooms	91.3	4.4	4.3
Inhalants	93.0	2.5	4.6
LSD	96.5	1.6	2.0
Ecstasy	97.1	1.1	1.7
Other Psychedelic drug	97.9	0.9	1.2
Cocaine	98.3	0.7	1.0
Heroin	99.5	0.2	0.3
Crack	99.7	0.3	0.0
Ice (crystallized methamphetamine)	99.7	0.3	0.0
Steroids	100	0.0	0.0

Sexual Behavior

Over half (54%) of students reported having had sexual intercourse with at least one person of the opposite sex in the past year. Most of these, 34% of the total group, had had sex with only on partner. Eleven percent of the total sample had had sexual intercourse only once in the past year, with 19% doing so 51 or more times. More seniors (66%) and juniors (60%) reported having sex than did sophomores (47%) and first-year students (37%).

Of the sexually-active students, only 49% reported that they always used a condom when having sex. Although one would hope that this percent would rise when examining students with multiple partners, in fact the opposite occurs, with only 39% of those students who had had 3 or more partners in the past year always using condoms.

Eating Behavior

A little over one quarter (28%) of our sample reported binge eating. When we examined those who ate at this level and reported either being worried about the behavior, or if they though it was out of control, the number dropped to 13%.

Suicide

Four questions addressed aspects of suicide: ideation, making a plan, attempting suicide, and if they had worried that a friend might have ever committed suicide. While

29% had worried that a friend might commit suicide, 10.6% admitted suicide ideation, 2.8% had made a plan to commit suicide, and 1.5% reported attempting suicide.

Education/Prevention Groups

About as many students reported attending a program on alcohol at some point in the past year (17%) as one on sexual assault (15.8%). The sexual assault programs were also more likely to have students recommending them (51% versus 37%).

	Not Heard About Any Programs	Heard About Program - Did Not Attend	Attended Program	Attended, Would Recommend
	%	%	%	%
Alcohol	26.4	56.3	17.3	37.0
Sexual Assault	14.4	69.8	15.8	51.4
Sexuality	28.4	60.4	11.3	49.9
General Health/Wellness	37.4	52.2	10.3	29.8
Nutrition	35.9	55.0	9.1	32.8
Relationships	52.9	38.8	8.4	39.6
Eating Disorders	24.3	67.6	8.1	49.7
Drugs	65.0	30.6	4.4	48.7
Marijuana	75.5	20.4	4.1	42.0

Alcohol Policy

While 38% felt that the school's current alcohol policy was too strict, 39% thought it was about right, and 10% thought it was too lenient. Most students reported that they knew about the policy on underage drinking, although only one-quarter reported that they followed the policy. Most, 72%, did not support enforcement of this policy.

Risk Assessments

One of the advantages of the *Dartmouth College Student Risk Behavior Survey* is that it can be used to assess multiple risks. Dichotomous variables were created for each risk category to determine if a students were at risk or not for that particular behavior.

Risk	Criteria
Alcohol	5 or more drinks on at least 2 days in the past two weeks
Marijuana	Used more than once in the past year
Tobacco	Daily use
Sexual Behavior	More than one partner in a year and don't always use a condom
Eating Behavior	Binge eat monthly and worried or think behavior is out of control
Drugs	Any illegal drug use (besides marijuana) in the past year
Suicide	Any instance of suicide ideation, planning, or attempts

Using these criteria, 59% of students were at risk for some behavior. Close to one-quarter were at risk for one factor (22%), 13% had two risk factors, 7% were at risk in three areas, 3% in four areas, and 2% in five areas.

Risk	Percent At Risk
Alcohol	22%
Marijuana	22%
Drugs	14%
Sexual Behavior	13%
Eating Behavior	13%
Tobacco	11%
Suicide	11%

We used logistical regression to examine group differences (sex, race, fraternity/sorority membership, varsity athletic participation, class, residence type, grade point average, and if the student grew up in an urban, rural, or suburban environment).

For alcohol, more males (32%) than females (12%) were at risk; more juniors (27%) than seniors (22%), sophomores (20%) or first-years (20%); and more fraternity and sorority (F/S) members (39%) than non-members (14%). There was a significant interaction by F/S membership and sex with male members at the highest risk (64%), male non-members (16%), female members (12%), and female non-members (12%).

For marijuana, the only group difference was between athletes, with 27% of those not participating in varsity athletics at risk, 13% of those players who were not team leaders at risk, and none of the team leaders at risk.

For other drugs, males were significantly more represented in the "at risk" group: 19% versus 10% for females. In addition, there was a significant difference by residence. One third of those living in a fraternity or sorority exhibited risky drug behavior, as opposed to 25% in off-campus apartments, 14% in on-campus apartments, and 10% in the residence halls.

Fraternity and sorority members exhibited more risky sexual behavior, with 22% of that group at risk versus 8% of non members.

Finally, more women were risky eaters, with 20% at risk versus only six percent of the men. Those living in fraternity or sorority houses were more at risk (23%) than those living in on-campus apartments (15%), residence halls (12%), or off-campus apartments (10%). There was a significant interaction between sex and racial/ethnic group in that white females exhibited risky eating behavior at 23%, women of color at 11%, men of color at 10%, and white males at 4%.

There were no group differences for the tobacco or eating risk factors.

Statistically significant correlations at the .05 level were found between most of the risk factors, although to a varying degree of association. The highest correlations were between marijuana and other drug risk ($r=.49$, $p < .05$), marijuana and tobacco risk ($r=.42$, $p < .05$), and tobacco and drug risk ($r=.41$, $p < .05$). Drug risk was also significantly correlated with alcohol risk ($r=.33$, $p < .05$), and sexual risk ($r=.11$, $p < .05$); marijuana risk was also linked with alcohol risk ($r=.33$, $p < .05$). Alcohol was also correlated with sexual risk ($r=.17$, $p < .05$). Suicide was only correlated with sexual risk ($r=.11$, $p < .05$).

Discussion

The *Dartmouth College Student Risk Behavior Survey* has several advantages over existing instruments. In-depth information of relevance to both policy makers and prevention practitioners is available on a variety of the most risky behaviors exhibited by college students. Since these risk behaviors have been captured in one instrument, the relationships between risky behaviors, such as alcohol and sexual behavior, can be examined. Many findings from previous research, such as the increased frequency of heavy drinking found in fraternity and sorority members (Wechsler et al, 1994) were replicated with our instrument. In addition, the instrument allowed us to specifically connect alcohol, drug, and suicide risk with sexual risk. Further research will refine the instrument and examine correlations between the risk behaviors in greater detail.

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TRENDS IN GRADUATION RATES AT STATE COLLEGES AND UNIVERSITIES: RESULTS FROM THE AASCU/SALLIE MAE NATIONAL RETENTION PROJECT

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Introduction

Launched in 1991 through a grant from the Student Loan Marketing Association (Sallie Mae), the AASCU/Sallie Mae National Retention Project (NRP) was designed to engage college and university presidents and chancellors in leading their campuses to improve student retention and graduation rates, especially the rates of racial/ethnic minority students. Under the NRP, AASCU member colleges are surveyed each year and asked to report their six-year graduation rates for full-time, full-year, degree-seeking students who entered as freshmen. The survey also asks the respondents to rate their views on administrative, academic, and assessment conditions that might affect these graduation rates.

This paper describes the National Retention Project, the survey instrument, and other Project activities. The report also provides trends in the graduation rates of survey respondents from 1993 to 1996, and summarizes information on the administrative, academic advising, and assessment conditions that might influence graduation rates at these colleges.

The National Retention Project

The NRP focuses on academic institutions as the object of inquiry, rather than on student behavior. Richard C. Richardson=s and Vincent Tinto=s studies of the effect of campus culture on retention have guided Project planning. The annual survey has been informed by Richardson=s three stages of institutional evolution in addressing student retention. These stages are: Reactive, focusing on recruitment, financial aid, admissions and scheduling; Strategic, focusing on outreach, transition, mentoring, enrollment, and residence hall activities; and Adaptive, focusing on student assessment, offering learning assistance if needed, and adapting curricular content to embrace the variety of learning styles inherent in diverse student bodies. The adaptive stage is considered the most advanced, integrative stage.[1] The Project's fundamental premise is that student success is the responsibility of everyone on campus, and that the burden of improvement should not rest with the student alone.

[1] R. C. Richardson, Jr., "A Model of Institutional Adaptation to Student Diversity," in *Achieving Quality and Diversity*, New York: ACE/Macmillan, 1991.

Under the NRP, AASCU has administered five annual graduation rate surveys to member colleges. These institutions are provided with feedback reports that compare their rates with their peer institutions, based on campus enrollment size and geographic location. Additionally, AASCU members have also participated in activities designed to raise awareness about student persistence issues and to assist presidents and their campuses in addressing related problems.

The NRP also has supported nine regional working conferences and five sessions at national meetings focused on student retention. In addition, the project has sponsored five publications, two national videoconferences on PBS, and two special projects designed to help campuses with relatively low six-year graduation rates to improve their student outcomes.

The AASCU/SALLIE MAE National Retention Survey

AASCU has administered the survey to about 400 colleges each year since 1992. The survey instrument is comprised of two parts. The first seeks information about state and campus academic and administrative conditions that might affect retention,[2] and the second solicits data about student outcomes.

The first NRP survey solicited retention data--the number of students retained from first to second semester, from the freshman to sophomore year, etc.—only to find so much variance between campuses' methods of tracking this information that comparisons were not possible. For this reason, AASCU researchers opted to use the six-year graduation rate as a proxy for retention in subsequent survey years.[3] These rates are based on the number of first-time, full-time, full-year, degree-seeking freshmen who graduate within six years of entering college.

Since this format was introduced, survey responses rose from 188 (or 50 percent of member colleges) in 1993 to 290 (75 percent) in 1996. Similarly, the number of campuses that provided usable six-year cohort graduation rate data for first-time, full-time, degree-seeking students by sex and race/ethnicity grew from 63 percent of respondents in 1993 to 76 percent in 1996. Over the study period, the number of students represented in the respective full-time, first-time degree-seeking freshmen cohorts has increased from 121,903 in 1993 to 229,875 in 1996.

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[2] This portion of the survey draws from R.C. Richardson, Jr., D. A. Matthews, and J. E. Finney, *Improving State and Campus Environments for Quality and Diversity: A Self-Assessment.* Denver: Education Commission of the States, 1992.

[3] President Harley Flack of Wright State University (OH) suggests that this choice disadvantages campuses that serve large numbers of part-time or adult students who may enroll intermittently or do not intend to complete a bachelor's degree. President Flack calls for a change in the paradigm of retention in favor of an approach that uses multiple, non-traditional measures such as assessment of learning outcomes and benchmarking according to institutional mission.

Overall six-year graduation rates did not change appreciable during the study period, probably due to the expanding number of universities responding to the survey and to the short time period that the Project covers. As Table 1 shows, the average graduation rate has increased slightly—from 40.6 percent in 1993 to 42.7 percent in 1996. Table 1 also reports the number of survey respondents, response rates, and the average six-year graduation rates by sex and race/ethnicity from 1993 to 1996.

Table 1. Six-year Graduation Rates for First-Time, Full-Year, Full-Time Freshmen in Degree-Seeking Programs

	1993 (Fall 1986 Freshmen Cohort)	1994 (Fall 1987 Freshmen Cohort)	1995 (Fall 1988 Freshmen Cohort)	1996 (Fall 1989 Freshmen Cohort)
Estimated Number of Surveyed Institutions	380	380	380	379
Number of Responding Institutions	188	200	258	283
Number of Responding Institutions with Usable Data	119	165	194	216
Survey Response Rate (1)[4]	49.5%	52.6%	67.8%	74.7%
Survey Response Rate(2)[5]	31.3%	43.4%	51.0%	57.0%
Six Year Graduation Rates for First-Time, Full-Time, Degree-Seeking Freshmen				
Overall	40.6%	40.8%	43.2%	42.7%
Male	36.7%	35.8%	38.6%	38.0%
Female	44.0%	43.6%	46.0%	45.3%
Non-Resident Alien	38.3%	37.1%	34.6%	36.3%
Black, Non-Hispanic	29.1%	28.1%	31.7%	30.4%
American Indian/Alaska Native	26.9%	24.6%	29.0%	28.3%
Asian/Pacific Islander	42.6%	41.4%	39.5%	40.6%
Hispanic	29.7%	29.5%	28.2%	29.3%
All Minority Students[6]	31.1%	30.1%	32.0%	31.9%
White, Non-Hispanic	43.4%	41.7%	45.6%	44.9%

AASCU also examined graduation rates by campus admissions standards. These standards were drawn from the *1996 Peterson's Guide to Four-Year Colleges*, which based institutional admissions selectivity on the high school class rankings and admission

[4] Based on the total number of responding institutions.
[5] Based on number of institutions with usable graduation rate data for first-time, full-time, degree-seeking freshmen.
[6] Does not include non-resident alien students.

test scores of the majority of freshmen students enrolled at each institution, and on the percentage of applicants admitted to the colleges.

The admissions selectivity levels of participating AASCU members, and number of 1996 survey respondents within each level, are as follows: ***noncompetitive*** (enrollment open to nearly all who apply, regardless of high school class rank or admission test scores), 20 respondents; ***minimally difficult*** (up to 95 percent of applicants accepted for admission), 30 respondents; ***moderately difficult*** (up to 85 percent of the applicants accepted), 150; ***very difficult*** (about 60 percent of applicants accepted), 4 respondents. None of the NRP survey respondents were in the ***most difficult*** category (30 percent or less of applicants accepted). Admission standards were missing for 12 of the respondents.

Admission selectivity appears to have some influence on graduation rates, as the institutions with relatively high graduation rates also had more stringent admissions criteria. As Table 2 shows, the average graduation rate in 1996 for the "very difficult" institutions was 57.9 percent, compared to 44.8 percent for "moderately difficult" colleges, and just 33.3 percent for "minimally difficult" colleges. Graduation rates for minority students were also generally higher at more selective institutions.

Table 2. 1996 Six-Year Graduation Rates for Full-Time, Full-Year, Degree-Seeking Freshmen, by Institutional Admissions Selectivity[7]

	Missing	Very Difficult	Moderately Difficult	Minimally Difficult	Non-Competitive
Institutions	12	4	150	30	20
Six-Year Graduation Rates for Full-Time, Full-Year, Degree-Seeking Freshmen					
Overall	39.1%	57.9%	44.8%	33.3%	32.8%
Men	33.7%	60.2%	40.2%	27.9%	28.5%
Women	42.3%	56.9%	47.1%	36,8%	36.5%
Non-Resident Alien	46.7%	44.4%	37.0%	35.7%	27.0%
Black, Non-Hispanic	31.1%	57.4%	31.7%	31.9%	17.0%
American Indian/ Alaska Native	7.7%	100.0%	30.3%	18.7%	21.0%
Asian/Pacific Islander	30.4%	68.3%	42.4%	26.9%	28.7%
Hispanic	29.6%	35.9%	29.5%	18.1%	24.3%
All Minority Students	30.8%	38.3%	33.3%	29.6%	19.6%
White, Non-Hispanic	43.6%	75.3%	46.9%	34.4%	35.1%

[7] Admissions selectivity standards are based on the *1996 Peterson's Guide to Four-Year Colleges.*

Sixty-two campuses responded to the survey for four consecutive years. Table 3 shows that their aggregate six-year graduation rates did not change appreciably, although there was a slight (3.8 percentage point) increase in graduation rates for Black students, and women had higher six-year graduation rates than men.

Table 3. Six-year Graduation Rates for First-Time, Full-Time, Degree-Seeking Freshmen at Institutions that Responded to the NRP Survey for Four Consecutive Years[8]

	1993	1994	1995	1996
Overall	40.2%	38.6%	40.9%	40.2%
Male	36.2%	34.1%	36.7%	35.6%
Female	43.7%	42.4%	44.3%	44.0%
Non-Resident Alien	39.0%	36.0%	33.9%	40.9%
Black, Non-Hispanic	26.9%	27.7%	29.6%	30.7%
American Indian/Alaska Native	28.2%	23.5%	29.8%	21.1%
Asian/Pacific Islander	39.3%	39.5%	40.2%	40.3%
Hispanic	28.6%	27.7%	27.5%	27.0%
All Minority Students	29.3%	29.2%	30.5%	30.6%
White, Non-Hispanic	42.5%	40.7%	43.5%	42.8%

Eight of these colleges showed steady improvement in average graduation rates during the study period. The average overall graduation rate reported by these institutions increased from 42.5 percent in 1993 to 52.8 percent in 1996 (see Table 4). The average graduation rate for minority students at these institutions increased by more than 10 percentage points, but still was much less than the rate for white students.

In addition, 32 other colleges responded every year and reported an overall increase in their total graduation rates. But rates for these institutions varied from year to year—in some years, the graduation rates increased and in others they decreased. The average six-year graduation rate for these institutions increased slightly, from 39.5 percent in 1993 to 41.3 percent in 1996. Seven of these institutions had graduation rates of 50 percent or higher. Once again, the average graduation rate for minority students at these colleges was much less than that for white students.

Twenty-three institutions reported fluctuations and drops in their graduation rates over the period, with the result that their reported rates in 1996 were lower than those in 1993. On average, fluctuations in institutional graduation rates ranged between three and five percentage points over the four years. Four institutions showed steady declines year after

[8] Based on 62 survey respondents who provided usable graduation rate data for four consecutive years of the NRP.

year, from an aggregate six-year graduation rate of 34.9 percent in 1993 to an aggregate rate of 27.6 percent in 1996.

Table 4. Six-year Graduation Rates at Institutions that Responded to the NRP Survey for Four Consecutive Years and Increased Their Graduation Rates Every Year[9]

	1993	1994	1995	1996
Six Year Graduation Rates for First-Time, Full-Time, Degree-Seeking Freshmen				
Overall	42.5%	48.2%	50.4%	52.8%
Male	37.5%	42.4%	44.8%	47.6%
Female	46.5%	52.6%	54.7%	56.8%
Non-Resident Alien	50.0%	53.8%	42.9%	42.6%
Black, Non-Hispanic	28.8%	34.0%	33.3%	36.1%
American Indian/Alaska Native	31.6%	35.7%	45.0%	39.5%
Asian/Pacific Islander	45.5%	46.0%	48.6%	53.4%
Hispanic	27.5%	35.8%	39.6%	40.8%
All Minority Students	32.1%	37.0%	32.0%	42.4%
White, Non-Hispanic	44.2%	50.1%	45.6%	55.2%

Administrative, Academic Advising, and Assessment Conditions

What conditions on these campuses might account for the fluctuating or declining rates? Without a comprehensive analysis of campus conditions and student demographics, a definite answer is not possible. However, to provide some possible clues, the NRP survey also asked institutions to describe several administrative, academic advising and assessment conditions on their campuses that might have affected graduation rates. These conditions were based on Richardson's three stages of institutional development, described earlier. Respondents indicated the extent to which these conditions described the practices at their institutions. The responses were recorded on a Likert scale, which ranked institutional self-assessments from 1 (not descriptive) to 5 (very descriptive).

To determine which of these conditions might have had a positive effect on graduation rates, the responding institutions were divided into two groups, based on their 1996 rates. Selection into the groups was based on the average and standard deviation of the graduation rates of the 1996 survey respondents. Because the average rate was about 43 percent, and the standard deviation was 13 percentage points, the "high-rate" colleges were those that had graduation rates of 56 percent or higher (43+13). Conversely, the institutions with graduation rates of 30 percent or lower (43-13) were the "low-rate" colleges.

[9] Based on eight survey respondents

Twenty-nine institutions were identified as having graduation rates of 56 percent or higher, while 46 colleges had rates of 30 percent or lower. The average graduation rate for the "high-rate" colleges was 63.6 percent, compared to 24.5 percent for "low-rate" institutions. The average graduation rate for minority students at "high-rate" colleges was 49.5 percent, versus 21 percent at "low-rate" institutions. Among white students, the average graduation rate at "high-rate" colleges was 65.5 percent, versus 25.8 percent at "low-rate" institutions.

Table 6 shows a comparison of selected campus administrative, academic advising, and assessment conditions, based on the responses between "high-rate" and "low-rate" colleges. The percentages in the table are based on the numbers of institutions in each group who said the campus conditions were "descriptive" or "very descriptive" of their colleges.

As the table shows, nearly the same proportion of "high-rate" and "low-rate" institutions--86.2 percent versus 87 percent--said that "retaining and graduating more students is one of the top three priorities of campus administrators" was descriptive or very descriptive of their campuses. However, 62 percent of the "high-rate" institutions said that "the campus meets state goals for students graduation" was descriptive or very descriptive, compared to just 17.4 percent of the "low-rate" campuses.

Several academic advising conditions also may have been indicative of institutions with high graduation rates. Over 79 percent of the "high-rate" colleges said that providing orientation programs that address issues of cultural sensitivity was descriptive or very descriptive of their campuses. This compared to about 54 percent of the "low-rate" institutions. Furthermore, 62 percent of the institutions with "high" rates said that providing an "early alert system" for students identified as being in academic difficulty was descriptive or very descriptive of their colleges. This compared to just 41 percent of colleges with lower-than-average graduation rates. And nearly 83 percent of the "high-rate" colleges said that providing community college transfer students with accurate and timely course selection and financial aid information was descriptive or very descriptive of their institutions, compared to 69.5 percent of the colleges with lower graduation rates.

On the other hand, about 80 percent of the "low-rate" colleges said that "students identified as lacking the competencies required for entry level courses receive appropriate instruction in basic skills, academic advising, and tutoring" was descriptive or very descriptive of their campuses compared to 65.5 percent of the "high-rate" institutions. However, the institutions with the higher graduation rates also had higher admissions selection criteria. Thus, there was probably a lower proportion of the students enrolled at "high-rate" institutions who required basic skills courses. This provides more evidence of the relationship between high graduation rates and admissions selectivity criteria. That is, "high-rate" institutions were able to achieve these rates because they were less likely to enroll students who needed basic skills training.

Table 5. Selected Responses to the Administrative, Academic Advising, and Assessment Conditions Section of the 1996 NRP Survey for "High-Rate" and "Low-Rate" Institutions

Campus Condition	Percentage of "High-Rate" Institutions Who Said Condition Was "Descriptive" or "Very Descriptive"	Percentage of "Low-Rate" Institutions Who Said Condition Was "Descriptive" or "Very Descriptive"
Retaining and graduating more students is one of the top three priorities of campus administrators	86.2%	87.0%
The campus meets state goals for student graduation	62.0%	17.4%
The campus provides community college transfer students accurate and timely information about course planning, financial aid, and transfer requirements	82.8%	69.5%
The campus orientation program for new students addresses issues of cultural sensitivity	79.3%	54.2%
Students in danger of failing are identified by an early alert system and receive timely advising and assistance	62.0%	41.3%
Students identified as lacking the competencies required for entry level courses receive appropriate instruction in basic skills, academic advising, and tutoring	65.5%	80.4%
The campus measures and reports on student outcomes from the course, program, and after-graduation accomplishments	58.7%	41.4%
Senior administrators regularly monitor information about progress in increasing retention and graduation rates of students	89.6%	69.3%

Campuses' efforts to assess student progress also appeared to play a role for institutions with higher graduation rates. Nearly 90 percent of the "high-rate" colleges

said that "senior administrators regularly monitor information about progress in increasing retention and graduation rates of students" was descriptive or very descriptive of their institutions, compared to 69.3 percent of the "low-rate" colleges. And about 59 percent of the higher-rate institutions said that measuring student outcomes and post-graduation accomplishments was descriptive or very descriptive of their institutions, compared to about 41 percent of the lower-rated colleges.

These administrative, academic advising, and assessment conditions might be important for describing the reasons for differences in graduation rates for "high-" and "low-rate" institutions. However, these results should be read with caution, since other factors and data that are not collected by the survey instrument—such as student financial aid—also may have affected graduation rates. It is also possible that institutional admissions selectivity criteria may have played a stronger role in influencing graduation rates than the campus administrative and academic conditions.

Conclusions

With support from Sallie Mae, AASCU developed the National Retention Project to engage college and university presidents and chancellors in leading their campuses to improve student retention and graduation rates, especially the rates of racial/ethnic minority students. Among the tools used to promote these objectives were an annual survey, regional retention conferences, national videoconferences, special projects, and publications. Through the NRP activities, AASCU disseminated strategies that college presidents, deans, faculty, and students could use to promote and support student success.

Survey results over the five Project years are less encouraging, however. Six-year graduation rates have increased only slightly during the study period. These results also show that institutions with greater admissions selectivity were more likely to have higher graduation rates than noncompetitive colleges. These findings raise an important question for AASCU colleges that have open admission policies: is the connection between admissions selectivity and student persistence to graduation so strong that institutions with more liberal admissions policies cannot expect to make appreciable gains in student retention?

Of all the survey participants, only eight campuses showed steady improvement in graduation rates over the period. In the aggregate, their rates increased by 10.3 percentage points for both white and racial ethnic/minority students. In the context of overall outcomes, these results are exceptional. They show that it is possible for institutions to increase graduation rates for all students in a relatively short time period. The strategies used by these institutions to achieve these results merit further study.

Another thirty-two institutions showed overall improvement in graduation rates. However, the average graduation rate for these institutions increase by less than two percentage points. Graduation rates for white students at these colleges increased by only 0.8 percentage points while rates for racial/ethnic minority students increased 3.6

percentage points. This suggests that at least some of the strategies employed by these campuses to improve student retention are having a positive effect, particularly as they relate to minority students.

Based on survey results and campuses' reported experiences in addressing issues of student retention over the five years of the Project, it becomes evident that improving students' retention and graduation rates is neither a short-term nor a simple proposition. Improving graduation rates depends on many factors—such as campus leadership, campus climate, administrative stability, and the extent to which each institution's faculty and staff has been able to meet the needs of its students. Any campus wishing to improve its performance in student retention must make a long-term commitment to the endeavor and be prepared to change the campus climate and services to be responsive to its students' needs.

Overall, the National Retention Project has had positive outcomes. It has focused members' attention on issues of student retention. It has made campuses aware of the types and details of student information that will be required under the Student Right-to-Know reporting conventions, with the result that the number of campuses able to provide this information has almost doubled in four years. Finally, it has brought added attention to important research questions about the relationship between campus conditions and student graduation. What strategies have been most effective in promoting student retention to graduation? What conditions have accounted for retaining racial/ethnic minority students successfully on those few predominantly white campuses that did better than others in graduating these students? What conditions prompt declines in student retention? How do changes in institutional governance, organization, or administration affect student persistence and degree attainment? And finally, given the observed relationship between admissions selectivity and student persistence to graduation, how do institutions with more liberal admissions policies make appreciable gains in student retention?

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GIS TECHNOLOGY & GEODEMOGRAPHIC ANALYSIS AT A SMALL LIBERAL ARTS UNIVERSITY: A "HOME-GROWN" APPROACH

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Abstract

Clark University's offices of Institutional Research and Admissions, inspired by a graduate student's thesis, have begun applying geographic information systems (GIS) technology and geodemographic analysis to support freshmen recruitment. However, unlike geodemographic applications to recruitment at other colleges and universities, Clark's GIS and geodemographic system is uniquely 100% home-grown. It has not relied on outside educational consultants or georeferencing vendors, and multiple applications of this system – ranging from freshmen recruitment and retention to alumni giving and capital campaigns – are foreseeable. Following an introductory discussion about the role of geodemographical analysis in business marketing and freshmen recruitment, this paper focuses on Clark University's development of a customized GIS and geodemographic system for profiling admits, enrollees, and recent graduates with respect to Census socioeconomic data at the block group level. Prospect search filtering results for the state of California are presented and extrapolated to highlight cost effectiveness when filtering becomes incorporated into future recruitment cycles .

GIS, Geodemographics, and Business Marketing

Market research using GIS software and highly disaggregated geodemographic data sets is experiencing rapid growth, driven primarily by large marketing companies such as Claritas and CCN who have 1) compiled extensive geodemographic data sets (known as "PRIZM" and "MOSIAC") based on location-specific US Census "block-groups"; 2) applied statistical methodologies to "cluster" similar block-groups; 3) assigned market segment classifications per each distinctive block-group cluster; 4) profited handsomely from licenses sold to the market research community. As competitor companies derive and sell lower-cost geodemographic market segmentation data sets to market researchers, and as market researchers become increasingly proficient with GIS methods and software improvements, the role of geodemographics in business marketing will continue to grow -- locally, regionally, and nationally.

Geodemographic research essentially consists of two parts: 1) the development of geodemographic profiles based on the household location of current or anticipated product users; 2) the targeting of potential customers based explicitly on household location within similar market segments. The literature includes detailed examples of how these steps are applied to support business decisions ranging from the location of chain stores (Verbeek, 1996) to health care management (Birkin, 1996).

GIS, Geodemographics, and Student Recruitment

Philip Cotler's (1975) suggestion that, in order to prosper under rapidly changing marketplace conditions, colleges and universities would need to pursue modern marketing techniques has gained wide acceptance in the arena of student recruitment. As with the broader business marketing world, the past decade has witnessed the emergence and growth of GIS and geodemographic research in college and university administration.

Considered proprietary, such research resides primarily in reports authored by a growing number of educational consulting companies who use geodemographic maps and data sets under license agreements with Claritas and other geodemographic companies. College and University clients include offices of admissions, alumni, and planned giving; all of whom out-source their confidential databases and receive various geodemographic "profiles" which are utilized to help "filter-out" so-called "cold" prospects (see McCoy, 1997) and/or "target" new market areas for additional prospect development.

As can be expected from this highly proprietary context, the literature on GIS and geodemographic applications in college and university administration is sparse. Noteworthy exceptions are found in publications about the GIS and geodemographic initiatives at Prince George's Community College (PGCC; located in Maryland's Prince George County) and The Ohio State University (OSU). At PGCC, the institutional research office has applied statistical clustering methods similar to those used by Claritas to generate a "home-grown" geomarketing system called PG-TRAK^{90} which sorts Prince George's County's 172 census tracks into 15 distinct clusters. These neighborhood lifestyle clusters have been used extensively for market research, prospect recruitment, and academic performance tracking (Boughan and Diehl, 1994).

At OSU, GIS and geodeomgraphic applications to prospect recruitment and enrollment management have benefited from an unusual collaboration involving the geography and admissions programs (see Herries and Marble, 1995; Marble et al, 1994; Marble et al, 1995; Marble and Herries, 1996; Marble et al, 1997). The collaborative effort began with a feasibility report for a class project on the possible uses of GIS technology for recruitment purposes (Marble et al, 1994), and progressed when a Graduate Research Associate was hired to build GIS infrastructure in ArcView®and to analyze the Ohio component of the freshmen class (Herries, 1995) by combining freshmen admissions historical data with 1990 Census data at block group and school district levels. OSU then replicated what many educational consultants have done by purchasing a site agreement from Claritas for PRIZM clusters/lifestyle segments, census data updates, and TIGER/Line® Files. This enabled OSU researchers to generate PRIZM lifestyle profiles of the Ohio component of OSU students and recent graduates, and these profiles have been used to identify "hot", "warm", and "cold" spots for recruitment

activities throughout the State of Ohio based on recruitment efficiencies and the demonstrated propensity of students from particular lifestyles clusters to enroll and/or graduate. Most recently, the research initiative has introduced ways of identifying enrolling students who are more "at risk" than others based on disparities in parental wealth vs. income levels (Marble et al, 1997).

GIS and Geodemographics at Clark University

Interest in GIS and geodemographics had been brewing simultaneously but independently within Clark University's Admissions and Planned Giving Offices. Planned Giving sought geodemographic-based research services to prioritize its 29,000 record alumni/friends database with respect to each prospect's propensity to make major contributions to Clark's capital campaign. As is routine among planned giving offices trying to accomplish such goals, bids were solicited from consultants who specialize in such services and a vendor was selected.

Alternatively, admissions sought a low-cost geodemographic system to support ongoing administrative research on student recruitment and enrollment management. Some inquiries to geodemographic consulting companies had been made, but these were put on hold when a graduate student who sought to incorporate geodemographical analysis into his MA thesis project suggested that he could build an entirely "home-grown" GIS and geodemographic system from currently available software and databases. A project was soon etched out between admissions and the MA-granting department involving the compilation of TIGER/Line® files, Macron USA® Maps and Data Sets, and Admissions data.

Project Objective, Conceptual Approach, and Research Design

The objective of this project is to build and implement a "home-grown" GIS and geodemographic system to provide "strategic" and "tactical" (see Marble and Herries, 1994) support to Clark's office of Admissions, first by profiling Clark students and subsequently by using these profiles to 1) filter-out names from large prospect lists that are purchased on an ongoing bases to build and strengthen Clark's prospect pool; 2) identify "hot" spots for targeted recruitment efforts.

Research conceptualization and design view Clark's annual college enrollment cycle as a "funnel model" (see Marble and Herries, 1994) characterized by large pools of prospective high school students who – in consecutively smaller percentages -- apply, get accepted, enroll, graduate, and become (contributing) alumni.

Database Sources and Software Integration

The project required the integration of data from three primary database sources, all of which were available at Clark University:

1) US Census Bureau TIGER/Line® files (1988 - current), tabulated from the 1995 Census TIGER/Line® (Topologically Integrated Geographic Encoding and Referencing) data base, provide extracts of selected geographic and cartographic information (including street names) for all counties and statistically equivalent entities in the United States. Further conversion of the TIGER/Line® files from tabular data into cartographic data was necessary (discussed below).
2) Maps & Data Professional® database contains a comprehensive set of geodemographically referenced maps (county, zip code, census tract, and census block group boundaries) with Lat./Long., NAD 1983 and Scale = 1:100,000. Also included are corresponding demographic data sets with numerous fields displaying absolute numbers and (as appropriate) median values for each US block group with respect to ethnicity, ancestry, occupation, incomes, home values, etc. (For future projects it will be necessary to convert many of the absolute variables into percentages).
3) Clark University's Admissions and Registration Databases were queried to produce two additional databases. One database was created to develop a geodemographic profile of Clark Students based on the socioeconomic data associated with student home addresses. This database includes student home addresses, zip codes, and ethnicity for 4,229 domestic students, consisting of 588 recent UG graduates (F'95 - S'97), 1,470 registered undergraduates (S'97), 1,712 non-enrolling admitted applicants (for F'97), and 459 F'97 depositors (as of July 1, 1997). For the 2,171 F'97 admits and depositors, the database additionally contained SAT test score, high school rank percentile, scholarship category, merit award, total institutional award, and indicators for whether the student was an alumni relation or athletic recruit. A second database, developed to demonstrate the process of geodemographic filtering, was created from the names and addresses of 3,864 of Californian high school juniors as purchased from the National Research Center for College and University Admissions (NRCCUA), in Spring 1997.

The entire project was carried out on a DELL OptiPlex GXPro® workstation with Windows NT 4.0® operating system. It required integration of the following GIS Software:

1) TSoft Address List Generator® software was used for address list extraction (individual or batch) from Tiger file county data sets. The extraction process resulted in GIS output files of Tiger file county data in IDRISI® vector format.
2) Tsoft Rosetta® software was used to convert the IDRISI® vector format of Tiger data to ArcView® shape format. (Note: Tsoft Rosetta® software is capable of several other GIS format conversions.)
3) ArcView 3.0® was used to integrate the database inputs, locate objects, produce spatial images, and more generally enable users to visualize, explore, query and analyze geographic information spatially. The software enabled the location of Clark students on maps, and the socioeconomic data associated with each located student was then available for subsequent analysis.

4) Arc/Info 3.4.2® -- with customized AML programming written to convert the numerous ArcView® shape files to Arc/Info® coverage files, merge the counties together, then re-convert Arc/Info® coverage files into comprehensive ArcView® shape files -- was used to merge county databases into entire states and geographical regions. Technical limitations related to database merging in ArcView® made necessary the use of Arc/Info® software.

Geocoding Results and Market Segmentation Profiles

The scope of the project (see Figure 1) consists of three major steps. The first and largest step, as described above with respect to software selection and use, is the repetitive, county-by-county extraction and transformation of TIGER/Line® tabular files into ArcView® shape files depicting entire states and regions.

The second step, which must be repeated for each state, is to "geocode" or "georeference" students by street address and zip code onto the transformed ArcView® map. A specialized geocoding function is included in ArcView® for this purpose. As each match is found, geographic coordinates are derived from the matched feature and assigned to the address record. However, for the subset of cases in which matches are not found, the user may achieve additional matched records by: 1) editing (correcting) errors from unmatched address names, and/or; 2) lowering the default georeferencing preferences (but increasing the likelihood of mis-matched address records). Seventy-five percent address match success rates are considered "good" among georeferencing practitioners.

Georeferencing applied to 3,674 (87%) of the entire 4,229 Clark University student and admits database (limited to students from 10 adjacent Northeast feeder states) resulted in an 84% overall address match success rate, with state address matching percentages ranging from 53% and 61% (Vermont and Maine) to 93% and 99% (Connecticut and Rhode Island). Georeferencing results for these ten Northeastern states plus two other important feeder states (California and Florida) are shown in Table 1.

Georeferencing enables the database of recent Clark students and Fall '97 admits to be visually displayed by street address, by parents' household location within census block group polygons, and – most importantly – by various socioeconomic attributes of these block group polygons. (Editorial space constraints forced the omission of an illustrative visual display, hence the geodemographic filter shown in Figure 2 but explained below is introduced presently to serve as a visual substitute.)

The third step illustrated in Figure 1 is to create market segmentation profiles for the (successfully matched) student population from the inferential, block group-level demographic information associated with each student's home address. Beyond offering valuable information, market segmentation profiles provide the necessary quantitative insights for targeting "hot" prospects or filtering-out "cold"

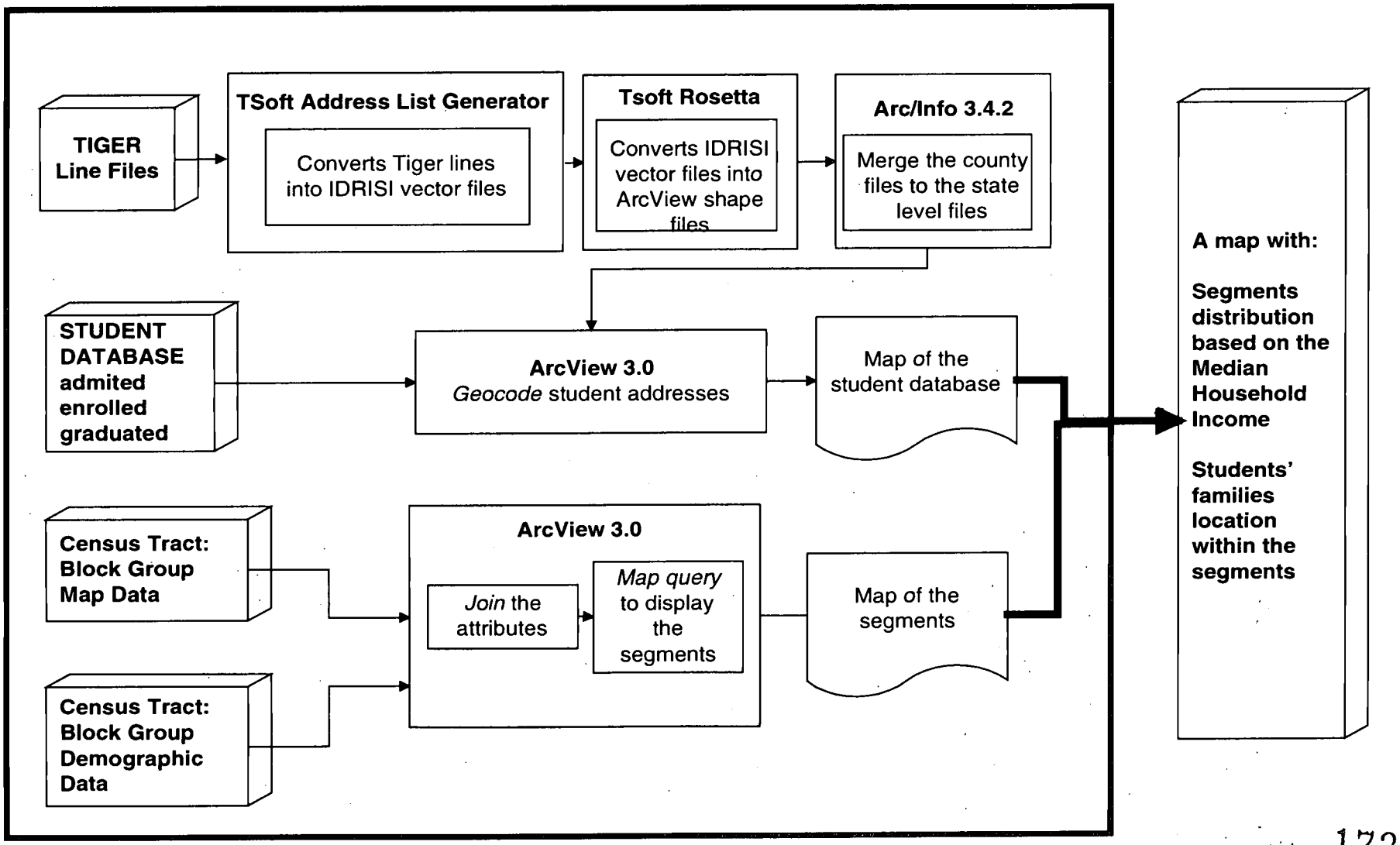

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Figure 1. Flow-chart of the analysis of the Clark's student body

prospects based on the desirability of socioeconomic attributes associated with the block groups within which the parents of students live.

Table 1: Georeferencing results for primary feeder states

	STATE	F'97 Admits	F'97 Deps (7/1)	'95-'97 Enrols	'95-'97 Grads	Total Stdnts	Cum. %	1st Geo-Code	2nd Geo-Code	State-Level Address-Match %
1.	MA	497	172	715	280	1664	39.3%	1326	1375	83%
2.	NY	343	55	213	76	687	55.6%	442	574	84%
3.	CT	170	51	167	70	458	66.4%	347	428	93%
4.	ME	102	29	64	15	210	71.4%	98	139	61%
5.	NJ	106	23	44	17	190	75.9%	153	169	79%
6.	NH	54	30	45	10	139	79.2%	82	119	86%
7.	PA	60	15	26	22	123	82.1%	92	103	84%
8.	RI	26	20	34	16	96	84.3%	77	95	99%
9.	MD	28	9	15	8	60	85.8%	50	53	88%
10.	VT	26	7	11	3	47	86.9%	20	25	53%
Subtotal		**1412**	**411**	**1334**	**517**	**3674**	**86.9%**	**2687**	**3080**	**84%**
11.	CA	99	12	33	18	162	90.7%	114	124	76%
12.	FL	28	9	20	11	68	92.3%	33	42	63%

To facilitate profile creation and analysis for those students whose parents live in the 10 Northeast state region, a smaller subset of the Macon USA® Maps and Data Professional Sets database was extracted to include only those block groups where parent addresses had been successfully georeferenced. Furthermore, all profiles thus far developed from georeferenced Clark University student data have been based exclusively on median block group income level, which is but one of several variables available in Macon USA® Maps and Data Professional Sets. (Market segmentation based on other variables, such as ethnicity and educational attainment by parents, has a preeminent position on a long list of future GIS and geodemographical research and analyses projects.)

Several median income market segmentation distributions, or "signature profiles", have been created for Massachusetts, California, and the 10 state northeast region to view distribution of block groups within which the parents of students live versus the distribution of all block groups comprising Massachusetts, California, and the 10 state northeast region.

Figure 3 displays one such signature profile for the 10 state northeast region. Black bars represent the region-wide percentage distribution of Block Group median household incomes as divided into 12 equal intervals ranging from $0-$12,500 to $137,500-$150,000. White bars represent calculated percentages (per each

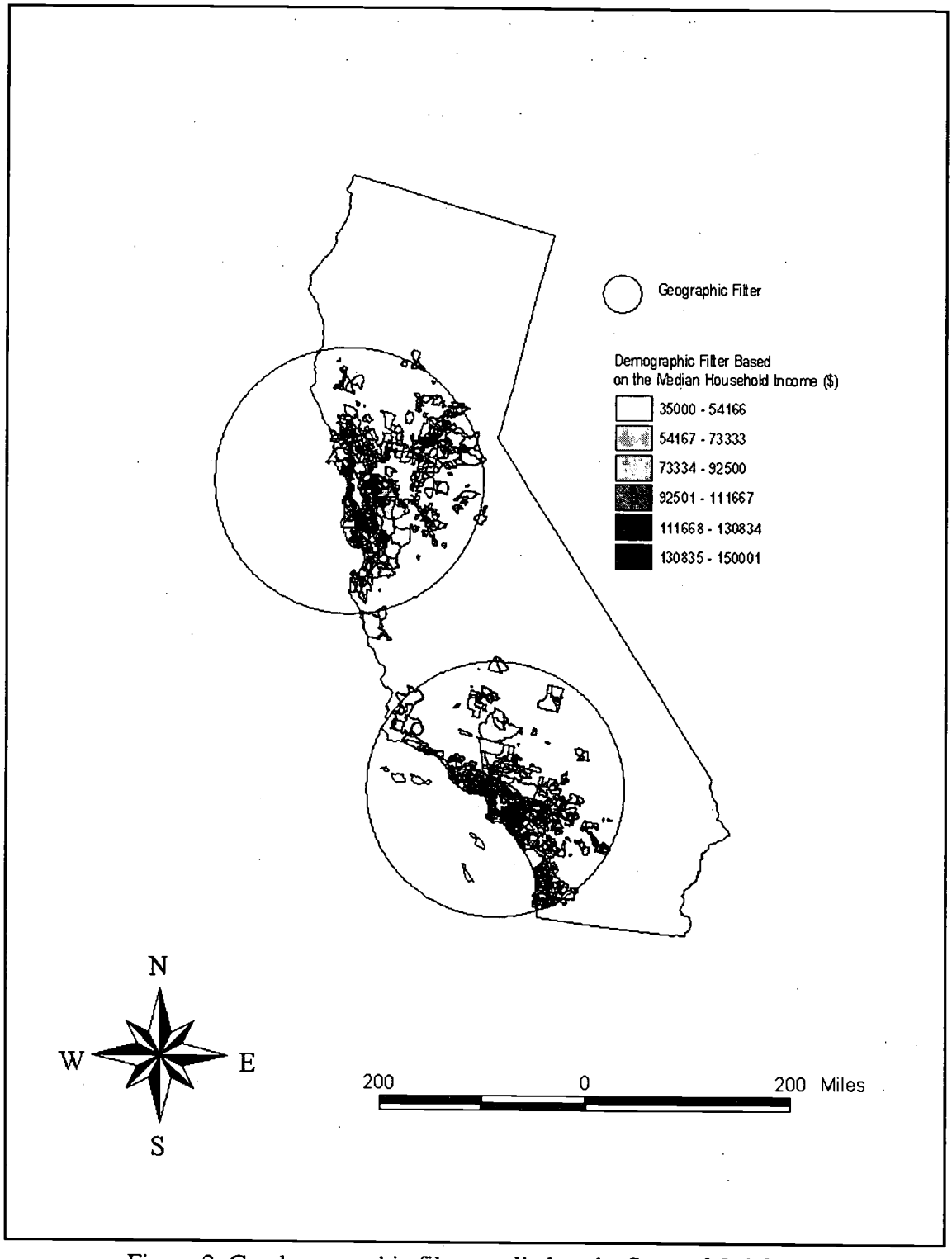

Figure 2. Geodemographic filter applied to the State of California

household income range) of the total number of block groups that include a Clark admit or alumnus. As can be expected in light of Clark's 1997 tuition charge

($20,500), the profile shows that Clark "captures" a relatively large percentage of the small $87,500+ median household income market. But the profile further suggests that Clark's "core" market is located among block groups with median household incomes between $25,000 and $62,5000. Similar signature profiles for Massachusetts and California suggest a pattern whereby out-of-state students generally come from wealthier backgrounds compared to the backgrounds of in-state students.

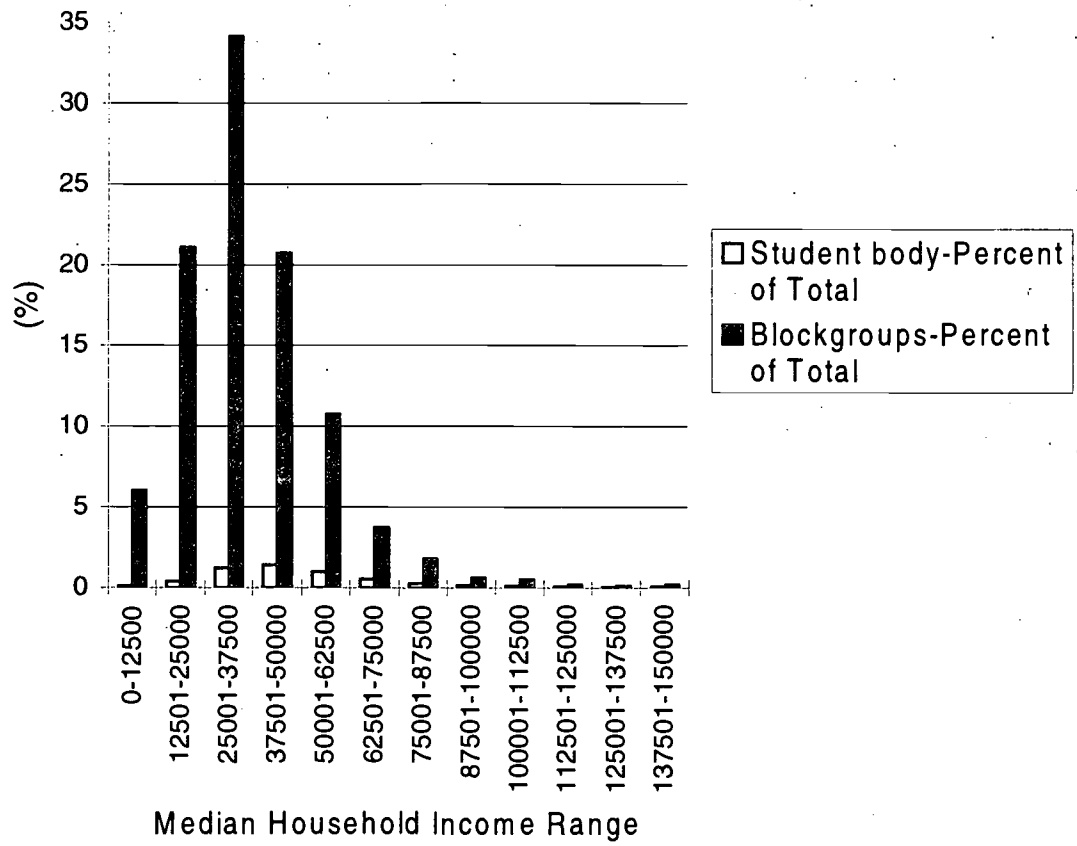

Figure 3. Captured Market In 10 State Northeast Region

Projected Costs and Benefits of Geodemographic Filtering

When the project approached 70% completion – a point in time at which ArcView® shape files for 35 states had been created, student data from Clark's 12 largest feeder states had been geocoded, and profiles had been created for Massachusetts, California, and the 10 northeast states – emphasis switched to provide a concrete application suitable for an MA thesis and of particular interest to Clark's administration.

From these constraints emerged the idea of applying the GIS and geodemographic system -- as geographic and income filters -- to the Californian subset of college bound high school junior names and addresses purchased from NRCCUA (as of

mid August, 711 current F'98 prospective students have been generated from the 3,864 Californian high school juniors who responded favorably to Clark's search mailing), and then extrapolating filtering results to estimate recruitment outcomes (costs and benefits) if the filtering process were to have been applied to the combined list of 210,000 college bound sophomores and juniors purchased in F'96 and S'97 from the NRCCUA and Educational Testing Service (ETS).

Base-line data concerning the prior year (Spring 1996) high school search process, undertaken without geofiltering, includes: 160,000 mailings to all purchased high school juniors; 21,598 return post cards responses indicating interest in Clark (13.5% search conversion), 440 F'97 applications (2% applicant conversion rate), 400 admits, and 82 enrollees. Both search processes contributed proportionally equal amounts to these totals. From an unrecorded number of initial S'96 Californian mailings, Clark received 30 F'97 applicants, 26 admits, and 4 enrollees.

Geographical and income filters were created from spatial and sociodemographic patterns in the Californian Clark admits and recent alumni data set (Figure 2). The geographical filter excluded NRCCUA search prospects located beyond the San Francisco and Los Angelos concentric circles, while the income filter excluded all NRCCUA search prospects associated with low median family incomes (<$35,000). The geocoding and geofiltering process reduced the 3,964 NRCCUA list (including 711 current F'98 prospects) to 1259 (including 209 current F'98 prospects presumably most interested in Clark).

If this 67% filter rate were to have been applied to all 210,000 F'97 search names, the number of initial search mailings could have been reduced to nearly 70,000, but savings (reduced mailings and prospect management) would be generated at the expense of student diversity and revenues associated with an unknown number of students who might eventually have enrolled had they not been geodemographically filtered out. Thus to generate increased revenues and maintain (or increase) student diversity, it makes financial sense for Clark to purchase more search names, and then apply this filtering process to all non-minority names. Based on a series of conservative assumptions concerning the anticipated effect of a 32% filtering ratio (of 400,000 search names) on search prospect conversion rates (to applicants, admits, and enrollees), scenarios have been present to Clark's senior leadership in which geodemographics is forecast to generate an additional 20 F'99 freshmen enrollees and $250,000.

Concluding Remark

A hope kindled, at times bright, that the project would captivate the attention of several key university officials who would create or re-allocate resources to grow the emerging GIS and geodemographic system. Several presentations and interactive displays were offered, and these events were well attended. University-wide support for system was considered but rejected. Future applications of the

GIS and geodemographic system, once finished, will primarily support freshmen recruitment and enrollment management.

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The Undergraduate Classroom Experience: Factors Associated with its Vitality

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ABSTRACT

Since the classroom experience is central to the purpose of educational institutions, we need to examine those factors that exert positive and negative influences upon it. The data in our study contain measures that reflect an array of concepts from the student-institution fit literature, including academic and social integration, student effort and involvement, encouragement of family and friends, financial need and ability to pay, race and campus climate, and goal clarity. The most beneficial classroom experiences are reported by upper division students who perceive a campus climate of racial harmony and tolerance, and who report the highest levels of academic integration in the form of faculty concern for students and the student's own academic effort and involvement.

The Undergraduate Classroom Experience: Factors Associated with its Vitality

The Research and Policy Problem

The undergraduate classroom represents the formal structure in collegiate organizations where learning officially takes place. Nevertheless, the literature on outcomes assessment rarely focuses on the vitality of this experience explicitly. The Pascarella and Terenzini "Moby Book" (1991) presents and discusses the existing array of theories and models of student change, and while several models note the importance of faculty and student interaction, explicit attention to the classroom is either absent or not at all prominent in the discussion. Indeed, most of the empirical studies that provide support for the models by Tinto, by Bean, and by Cabrera and their associates, focus as much on advising and study habits and faculty-student interaction *outside* the classroom, as they do on the dynamics *within* the classroom.

In using these models to examine a variety of desirable student outcomes, Volkwein and his research colleagues in several studies have found that the classroom experience is the single most important influence explaining student growth and satisfaction (Volkwein et al., 1986; Volkwein, 1991; Volkwein & Carbone 1994; Volkwein & Lorang, 1996). Terenzini's NCTLA model (1995) is the first to explicitly identify classroom experiences as having a prominent role in producing learning outcomes. In their recent studies at the NCTLA, Pascarella and Terenzini and their research colleagues have now begun to incorporate measures of course learning, instructor effectiveness, and other academic experiences into their examination of learning outcomes (Terenzini et al., 1995, 1996; Pascarella et al. 1996). At least two of these studies (Terenzini et al., 1995; Pascarella et al. 1996) have found that the CSEQ measures of instructor organization, skill, clarity, and support have exerted heavily significant influences on student outcomes.

Given the importance of the classroom experience, both conceptually and empirically, the purpose of this study is to examine the factors in the undergraduate experience that appear to be the most strongly associated with vitality in the classroom, as reported by students.

Conceptual Theoretical Framework

There are at least three major assertions regarding the nature of adjustment to college. The most traditional view is that academic preparedness for college and clear goals are the main factors accounting for differences in persistence behavior, academic performance, and other educational outcomes (Feldman & Newcomb, 1969). A second group of alternative yet complementary perspectives fall under the general description of

student-institution fit models (Pascarella & Terenzini, 1991). Perhaps the most widely researched of these models claims that student persistence and growth depends on the degree of successful integration into the academic and social structures of the institution (Spady 1970, 1971). Tinto has advanced this model and elaborated on it with the additional claim that successful adjustment to college involves severing ties with family and past communities in order to successfully integrate the student into the new academic community (1987,1994) . Another complementary perspective to the student-institution fit model focuses on the importance of student involvement and effort (Astin 1984, Pace 1984). Others argue that support from friends and family are important enhancements to college adjustment (Bean 1980; Bean and Metzner 1985; Nora 1987; Nora et al. 1990). Yet another branch of this literature emphasizes the importance of financial variables and the student's ability to pay (Cabrera et al. 1990; St. John, 1994).

A third set of assertions rest on the role that perceptions of prejudice and discrimination play in student adjustment. Exposure to a campus climate of prejudice and discrimination has gained increased attention as the main factor accounting for the differences in persistence rates between minorities and non-minorities (e.g. Fleming, 1984; Hurtado, 1992, 1994; Hurtado, Carter & Spuler, 1996; Smedley, Myers & Harrel, 1993). Many authors argue that intolerance towards minority students establishes a climate of racial prejudice and discrimination that permeates both academic and social interactions, and thus figures prominently in explaining their maladjustment with the institution (Hurtado, 1992, 1994; Hurtado, Carter & Spuler, 1996; Loo & Rolison, 1986; Murguía, Padilla, & Pavel, 1991). The resulting low involvement with the different campus communities impinges on the minority student's cognitive and affective development as well as persistence (Fleming, 1984; Loo & Rolison, 1986; Smith, 1989, 1992; Tracey and Sedlacek 1984,1985,1987; Suen, 1983; Loo and Rolison 1986). Not all studies have supported these claims (Arbona and Novy 1991; Nettles, Thoeny and Gosman 1986; Cabrera and Nora 1994), and there is at least preliminary evidence that perceptions of prejudice and racial disharmony affect White and minority students alike (Nora & Cabrera, 1996).

Since the classroom experience is central to the purpose of educational institutions, we need to examine those factors that exert positive and negative influences upon it. The data in our study contain measures that reflect an array of concepts from the student-institution fit literature, including academic and social integration, student effort and involvement, encouragement of family and friends, financial need and ability to pay, race and campus climate, and goal clarity.

Methodology

The study is conducted at a research university with a matriculated undergraduate population of about 10,000 students. The study uses multivariate regression analysis to examine responses to the Spring 1994 undergraduate outcomes survey. This survey is

part of the University's on-going assessment program and is administered every three years. It contains over 180 items of information in four categories:

1. Background information about age, class year, sex, ethnicity, employment, admissions status, type of enrollment, major, financial aid, and residence.

2. Student plans, goals, and reasons for attendance.

3. Levels of Student satisfaction with an array of campus services and facilities, as well as with various aspects of the institution's academic, administrative, and social environments or climates.

4. A variety of cognitive and non-cognitive experiences and outcomes, including classroom experiences, faculty contact, course taking patterns, graduation plans, anticipated loan indebtedness, Grade Point Average (GPA), and self-reported growth.

The regression analysis for this study is conducted on 496 representative undergraduates who responded to the 1994 outcomes survey by completing at least 90% of the survey questions. The 496 are representative with respect to age, gender, and admissions status. Seniors and ethnic minorities were over-sampled to ensure their generous representation in the database, since these are the populations of greatest interest. While not every undergraduate field of study is present in the sample, the 15 largest majors are represented in approximate proportion to their numbers in the undergraduate student body. Table 1 lists the variables that are assembled for the regression model.

Dependent Variable

This research focuses on the classroom experiences reported by respondents to the university's outcomes survey. The dependent variable is a scale of classroom experiences developed by Terenzini and his colleagues (1980, 1982, 1984, 1987) [alpha=.73], and enhanced by Volkwein and his colleagues (1991, 1994, 1996) [alpha=.89]. This is a seven-item scale on which students report the extent to which they have classes in which they are intellectually challenged, learn something new, are given stimulating assignments, etc. [Students respond on a five-point scale: 1=rarely/never, 2=less than half the time, 3=about half the time, 4=more than half the time, 5=almost always.]

Independent Variables

The constructs and variables used in the analysis are shown in Table 1 and are drawn directly from the student-institution fit literature in general, and from the Cabrera and Tinto Models in particular. The specific measures listed in the table for academic integration, social integration, campus climate, encouragement, finances, and goal commitment are borrowed not only from Cabrera's work (1992, 1993), but also from studies by Pascarella and Terenzini, 1982; Terenzini, et al., 1982, 1984; Nora 1987; Nora, et al. 1990; Volkwein, et al., 1986; Volkwein 1991; Volkwein & Carbone, 1994; and

Volkwein & Lorang, 1996. The alpha reliabilities for the various multi-item scales used in these studies are recalculated for this population; and as shown in Table 1, many exceed .80 and all but one are above .70.

Table 1. Descriptive Statistics and Marginal Distributions
(N = 496)

Variables & Multi-item Scales	**Count**	**Cell %**	**Mean**	**S.D.**	**Alpha**
Demographics (dummy vars.)					
Ethnic Minority (non-White)	137	27.6			
Male	298	60.1			
Class Year (dummy vars.)					
Upper Division	345	69.6			
Lower Division	151	30.4			
Academic Integration:					
Faculty Contact (1 item)			3.01	1.30	
Faculty Concern (2 items)			3.38	.88	.74
Involvement/Effort (2 items)			3.68	.98	.76
Social Integration					
Peer Relations (2 items)			4.01	1.01	.87
Goal Commitment					
Goal Clarity (3 items)			3.93	.93	.72
Campus Climate					
Harmony/Tolerance (5 items)			2.81	.66	.67
Perceptions of Prejudice (2 items)			2.72	.97	.89
Encouragement					
Friends (1 item)			3.70	1.23	
Family (1 item)			4.13	1.08	
Economic Factors					
Financial Difficulty (1 item)			2.90	1.32	
Financial Need (3 items)			2.46	1.68	.81
Work Study (dummy var.)	200	40.3			
Classroom Experiences (7 items)			3.69	.70	.86

Results

The results of our analysis are shown in Table 2. The significant beta weights are attached to the variables reflecting faculty concern (.33), racial harmony (.15), student effort (.14), upper division status (.13), goal clarity (.08), and encouragement from friends (.07). The adjusted R-square exceeds .42 which is quite strong for a study measuring a student self-reported behavior. Thus, the most beneficial classroom experiences are reported by upper division students who perceive a campus climate of racial harmony and tolerance, and who report the highest levels of academic integration in the form of faculty concern for students and the student's own academic effort and involvement. Of significant, but secondary importance as influences on the classroom experience are the 3-item scale of goal clarity and the single item reflecting personal support from friends.

The prominent roles of faculty concern and student effort in the classroom experience are consistent with several branches of the student-institution fit literature. Indeed, a favorable classroom experience and faculty respect for students and student effort may all mutually reinforce each other. If so, this situation occurs more frequently in classes attended by juniors and seniors than by freshmen and sophomores.

Given the discussions in the literature, we expected to observe significant influences by the variables reflecting gender, financial need and ability to pay, and race and perceptions of prejudice. However, these variables are not influential with this population. We are not surprised by the non-significance of gender because other studies at this particular university have found few male-female differences. We are surprised, however, that the economic variables do not intrude into the classroom and influence the quality of that experience. Apparently, these students do not take their financial problems into the classroom. The non-significance of race/ethnicity challenges some of the statements in the literature about the permeability of discrimination throughout all aspects of the undergraduate experience. We did not find it. Additionally, racial harmony in our study exerts greater *positive* influences on the classroom environment than perceptions of prejudice exert *negative* ones. This invites closer examination.

Thus, in this study we have explored a number of student variables that the literature suggests might influence the classroom experience. The most beneficial classroom experiences are reported by upper division students who perceive a campus climate of racial harmony, and who report the highest levels of academic integration in the form of faculty concern for students and the student's own academic effort and goal clarity. Such findings are entirely consistent with the mainstream of the student-institution fit literature.

This line of research is important because of the current national interest in the undergraduate experience and the instructional contributions that faculty make. Our dependent variable -- which we believe reflects classroom vitality -- is a scale of items that reflect the presence in the classroom of well-prepared, caring, and interesting

instructors who give meaningful assignments, according to the students. Thus, our classroom scale

Table 2. Regression Analysis Results
(Dependent Variable = Classroom Experiences)

Variables & Scales	Beta	S.E.
Demographics:		
Ethnic Minority (non-White)	-.058	.0587
Male	.028	.0553
Class year:		
Upper Division	.130**	.0629
Academic Integration:		
Faculty Contact (outside class)	.018	.0218
Faculty Concern	.333**	.0308
Involvement/Effort	.139**	.0287
Social Integration		
Peer Relations	-.032	.0263
Goal Commitment:		
Goal Clarity	.079**	.0302
Campus Climate:		
Racial Harmony/Tolerance	.149**	.0424
Perception of Prejudice	-.018	.0281
Encouragement:		
Friends	.067**	.0234
Family	-.001	.0270
Economic Factors:		
Financial Difficulty	.020	.0280
Financial Need	-.009	.0235
Work Study	.010	.0553

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

F^{**} **(15,6.0446)** =22.28; R^2 =.4437; R^2 ***adjusted*** = .4238

emphasizes faculty *behaviors*, rather than faculty *characteristics*. Apparently these faculty behaviors not only stimulate student learning, but also overcome student differences in race, sex, financial need, and family background -- differences that under conditions of good teaching are left at the classroom door.

Future research on this topic should incorporate measures that reflect other aspects of the students and their classroom experiences, including test scores, transfer status, prior achievement, and academic major. In the meantime, additional analyses are planned with this dataset. The possibility of interaction effects cannot be ignored, and we plan to undertake other regressions holding some of our key variables in and out of the analysis. Also, structural equation modeling may reveal additional dynamics among these variables. We also plan to conduct a similar analysis using a multi-campus dataset.

This preliminary research suggests, however, that a holistic assessment of the undergraduate classroom experience is significantly influenced by student perceptions about campus climate, especially those aspects of campus climate reflecting faculty concern for students, racial harmony, and student involvement. This is entirely consistent with a campus agenda that encourages faculty attentiveness, student conscientiousness, and tolerance among all members of the campus community.

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1997 Conference Program

NEAIR 24th Annual Conference Program	
Saturday, November 1	
1:00-5:00 p.m.	**Conference Registration in 3rd Floor Foyer/Lobby**
2:00-5:00 p.m. Nathan Hale South J. Fredericks Volkwein Director of Institutional Research & Associate Professor of Educational Administration and Policy Studies University at Albany	**Managing a Program of Outcomes Assessment, Part 1** This workshop acquaints institutional researchers with the tools and processes for assessing campus and educational outcomes. Participants will review the multiple purposes and uses of assessment, and will learn about various methodologies and instruments that are available and appropriate. Participants should bring copies of assessment plans and reports from their own institutions where possible. Workshop
2:00-5:00 p.m. Nathan Hale North Karen Bauer Assistant Director of Institutional Research and Planning University of Delaware	**Newcomers to Institutional Research: Strategies for Effective Institutional Research, Part 1** This workshop is designed for new practitioners who engage in IR activities. Using the AIR monograph, Strategies for the Practice of Institutional Research, the workshop addresses key components of IR including defining critical issues for institutional research, identifying sources of data, developing factbooks and other reports, and conducting effective survey research for assessment and evaluation. The main focus is a presentation of general concepts and practical strategies for the implementation or continued development of effective IR at many schools, regardless of size or type. Workshop
2:00-5:00 p.m. Ethan Allen South April L. Dobbs Assistant Director, Institutional Research and Planning Shippensburg University	**Investigating Institutional Concerns Through Exploratory Data Analysis** This workshop shows participants how to investigate institutional concerns using exploratory data analysis. Topics covered include the difference between exploratory and confirmatory data analysis, ways to "look at" data through graphs and correlation matrices, and hypothesis generation. Participants should already have a Conceptual understanding of descriptive statistics, correlations, and hypothesis testing. Workshop

NEAIR 24th Annual Conference Program	
Saturday, November 1 continued	
2:00-5:00 p.m. Ethan Allen North Kathleen Keenan Director, Institutional Research Massachusetts College of Art	**Graphic Design Basics for the IR Office** Most institutional research findings are still communicated by the printed page. Software and laser printers have increased our ability to produce attractive documents, but they cannot make design decisions for us. This workshop introduces the design process and basic design principles. Topics covered include page and document formats; designing with type; charts, tables and graphics; and related printing and production issues. Participants are invited to bring examples of documents to share. While a computer demonstration may be included, this workshop focuses on principles and strategies, not on specific software mechanics. Workshop
6:00 p.m.	**Early Bird's Reception in Connecticut Ballroom**
Sunday November 2	
8:00 a.m.-5:00 p.m.	**Conference registration continues in 3rd Floor Foyer/Lobby**
9:00 a.m.-noon Nathan Hale South J. Fredericks Volkwein University at Albany	**Managing a Program of Outcomes Assessment, Part 2** Continuation; Part 1 is a pre-requisite. Workshop
9:00 a.m.-noon Nathan Hale North Karen Bauer University of Delaware	**Newcomers to Institutional Research, Part 2** Continuation; Part 1 is a pre-requisite. Workshop
9:00 a.m.-noon Ethan Allen North Mary Ann Coughlin Professor of Research & Statistics Springfield College	**Statistics for Institutional Research, Part 1** In Part 1 the very basic ideas in statistics will be covered in a way useful as an introduction or as a refresher to statistics. Descriptive statistics, sampling and probability theory as well as the inferential methods of chi square, t-test and Pearson's r will be covered. May be taken with or without the follow-up advanced workshop. Workshop
9:00 a.m.-noon Ethan Allen South Robert K. Toutkoushian Executive Director, Office of Policy Analysis University System of New Hampshire	**Conducting Faculty Salary Studies, Part 1** This workshop will explore how institutional research offices can examine issues relating to faculty compensation, such as gender equity. Topics will include: review of statistical concepts and methods, regression model specification, reading computer output, presenting results from analyses, and current topics in faculty compensation. Workshop

NEAIR 24th Annual Conference Program	
Sunday, November 2 continued	
Noon-1:00 p.m.	**Buffet lunch for Sunday workshop participants. Tickets required.**
1:00-4:00 p.m. Ethan Allen North Mary Ann Coughlin Springfield College	**Intermediate Statistics Workshop** This workshop will review two commonly used statistical procedures: Analysis of Variance and Regression Analysis. The workshop will be broken into two modules: Analysis of Variance: Will review basic research designs that would be appropriate for these analyses. Will focus on univariate ANOVA's. Regression Analysis: Will review the basic principles and theories behind regression analysis. The basic concepts of prediction will be reviewed and the session will cover bivariate, multiple, and logistic regression. Workshop
1:00-4:00 p.m. Ethan Allen South Robert K. Toutkoushian University System of New Hampshire	**Conducting Faculty Salary Studies, Part 2** Continuation; Part 1 is a pre-requisite. Workshop
1:00-4:00 p.m. Nathan Hale North Jim Ferguson Director of Institutional Research Bates College	**Web Basics for Institutional Researchers** This workshop will be an introduction to the basics of "finding resources on the web" and "putting information on the web" for institutional researchers. It is intended to give relative beginners some of the practical and technical background needed to locate institutional research information on the web and to set up a basic web site. Workshop
1:00-4:00 p.m. Nathan Hale South Anne Marie Delaney Director of Institutional Research Babson College	**Research Design Ideas for Institutional Researchers** The goal of this workshop is to enhance institutional researchers' ability to translate data into information and to transform reporting into research. Objectives include enabling participants to prepare methodologically sound research reports for their institutions and research proposals for professional conferences. The workshop will demonstrate how the institutional researcher can use principles of research design and selected research techniques to transform data collection activities into meaningful research projects. Ideas for the workshop will be based on research projects completed by the presenter as well as on actual or proposed studies of interest to the participants. Workshop

NEAIR 24th Annual Conference Program	
Sunday, November 2 continued	
1:00-4:00 P.M. Mark Twain Michael F. Middaugh Assistant Vice President for Institutional Research and Planning University of Delaware and Director, National Study of Instructional Costs & Productivity Nancy Ludwig, Northeastern Univ. Denise Krallman, Miami Univ.	**National Study of Instructional Costs and Productivity** The National Study of Instructional Costs and Productivity, sometimes referred to as "The Delaware Study", is increasingly becoming the national standard for benchmarks in the area of teaching workloads. This workshop is directed at institutions contemplating participation in the Delaware Study, as well as those who already participate and seek strategies for enhanced presentation and use of the data. Through a carefully prepared volume of instructional materials that will be provided to each participant, each person at the conclusion of the workshop will be able to: submit data to the Delaware Study for appropriate disciplines at his/her institution; easily interpret and use the summary reports annually provided from the Study; prepare a series of Excel and PowerPoint presentations that effectively communicate the institution's own data as well as comparative benchmarks from the Delaware Study. Workshop
1:00-4:00 p.m. Noah Webster Catherine McKenna Asst VP, Planning/Technical Services Holy Family College	**Catholic Colleges and Universities** Representatives of Catholic colleges and universities are invited to share experiences and common concerns and to plan activities of mutual benefit. Special Interest Group
4:45-6:15 p.m. Ballroom East Moderator: Michael F. Middaugh Assistant Vice President for Institutional Research and Planning University of Delaware	**"What does Accountability in Higher Education Mean to You?"** **Panel discussion with the following participants:** **Dr. Merle W. Harris, President, Charter Oak State College** **Dr. Andrew G. De Rocco, Commissioner of Higher Education** **The Honorable William R. Dyson, State Representative** **Mr. John A. Doyle, Member of the Connecticut State Board of Trustees** Opening Plenary Session
6:15-7:15 p.m.	**President's Reception in 3rd Floor Foyer/Lobby** Sponsored by Peterson's
6:15-6:45 p.m.	Mentor's Meeting in Mark Twain
7:15-9:00 p.m.	**Banquet and Entertainment in Ballroom Center**

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NEAIR 24th Annual Conference Program	
Monday, November 3	
7:45-8:45 a.m.	**Breakfast; Concurrent Special Interest Groups** Sponsored by Scanning Products
8:00-8:45 a.m. Carol Wood Assistant Dean NYS College of Ceramics Alfred University	**SUNY AIRPO** Mark Twain Special Interest Group
8:00-8:45 a.m. Indira Govindan Director, Institutional Research Drew University	**New Jersey Association for Institutional Research** Noah Webster Special Interest Group
8:00-8:45 a.m. Jim Trainer, Director HEDS Consortium	**Higher Education Data-Sharing Consortium** Nathan Hale Special Interest Group
8:00-8:45 a.m.	**2-Year Colleges** Ethan Allen South Special Interest Group
8:00 a.m.-noon	**Conference registration continues in 3rd Floor Foyer/Lobby**
9:00-9:45 a.m. Ethan Allen North Barbara Nangle Graduate Assistant Office of Institutional Research University of Connecticut	**Trends in Student Characteristics and Attitudes by Gender** This session is for exploring the differences in student characteristics and attitudes by gender using both current and historical data. Examples of results are from the CIRP (UCLA's Cooperative Institutional Research Program) survey of first-time full-time freshmen at a state university. Workshare
9:00-9:45 a.m. Mark Twain Michael F. Middaugh Assistant Vice President for Institutional Research and Planning University of Delaware	**Estimating the Relative Contribution and Importance of Variables Which Drive the Direct Cost of Instruction at Colleges and Universities** Data from the 1996 National Study of Instructional Costs and Productivity are fully described in this paper, and provide detailed answers to the question, "Who is teaching what to whom, and at what cost?" The paper describes the results at the academic discipline level of analysis. Moreover, the paper extends the data into a regression analysis that enables institutions to predict the direct costs to be incurred by implementing new academic Programs at their institutions. Research Paper

NEAIR 24th Annual Conference Program	
Monday, November 3 continued	
9:00-9:45 a.m. Nathan Hale Wayne Peterson Director, Institutional Research Lee Mortimer Assistant Director Wright State University	**Using Multimedia as a Tool for the Presentation of Institutional Research** See animated pie charts and line graphs created before your very eyes. Add color photos to otherwise ordinary bullet charts. This session will be a demonstration of a new and exciting tool extremely applicable to the presentation of institutional research data. The multimedia software package "Astound 2.0" will be used to demonstrate the effectiveness of this new technology. Workshare
9:00-9:45 a.m. Ethan Allen South Robert Larsson Consultant, Higher Education	**Variation in Unit Costs in One State University System** The speaker will use data from official annual reports in one large state university system to present color charts exhibiting the significant variation in actual unit costs per student credit hour between majors and between similar institutions, over a five-year period. He will question the implications of uniform tuition policies. Research Paper
9:00-9:45 a.m. Noah Webster William S. Stuart Research Assistant, Planning & IR Eastern Connecticut State Univ.	**Predictor of Early College Academic Performance: Does Race Matter?** This paper asks whether socioeconomic status explains the difference between the college academic performance of white and black students. Research Paper
9:45-10:15 a.m.	**Break in 3rd Floor Lobby - Sponsored by Scanning Products**
10:15-11:00 a.m. Mark Twain Kenneth Ostberg National Student Loan Clearinghouse	**Transfer Track** Presentation of the new service TransferTrack offered by the National Student Loan Clearinghouse beginning fall 1997. Workshare

NEAIR 24th Annual Conference Program	
Monday, November 3 continued	
10:15-11:00 a.m. Ethan Allen North John Pryor Coordinator of Evaluation & Research Office of the Dean of the College Dartmouth College	**Assessing Risk: The Dartmouth College Student Risk Behavior Survey** The Dartmouth College Student Risk Behavior Survey allows researchers to examine behaviors, attitudes, and beliefs about various risky behaviors such as alcohol use, eating disorders, and suicide. Correlates of behaviors can be connected to academic performance and institutional involvement. A Risk Profile can be developed using this instrument, which can be machine-scored or used on the World Wide Web. Research Paper
10:15-11:00 a.m. Ethan Allen South Craig S. Billie Associate for Institutional Research SUNY - Central Administration Linda M. LeFauve Director, Institutional Research Middlebury College	**A Sampling of Survey Techniques, from Design through Assessment** The State University of New York has conducted a system-wide student opinion survey every three years since 1985. Using this as a backdrop, the authors will develop the principles of survey design and implementation. Particular emphasis will be placed on design considerations and objectives at the front end, and the assessment of whether these objectives have been met at the end of the process. Research Paper
10:15-11:00 a.m. Nathan Hale Aghajan Mohammadi Director, Institutional Planning, Research and Assessment Capital Comm Technical College Asnuntuck Comm Technical College	**Retention, Attrition, and Graduation at an Urban Public 2-Year College: A Longitudinal Research on First Time Students** This study was designed to describe the retention, attrition and graduation pattern of the first-time students over a period of five academic years, and to explore the relationship of the students' demographic/academic variables as predictors of retention and graduation in a two-year public urban community college. The purpose was to use the longitudinal data on students and to determine if this information can help identify students who are more likely to drop out or graduate from a curriculum. The data were analyzed using the Exploratory Data Analysis and the Logistic Regression procedures. The results of the study will be used at the institutional level in developing the intervention strategies for retention and graduation. The information also, will be used as the baseline data to explore relevant policy issues regarding the development of the indicators of effectiveness for the State Community College System. Research Paper

NEAIR 24th Annual Conference Program	
Monday, November 3 continued	
11:05-11:50 a.m. Mark Twain Craig Clagett Director, IR and Analysis Prince George's Comm College	**The 1997 Membership Survey and NEAIR's Future** The NEAIR membership was surveyed in spring 1997 to assess member support for, and evaluation of, 12 association goals. Additional questions covered conference attendance, publishing conference proceedings on the Web, reasons for joining NEAIR, and suggestions for new NEAIR activities. Join the incoming NEAIR president to discuss the survey and the future of you association. Workshare
11:05-11:50 a.m. Noah Webster J. Hughes Analyst, Office of Institutional Research University of Connecticut	**Faculty Evaluations at the University of Connecticut, 1993-1996: Small Student Biases Present, but Not Important** This paper uses 140,000 evaluations from the University of Connecticut, 1993 - 1996, to test the correlates of student ratings. All are significant, especially "expected grade", but only 9% of the variance is explained. These findings indicate that student ratings of faculty is one valid and legitimate measure, among others, in assessing faculty quality. Research Paper
11:05-11:50 a.m. Nathan Hale Hui-May Chu Research Analyst Office of Institutional Research University of Connecticut	**Automation by Excel** How to customize reports by Excel Automation. Techniques will be shared that reduce duplication of data storage, formatting and increase efficiency in production of tables and graphs from a set of templates. Both simple examples and complicated setups will be illustrated. Workshare
11:05-11:50 a.m. Ethan Allen South Jeff Himmelberger Robert Sandev Clark University Research Paper	**GIS Technology, Geodemographics at a Small Liberal Arts University: A 'Home-Grown' Approach** Clark University's offices of Institutional Research and Admissions, inspired by a graduate student's thesis, have begun applying geographic information systems (GIS) technology and geo-demographic analysis to support freshmen recruitment. However, unlike geodemographic applications to recruitment at other colleges and universities, Clark's GIS and geodemographic system is uniquely 100% home-grown. It has not relied on outside educational consultants or georeferencing vendors, and multiple applications of this system -- ranging from freshmen recruitment and retention to alumni giving and capital campaigns -- are foreseeable. Following an introductory discussion about the role of geodemographical analysis in business marketing and freshmen recruitment, this paper focuses on Clark's development of a customized GIS and geodemographic system for profiling admits, enrollees and recent graduates with respect to Census socioeconomic data at the block group level. Prospect search filtering is also presented.

NEAIR 24th Annual Conference Program	
Monday, November 3 continued	
11:05-11:50 a.m. Ethan Allen North Heather Kim Director, Institutional Research Sacred Heart University	**A Study of Attrition and Persistence Behaviors at A Private Catholic Institution in New England** Based on Tinto's model of attrition in higher education, this study was conducted to learn about characteristics of leavers and persisters and to examine factors associated with attrition and persistence behaviors. Employing logistic regression, this study found that student academic, socioeconomic, and demographic characteristics were related to attrition and persistence behaviors. Research Paper
Noon-1:15 p.m.	**Business Luncheon in Ballroom West**
1:30-2:15 p.m. Ethan Allen North Ivan Gonzalez Senior Analyst Sunny Schlichter Department Administrator Office of Planning & Institutional Rsearch Columbia University	**Innovative Survey Techniques to Lower Costs and Boost Response Rates** This workshare will highlight some of the author's experiences with different methods to survey undergraduates. They will present the key elements of three different survey administrative techniques that have been used: Web-based surveys, "Census-taker" surveys, and "Eating events". The presentation will attempt to relate specific elements of each technique with outcomes of high or low response rates. For each method, the authors will encourage informal discussion of the costs and benefits associated. From the workshare, the authors expect to develop ideas on techniques to lower costs and increase response rates and to share and get feedback on the experience of surveying through the Web. Workshare
1:30-2:15 p.m. Ethan Allen South Rhonda Gabovitch Director, Institutional Research Jennifer Luddy Research Assistant Massasoit Community College	**Remedial Student Outcomes at Massasoit Community College** Our study on 98 remedial students will compare student outcomes of first time freshmen taking all three developmental courses with first time freshmen who are taking no developmental courses. Student outcomes will be defined by enrollment status and GPA. Students in this cohort study attended Massasoit in the Fall of 1995. Worshare
1:30-2:15 p.m. Noah Webster Joyce A. Scott, Vice President for Academic & International Programs Kenneth E. Redd Research Associate American Association of State Colleges and Universities (AASCU)	**Graduation Rates at State Colleges & Universities: Results from the AASCU/Sallie Mae National Retention Project** Since 1991, AASCU has sponsored a National Retention Project for its members. Under the NRP, member colleges are surveyed annually and asked to report their six-year graduation rates for FT full year degree seeking freshmen. The survey also asks colleges to rate their campus' views on administrative, academic advising, and assessment conditions that might affect these graduation rates. This paper describes the NRP project and provides trend data on graduation rates of survey respondents from 1993 - 1996. Research Paper

NEAIR 24th Annual Conference Program	
Monday, November 3 continued	
1:30-2:15 p.m. Mark Twain Mindy Ellis Research Associate Jim Trainer Director HEDS Consortium	**Managing Resistance in the Organizational Change Process** Data from 31 participants in the 1995-96 HERI Faculty Study help identify reasons why some faculty react adversely to institutional change. Findings will be viewed through a quadrant analysis and discussed in the context of motivation and organizational change theories. Suggestions for overcoming concerns about change will be provided. Research Paper
1:30-2:15 p.m. Nathan Hale Karen W. Bauer Assistant Director Institutional Research and Planning University of Delaware	**The UD Longitudinal Study: A Descriptive Look at Freshman to Senior Year Changes** This paper presents findings from the University of Delaware Longitudinal Study. A total of 270 students completed a Fall 1993 *New Student Survey* and a *Spring Student Survey* during each spring term, 1994-1997. Findings presented emphasize changes in academic and personal/social attitudes and experiences, and can provide useful information to institutional researchers who are charged with student assessment, enrollment management, and other strategic planning decisions. Research Paper
2:20-3:05 p.m. Ethan Allen North Rena Cheskis-Gold Office of Institutional Research Yale University	**A Survey of the Surveyors: How Are We Doing on Survey Response Rates?** Campus culture, budget and past experiences influence how we design our student survey methodologies. Data from 10 schools are used to assess what has worked and what hasn't. Please bring anecdotes and examples of your most creative, most successful, and most unsuccessful survey techniques. Workshare
2:20-3:05 p.m. Nathan Hale J. Fredericks Volkwein Alberto F. Cabrera University at Albany	**Factors Associated With The Vitality of the Classroom Experience** This research examines those factors that exert positive and negative influences on the vitality of the undergraduate classroom experience. The study contains measures reflecting an array of concepts from the student-institution fit literature finds that the most beneficial classroom experiences are reported by upper division students who report the highest levels of academic integration and who perceive a campus climate of racial harmony and tolerance. Research Paper

NEAIR 24th Annual Conference Program	
Monday, November 3 continued	
2:20-3:05 p.m. Noah Webster Valerie Rogers Administrative Assistant Pam Roelfs Director, Institutional Research University of Connecticut	**Institutional Peer Comparisons: "Exploring the Peer Database** Using Microsoft Access the University of Connecticut IR office has developed a relational peer database to compare student, faculty, financial aid, academic programs and other characteristics on identified institutions. Informal presentation will cover how to use MS Access to create a peer database system of your own. Workshare
2:20-3:05 p.m. Mark Twain Karl Boughn Supervisor of Institutional Research Office of Research & Analysis Prince George's Comm College	**New Approaches to the Analysis of Academic Outcomes** Using two advanced structural modeling methodologies - path analysis and cluster analysis - parallel models of the academic programs at Prince George's Community College were developed, supported by data tracking the Fall 1990 entering cohort over a period of six years. Path analysis revealed the centrality of student attitude factors (motivation, flexibility, academic gamesmanship) to study career success compared with the lesser impacts of social background, college preparedness, and various process variables. Cluster analysis identified several varieties of success-prone students, as well as three different student sub-bodies, each highly problematic for distinctive reasons. Research Paper
2:20-3:05 p.m. Ethan Allen South John Biter Director, Institutional Research St. Bonaventure University Linda Winkler Director, IR and Planning Mount St. Mary's College	**Issues of Faculty Accountability in Budgets** Accountability for colleges that are highly tuition dependent has been an elusive concept especially in operational times. A college budget is an operational definition of that institution's priorities, but the way administrators reduce or allocate and reallocate budgets is not often made explicit. The model proposed in this paper describes a process that identifies a major source of revenue - faculty - and how income generated from this source is allocated to various budget units of the college. This model allows for a different focus on the allocation of resources that can be more meaningfully tied into the mission of the college thereby increasing accountability. Research Paper
3:05-3:35 p.m.	**Break in 3rd Floor Lobby - Sponsored by ABT**
3:35-4:20 p.m. Mark Twain Robert K. Toutkoushian Executive Director Office of Policy Analysis University System of New Hampshire	**What is the 'Best Size' for a University?** This study uses data from the 1994-95 IPEDS surveys to examine the cost structure of higher education institutions in the United States. The goal of the study is to identify how institutional characteristics, such as enrollment levels, student-faculty ratios, and research intensity, affect higher education expenditures. The results will have direct implications on how to use per-student expenditures as a performance indicator for institutions. Research Paper

Monday, November 3 continued

3:35-5:05 p.m. Nathan Hale Panel Participants: Barbara R. Sadowski, Asst to Pres. Joan McDonald, Asst Dir, OIR Marywood University Anne Marie Stamford Research Associate, OIR University of Scranton Scott Bodfish Director of Institutional Research Wilkes University	**Choosing Benchmarks and Key Indicators to Measure Strategic Goals** Measures of institutional quality, effectiveness and efficiency are collected and used for inter-institutional comparisons by external publications and agencies such as *Money* and *USNWR*. Although some of these "objective" measures can be useful internally for documenting progress towards strategic goals, recent accounting changes create problems in comparing measures such as educational costs per FTE. The panel discussion will cover key indicators for faculty, students, staff and financial performance. Handouts from Moody's, Standard and Poors and KPMG peat Marwick will be provided along with a bibliography. **Panel**
3:35-4:20 p.m. Ethan Allen North Bruce Szelest Associate for Institutional Research University at Albany	**Strategic Enrollment Management and Policy Planning: A System Dynamics Approach** A strategic enrollment management causal model is developed within a system dynamics framework. Feedback relationships between organizational structures and policies are examined with respect to student admissions, enrollment, and attrition/retention. The system dynamics methodology is used as a means of encouraging decision-makers to think strategically about the factors that affect student enrollment. Research Paper
3:35-4:20 p.m. Noah Webster Cherry Danielson Research Associate Office of Research for Student Affairs University of Michigan	**Research and Assessment Functions: Where Are They in the Organizational Structure** This workshare has two purposes: First, to identify if and where, in the organizational structure, a broad range of assessment and research functions are being accomplished at peer institutions; and secondly, to compare the pros and cons of the effectiveness of these functions based on organizational positioning. Workshare
3:35-4:20 p.m. Ethan Allen South Robert J. Ploutz-Snyder Institutional Research Analyst Office of Analysis and Planning New York Chiropractic College	**Using Structural Equation Modeling (SEM) to Validate Internally Created Survey Instruments** Structural Equation Modeling is a technique that can be used in place of/in addition to more traditional analyses. It tests the fit of pre-defined models that describe relationships among variables. Results of a confirmatory factor analysis using SEM are presented and the pros and cons of the technique are discussed. Research Paper

Monday, November 3 continued

4:25-5:10 p.m. Ethan Allen South Mary-Louise Gerek Institutional Research Analyst Office of Institutional Research Nazareth College	**Project and Time Tracking in a Request Oriented Environment** Maintaining a simple time tracking system in Excel can provide IR managers with the tools to document project time within the office, help set work priorities, and track customer utilization of office resources. Project request sheets, a project log and a time log are applicable in a one-person operation or an office with a multiple person staff. Workshare
4:25-5:10 p.m. Ethan Allen North Michael McGuire, Director Office of Institutional Research Georgetown University	**Anarchy in the UK? The Continuing Evolution of Higher and Further Education in the 1990s** Post-secondary education in the United Kingdom has undergone a significant metamorphosis in the 1990s, and the changes are not over yet. This presentation will include a summary of the framework for higher and further education in the U.K.; the focus and outcomes of a systematic study that was completed this year; and perceived similarities and differences in both the structure of and current debates within the higher education communities of the United Kingdom and the United States. Research Paper
4:25-5:10 p.m. Noah Webster Sherri Noxel Graduate Administrative Associate Beth Venter Asst to the University Registrar The Ohio State University	**Three Research Approaches to Determine Why Four Years is Not Enough Time for Students** Analysis of recent baccalaureate cohorts and individual student CIRP data and alumni interviews identified enrollment patterns and the student experiences that impact time to degree. The discussion will focus on the methods and major findings of these three projects that comprise The Ohio State University's comprehensive review of undergraduate process. Workshare
4:25-5:10 p.m. Mark Twain Lydia Snover Assistant Director of Planning Information MIT Planning Office	**AIR Technology Taskforce** Created by AIR in Spring 1997, the taskforce is charged with examining the prevailing issues of information practices and technology, particularly as they have an impact on the work, offices and institutions of the members of AIR. As part of the process of documenting the impact of technology on Institutional Research and understanding the needs of institutional researchers for training and professional development, the task force is asking members of the IR community to discuss these issues with them. This session will provide an opportunity for members of NEAIR to help the Technology Taskforce understand the technology issues which are important to them. Workshare

NEAIR 24th Annual Conference Program	
Tuesday, November 4	
7:30-9:00 a.m. Ballroom West	**Breakfast; Concurrent Table Topics and Special Interest Grps**
8:00-8:50 a.m. Ellen Armstrong Kanarek Vice President Applied Educational Research, Inc.	**ASQ and ASQ+ Applied Educational Research** Table 1 An opportunity for those interested in the Admitted Student Questionnaire, or Admitted Student Questionnaire Plus, to discuss their experiences, have their questions answered, get help on specific analyses for your ASQ/ASQ+ data, and learn what changes may be planned. Special Interest Group
8:00-8:50 a.m. Gary Gruberth Research Analyst Martha Gray, Director Institutional Research Ithaca College	**Why Pay For Data Entry Programs?** Table 2 Free downloadable microcomputer program (Epi info) from the Center for Disease Control is available which allows users to define data entry screens. Facilitates comprehensive data entry with error checking. Data can be saved in many formats for use in various statistical packages. Table Topic
8:00-8:50 a.m. Alan McArdle, Associate Director Ken Moore, Project Manager University of Massachusetts Amherst	Developing a Data Warehouse Table 3 This is an opportunity to discuss some of the problems and solutions people have found in developing data warehouses in an academic setting. We will use our own experiences in trying to organize 8 years of student, enrollment and faculty data into a consistent framework as a focal point. We are also interested in forming a network of higher education people in the Northeast who are involved with designing, developing or using data warehouses.
8:00-8:50 a.m. Linda Gardner Administrative Services Specialist University of Connecticut	**Internet Surveys** Table 4 This discussion will be geared to brainstorming the different approaches that could be used when using internet to administer a survey to college students, faculty or staff. The discussion will be from how to get started, to voicing pros and cons to this method and foreseen and unforeseen problems and possible ways to resolve them.
8:00-8:50 a.m. Helen T. Schneider Director, Research & Analysis Maryland Independent Colleges and Universities Association	**Focus Group 1: The Philadelphia Conference** Table 5 A focus group to elicit information on the strengths and weaknesses of this year's conference, led by the program chair of next year's conference. By invitation. Table Topic

NEAIR 24th Annual Conference Program	
Tuesday, November 4 continued	
8:00-8:50 a.m. Steven W. Thorpe Director, Institutional Research La Salle University	**Focus Group 2: The Philadelphia Conference** Table 6 A focus group to elicit information on the strengths and weaknesses of this year's conference, led by the local arrangement's chair for next year's conference. By invitation. Table Topic
8:00-8:50 a.m.	**Outcomes Assessment - Previous Workshop Attendees** Table 7 A time set aside for the participants of previous Outcomes Assessment workshops to meet and discuss what they are doing. Table Topic
9:00-9:45 a.m. Ethan Allen North Anne Marie Delaney Director of Institutional Research Babson College	**Parental Income and Students' College Choice Process: Research Findings to Guide Recruitment Strategies** The primary purpose of this paper is to present the methodology and results from a study designed to identify factors related to the college choice process of higher and lower income students. Based on analyses of responses to the fall 1996 admitted student questionnaire, the study is intended to guide future recruitment processes for students eligible for financial aid and for students whose families are able to assume the full financial responsibility for their college education. Research Paper
9:00-9:45 a.m. Ethan Allen South Peggeye Cohen Asst VP for Institutional Research George Washington University	**Banner and IR** An opportunity for Banner users to discuss common issues regarding IPEDS, generating reports and implementing 2.1.5. Participants are asked to share procedures and processes that utilize the Banner system optimally. Workshare
9:00-9:45 a.m. Nathan Hale Karen DeMonte Institutional Research Analyst Dale Trusheim Associate Director Institutional Research & Planning University of Delaware	**Developing an Expanded Student Tracking System** This study describes how one institution developed an expanded student tracking system to report enrollment information beyond retention and graduation rates. This additional information is critical for academic assessment needs and institutional self-study. We discuss the development of the database and provide examples of the expanded reporting capabilities the database allows. Workshare

NEAIR 24th Annual Conference Program	
Tuesday, November 4 continued	
9:00-9:45 a.m. Noah Webster Robert K. Toutkoushian Executive Director Office of Policy Analysis University of System of New Hampshire	**The NRC Graduate Program Ratings: What are They Measuring** In this paper, we analyze the graduate program ratings derived from the 1993 National Research Council (NRC) survey. We show that the ratings are influenced by a series of faculty, institutional, and student characteristics. We also compare and contrast program ratings for scholarly quality and program effectiveness. Research paper **Recipient of the "Best Paper" award at the Princeton Conference, 1996.**
9:00-9:45 a.m. Mark Twain Denise A. Krallman Institutional Research Analyst Miami University	**First-Year Student Expectations - Pre and Post Orientation** Every year college freshmen enter institutions of higher education with a set of preconceived ideas and expectations. In some cases, these expectations are unrealistic and can result in a student facing academic or social failure and withdrawal from the institution. For this study, students' academic, personal and social expectations were assessed using PEEK prior to summer orientation and then again prior to the start of the fall semester. Results indicate that intervention during orientation is successful in changing students' expectations in all three areas. Research Paper
9:45-10:30 a.m.	**Break in 3rd Floor Foyer/Lobby**
10:30 a.m.-noon Ballroom West	**"What does Accountability in Higher Education Mean to You?" Panel Discussion: A response to the opening plenary panel and to the discussions of the past two days.** **Panelists are: Frederick Volkwein, University at Albany.** **Anne Marie Delaney, Babson College and** **Thomas Flaherty, Central Connecticut State Univ.** Closing Plenary Session
Noon-4:30 p.m.	**Luncheon Meeting of the Steering Committee in P.T.Barnum**

See you next year in Philadelphia

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