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Examining Retention and Contingent Faculty Use in a State System of Public Higher Education

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Abstract

In many cases, state systems of higher education are not only challenged to address decreasing state budgets but are also asked to increase student retention and other measures of student success. The increased use of contingent faculty may help economically, but this trend may have unintended consequences. This research used logistic regression methods to examine six institutions within a public higher education system for the effects of contingent faculty use on first-year student retention. A thorough examination of other traditional variables used in retention studies is also provided. Results are reported by institutional type via Carnegie classification. Most notably, high levels of exposure to part-time faculty in the first year of college are consistently found to negatively affect student retention to the second year. These findings have implications for both policy and practice in the use of contingent faculty across institutional types.

Keywords:

faculty, higher education, higher education policy

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States that both increase production of and retain college graduates generally facilitate a number of economic and social returns for their residents (Bowen, 1997; Groen & White, 2003). To maximize these benefits, state systems of public higher education increasingly have pushed to improve student retention and particularly the retention of high-ability students who have greater earning potential and contribute to a wealthier tax base for the state. Recent state mandates for increased accountability among higher education institutions have also prompted research on student persistence (e.g., Board of Regents of the University System of Georgia, 2008; University of North Carolina Tomorrow Commission, 2007). At the same time, state legislatures continue to reduce financial support for higher education (e.g., Keller, 2009).

The significant reduction in state appropriations has resulted in the implementation of innovative cost-saving measures among public higher education institutions. Institutions of higher education heavily rely on contingent faculty instruction (Gappa, 1984; Leslie, 1998; Schuster & Finkelstein, 2006). Contingent faculty are defined as not only nontenure-track part-time faculty but also as other instructors who lack full faculty status, including full-time fixed-term faculty, graduate assistants, and postdoctoral researchers (American Association of University Professors, 2006). By 2007, part-time faculty appointments made up more than half of the academic workforce at 4-year public and private universities, and now just 3 out of every 10 faculty are on the tenure track (American Federation of Teachers, 2009). Contingent faculty provide institutions with the ability to be more economically efficient, as these faculty generally are cheaper to employ than full-time faculty and offer greater flexibility to institutions (Bettinger & Long, 2006; Gappa, 1984; Leslie, 1998; Liu & Zhang, 2007; Schuster & Finkelstein, 2006). Part-time faculty can cost as much as 80% less than employing full-time faculty (College and University Professional Association for Human Resources, 2001).

Although some institutions have reduced the per-student cost of education through intentional and significant increases in the hiring of contingent faculty and have gained praise from national organizations (e.g., Ashburn, 2006), not all scholars would agree that part-time and other contingent faculty are as capable of meeting institutional demands as their full-time faculty counterparts (Benjamin, 2002, 2003). Recent research suggests that increased reliance on part-time faculty instruction negatively affects student retention (Eagan & Jaeger, 2008; Harrington & Schibik, 2004; Jaeger & Hinz, 2008; Kehrberg & Turpin, 2002; Ronco & Cahill, 2006). Umbach's (2007) work suggests that part-time faculty spend less time preparing for class, have less frequent interactions with students, and use active and collaborative teaching techniques less often then their full-time colleagues.

This study of six institutions within a state 4-year public higher education system investigates the effect of exposure to contingent faculty on students' decisions to persist after their first year. Focusing on decisions of first-year students is critical given that the typical 4-year college/university loses 26% of its students between the first and second years, and approximately 60% of the students who drop out of any given cohort of entering students do so in the first year (Terenzini & Reason, 2005). The first year of college is foundational for securing a return on investment for students, parents, the institution, the state, and society. Although different types of institutions utilize contingent faculty in different ways, their influence on students may be similar. For example, demands for part-time faculty are even greater at community colleges, yet recent research has shown increased exposure to part-time faculty has similar negative effects on student outcomes at community colleges (Eagan & Jaeger, 2009; Jaeger & Eagan, 2009). Research has not explored differences among 4-year institutions in one state system. Looking at one system can offer a broader perspective on this topic, because the institutions within the system define and measure part-time faculty in the same manner.

Conceptual Framework

Though faculty interactions are generally regarded as an important aspect of student persistence (Endo & Harpel, 1982; Gaff & Gaff, 1981; Nora, Barlow, & Crisp, 2005), limited studies actually consider the impact of faculty employment status on students' decision to persist. This study uses the conceptual framework identified by Eagan and Jaeger (2008) that assumes students who are exposed to greater levels of contingent faculty instruction will experience fewer meaningful interactions than those exposed to full-time faculty instruction and thus will become less integrated into the campus academic culture. Students appear to be significantly and negatively affected by having large introductory courses taught by other part-time faculty according to Eagan and Jaeger's research. Pascarella and Terenzini (1977, 2005) asserted that student–faculty interactions, both inside and outside of the classroom learning environment, play a crucial role in the connection between student and institution. This lack of integration may result in a less satisfying experience and a decreased likelihood of persisting (Bean, 1990).

Researchers (Cotten & Wilson, 2006; Endo & Harpel, 1982; Milem & Berger, 1997) have identified a significant and positive relationship between faculty–student interaction and gains in student outcomes, including academic achievement and satisfaction with college experience. Baldwin and

Chronister (2001) noted that contingent faculty may be viewed by students as less stable and less secure. Thus, it is likely that students would be less likely to seek out these individuals as role models and mentors. Bettinger and Long (2006) suggested that contingent faculty may not be as effective as full-time faculty in advising students or in arranging research experiences that would prepare undergraduates for graduate education as well as incorporate them into the undergraduate experience.

Scholars link students' satisfaction with their collegiate experience to an increased likelihood to persist (Bean, 1990); conversely, Bean suggests that as students become more dissatisfied their likelihood of persistence diminishes. Prior research (Cotten & Wilson, 2006; Endo & Harpel, 1982; Pascarella & Terenzini, 1977, 2005) has linked student–faculty interactions to a number of positive outcomes. Given the positive association between student–faculty interactions and persistence, we posit that students who have more meaningful and more frequent interactions with faculty in the first year of enrollment increase their chances of persistence into the second year. Because part-time faculty tend to have a lower level of availability and accessibility compared to their full-time counterparts (Umbach, 2007), we argue that students have fewer opportunities to connect with part-time faculty in meaningful ways, which may negatively influence their overall college satisfaction and likelihood to persist.

Because the outcome examined in this study is student persistence, we also included typical student background variables present in most retention research (Pascarella & Terenzini, 2005; Titus, 2005). Reason (2003) noted three types of controls that consistently emerge as significant predictors of student retention: measures of prior academic achievement, gender, and race. The inclusion of variables regarding financial aid, residency in the first year, and declaration of a major have further increased the ability of retention models to predict student behavior (Pascarella & Terenzini, 2005; Titus, 2005).

Literature Review

Contingent Faculty Characteristics

Schuster and Finkelstein (2006) examined academic staffing patterns over several decades and found that the hiring of contingent faculty has become the norm. In 2003, degree-granting institutions nationwide employed 46.3% of faculty in part-time appointments compared to 35.1% of faculty in tenured or tenure-track appointments (American Association of University Professors, 2006). Public 4-year institutions employed 33.9% of their faculty in

part-time appointments in 2003, a rise from 26.3% in 1987 (Cataldi, Fahimi, Bradburn, & Zimbler, 2005; Kirshstein, Matheson, & Jing, 1997). Whereas the numbers of contingent appointments differs across institutional types and disciplines, Schuster and Finkelstein suggested that this overall staffing shift will have broad implications, which are largely unstudied at present.

Contingent faculty are not a monolithic group and, hence, can be difficult to define (Gappa, 1984). Institutions participating in this study differentiated between full-time and contingent faculty using FTE data, one of the means offered by Leslie (1978). They also indicated whether instructors were on or off the tenure track and whether they were graduate students. Minimal research has disaggregated contingent faculty. Bettinger and Long's (2004, 2006) work does take into account effects of graduate students. Their work suggests that graduate student instructors are not as proficient as either full-time or other contingent faculty in encouraging students to enroll in subsequent courses and have a negative effect on dropout rates.

Contingent faculty provide institutions some financial flexibility (Bettinger & Long, 2006; Gappa, 1984; Leslie, 1998; Liu & Zhang, 2007; Schuster & Finkelstein, 2006), though their increased use is not without scrutiny. Contingent faculty members spend a greater proportion of their overall time teaching, but the initial evidence suggests that these appointees are less available to students, bring less scholarly authority to their jobs, and are not as well connected to the campus culture (Schuster, 2003). Advocates for increased use of full-time faculty note that the increasing utilization of contingent faulty threatens shared governance, academic freedom, and the quality of students' education (Buck, 2001; Thompson, 2003). In an attempt to clarify the real issue, Haeger (1998) writes, "The most important academic concern is the perception that part-time faculty threaten the quality of academic programs in terms of course content, advising, faculty-student interaction, and collegiality within academic departments" (p. 85).

Research has demonstrated that, among categories of contingent faculty, part-time faculty exhibit different job performance compared to other tenure-ineligible colleagues who are employed full-time (Umbach, 2007). Umbach used hierarchical linear modeling techniques to analyze faculty data from the 2004 Faculty Survey of Student Engagement. In his analysis of faculty from 132 colleges and universities, Umbach focused on the relationship between faculty appointments and teaching effectiveness. Part-time faculty were found to spend less time preparing for class, to have less frequent interactions with students both on course- and non–course-related issues, to challenge their students less, and to use active and collaborative teaching techniques less often when compared to their tenured, tenure-track, and tenure ineligible

full-time colleagues. The same study found a difference in part-time faculty members' interactions with students interaction across institutional types, with interactions being lowest at research institutions.

Impact of Contingent Faculty on Student Outcomes

Previous research (Conley, Leslie, & Zimbler, 2002; Gappa & Leslie, 1993; Haeger, 1998; Schuster, 2003; Umbach, 2007) has provided adequate information on the characteristics of contingent faculty as well as their role on college campuses; however, these studies have not fully examined the effects of contingent faculty instruction on student outcomes. Braxton, Bray, and Berger (2000) explored the role of faculty on student persistence but not specifically the differences between contingent and full-time faculty. Given the substantial differences between contingent and other faculty, it is important to understand how these differences affect student outcomes. For example, students' perceptions of faculty members' availability and concern for them has positive and significant effects on persistence (Halpin, 1990; Mallette & Cabrera, 1991). Limited interactions with professors would be as such expected with contingent faculty and may lead to discontent and a level of dissatisfaction or disconnection on the part of the student.

The few existing studies that do address student retention as it relates to part-time faculty usage, with the exceptions of Eagan and Jaeger (2008) and Ronco and Cahill (2006), do not parse out subcategories of contingent faculty in their analyses (Harrington & Schibik, 2004; Jaeger & Hinz, 2008; Kehrberg & Turpin, 2002). Additionally, many of these studies lack robust statistical tests, provide weak measures of exposure to contingent faculty, or suffer from high multicollinearity among independent predictors. Harrington and Schibik examined 7,174 youth entering first-year students at a midsized comprehensive Midwestern university. The study found a significant negative correlation between the percentages of courses taught by contingent faculty and retention rates in the second semester. Yet the Harrington and Schibik study tends to cluster students of lower academic ability with higher percent exposure to contingent faculty instruction.

Kehrberg and Turpin's (2002) study of a regional comprehensive institution concludes that exposure to part-time faculty does not affect the academic performance or retention rates of first-time freshmen. This study calculates percent exposure to faculty types on the basis of number of courses, not on the basis of number of credit hours, which gives equal weight to a one-credit elective and a three- or four-credit core course. Given the variance in credits assigned to particular courses, calculating exposure to contingent faculty

based on the number of classes may misrepresent the actual amount of instructional time spent with part-time instructors. Furthermore, Kehrberg and Turpin did not offer any type of predictive model; instead, they use mean comparisons tests to analyze possible relationships between student outcomes and exposure to part-time faculty.

Ronco and Cahill's (2006) recent study of a public, research-intensive institution showed that retention is primarily predicted by background and educational experience variables; however, the authors found a higher level of attrition among the group of students with the lowest percent exposures to full-time faculty in the first year. Ronco and Cahill's work, discussed further in the Method section, is the most comprehensive to date but still offers only one institution's perspective. Jaeger and Hinz's (2008) study of a single research-extensive university similarly found the relationship between part-time faculty exposure and student retention to be significant and negative. Their work offers a more comprehensive examination of variables related to persistence than previous research but does not disaggregate among contingent faculty.

Contingent faculty offer institutions financial and program flexibility; however, their increased use raises concerns for administrators and policy makers. Could the constraints faced by contingent faculty in relation to resources and time be hampering their relationship with students and thus lead to a negative effect on student outcomes? The lack of any clear data regarding the effects of contingent faculty on student outcomes across the various institutional types governed under a single system of higher education illustrates the need for additional research. The guiding question for this study states, "Does exposure to three categories of contingent faculty negatively affect students' likelihood of being retained after their first year, when controlling for background characteristics, prior achievement, financial aid measures, and enrollment traits?"

Method

Sample Selection

The six institutions in this study are part of the same state system of public higher education; the entire system educates 36% of the state's college students. We selected this system of 4-year public institutions in part because of recent directives to individual institutions to increase student retention and graduation rates. Community colleges are governed by a separate state system and may not be receiving the same mandate to increase retention. In

2005, member institutions attended a system-wide conference on student success, retention, and graduation rates. For the 2006-2007 academic year, these institutions were required to set retention and graduation goals and submit to the state system office a plan for how to achieve these goals.

Data from the National Center for Public Policy and Higher Education (NCPPHE, 2006) actually show that the state system selected for this study retains a high percentage of students from the first year to the second year (80%) in comparison to other states. Yet NCPPHE also reports that this state system is one of the least affordable for its citizens despite legislative mandates to offer public higher education at as low a cost as possible; these affordability challenges may be prompting the system to consider a number of cost-saving measures, including fewer tenured or tenure-track faculty and additional contingent faculty. Increasing retention rates at the same time institutions are considering cost-savings strategies could be counterproductive.

The state system has set up within-system peer groups based on the 2000 Carnegie Classifications; as such, the system includes a total of two doctoral-extensive institutions, four doctoral-intensive institutions, six masters-I institutions, and four baccalaureate general institutions. We invited all institutions in the system to participate; however, a number of institutions were unable to provide comprehensive data on faculty status and hence could not be included in the study. Other institutions chose not to participate due to the significant workload involved in compiling the requested data. The challenges the researchers faced in acquiring the data made it impossible to include all institutions in the system. The findings report data from one doctoral-extensive institution, two doctoral intensive institutions, two masters-I institutions, and one baccalaureate institution. These institutions are all classified as 4-year and primarily residential institutions (Carnegie Foundation for the Advancement of Teaching, 2006).

Institutional research offices from the six universities provided data for at least three cohorts of full-time, first-year students beginning fall 2002, 2003, 2004, and 2005. Retention rates remained stable for each cohort within each of the six institutions. We also ran analyses of variance (ANOVA) on the continuous independent predictors, particularly exposure to part-time faculty, and found that students' exposure to part-time faculty did not significantly differ across cohorts. Additionally, we ran separate instrumental variable probit regressions for each institution and did not detect significant differences in the effects of the independent variables on students' likelihood to be retained. Given these similarities across cohorts and within institutional types, we chose to analyze data across the four institutional types previously described. Student transcript and financial aid data files were obtained from

each institution. These data included student demographics, academic preparation, financial aid, and first-year coursework. Table 1 presents information about each of the six institutions in the study. The first three columns of data were obtained from the Carnegie Foundation for the Advancement of Teaching Web site (2006), and the remaining data reflect information sent by the institutional research offices of the participating schools.

Variables

Institutions in this study distinguished contingent and full-time instructors based on FTE data (generally at or below either 0.98 or 0.99 FTE). Requirements from the state system office dictated how institutions would classify part-time faculty, which provided for consistency across institutions. Additionally, institutions distinguished full-time tenured or tenure-track faculty from their full-time nontenure-track counterparts. From the institutional data on faculty, we categorized contingent faculty in one of three ways: full-time nontenure-track faculty, graduate assistants, and "other" part-time faculty. The "other" part-time faculty classification includes a mix of adjunct faculty, part-time lecturers, and postdoctoral scholars. Each faculty classification is distinct from the others.

Datasets from each institution provided information on the faculty's status for every credit hour in which a student enrolled. With this information, percent exposure to each type of contingent faculty was calculated as the total number of credit hours a student spent with contingent faculty divided by the total number of credit hours a student completed in the first year. To ease interpretation of the results within and across institutional sectors, we recoded this percentage so that a one-unit increase in the variable corresponded to a 10% increase in part-time faculty exposure.

Retention to the fall semester of the second year was the dichotomous dependent variable (1 = *retained*). We created dummy codes for the categorical variables of race, gender (1 = *female*), and student major. Categories for race included Black, Asian American, Hispanic, and Other, with White as the reference group. We categorized majors into six groups: humanities; social sciences; life and medical sciences; physics, math, and engineering; and business. Students who remained undeclared in their academic major at the end of their first year served as the reference group.

Continuous variables in the analyses included age, high school grade point average (GPA), composite SAT scores, and first-year college GPA. We rescaled the SAT variable so that a one-unit increase corresponded to a 100-point increase in SAT composite score. We derived the first-year college GPA

Table 1. Descriptions of Six Study Institutions and Datasets Analyzed

	Total institutional enrollment	Undergraduate instructional program	Undergraduate profile	Number of cohorts	Number of students	Other
Baccalaureate Institution	3,574	Arts and science focus, some graduate coexistence	Full-time 4-year, more selective, higher transfer-in	5	2,659	No graduate student instructors are used
Masters-I Institution (A)	14,653	Professions plus arts and sciences, some graduate coexistence	Full-time 4-year, more selective, higher transfer-in	3	7,531	All first year students required to live on campus
Masters-I Institution (B)	5,027	Balanced arts and sciences/ professions, some graduate coexistence	Full-time 4- year, inclusive	4	3,275	Historically minority-serving institution (Native American)
All masters institutions				7	10,806	
Doctoral-intensive institution (A)	19,846	Balanced arts and sciences/ professions, high graduate coexistence	Full-time 4-year, selective, higher transfer-in	4	10,467	
Doctoral-intensive institution (B)	15,329	Balanced arts and sciences/ professions, high graduate coexistence	Full-time 4-year, selective, higher transfer-in	4	8,758	
All doctoral-intensive institutions				8	19,225	
Doctoral-extensive institution	29,957	Balanced arts and sciences/ professions, high graduate coexistence	Full-time 4-year, more selective, higher transfer-in	4	15,566	

variable based on course data provided by institutions. Each institution provided information on course grades. Based on grade points and the credits associated with each course, we calculated students' GPA at the end of the first year of enrollment.

Other regression variables, shown in Table 2, also received special attention. We included several continuous variables corresponding to students' reported financial need and the amount of aid in different forms (e.g., grants, unsubsidized loans, subsidized loans, and federal work study). We rescaled these financial aid variables so that a one-unit increase corresponded to a $1,000 increase in need or received aid.

Finally, because our analyses focus only on first-time, full-time students, we controlled for students' enrollment intensity. We derived three classifications for enrollment intensity based on the number of credits a student had earned by the end of their first year. Low intensity included students who completed fewer than 29 credits by the end of the first year. Moderate intensity corresponded to completers of 29 to 32 credits. Lastly, high enrollment intensity referred to students completing more than 32 credits by the end of their first year.

Data Analysis

Analyses included descriptive statistics and instrumental variable probit regression. Because students may not have equal probabilities of enrolling in classes with part-time faculty, we needed to account for the propensity students had for their level of exposure to part-time faculty. Without accounting for factors, observed or unobserved, which may contribute to a students' likelihood of a particular level of exposure to part-time faculty, causal inferences cannot be made. Results from standard logistic or probit regressions may be biased, as students at higher levels of exposure to part-time faculty may be quite different from their peers who have lower levels of exposure (Cullen, Jacob, & Levitt, 2005).

Instrumental variable analysis, in this case, examines how a set of variables predict students' level of exposure to part-time faculty. These variables should be significantly related to students' exposure to part-time faculty but unrelated to students' likelihood to be retained. If a variable in the first stage of analysis has a correlation with the outcome variable, its relationship should occur through the instrumental variable (Cullen et al., 2005). In this case, students' demonstrated financial need represents the primary variable in the first stage of analysis predicting students' exposure to part-time faculty. Because our data did not include information about students' socioeconomic

Table 2. Means for Regression Variables by Classification Category

	Doctoral-extensive	Doctoral-intensive	Masters I	Baccalaureate
Dependent variable				
Retained to second fall semester	0.90	0.76	0.80	0.78
Independent variables				
Student background characteristics				
Black	0.10	0.15	0.09	0.03
Native American	0.01	0.00	0.06	0.00
Asian	0.04	0.04	0.02	0.02
Hispanic	0.02	0.02	0.02	0.02
Other race	0.01	0.02	0.02	0.03
White	0.81	0.76	0.79	0.90
Female	0.44	0.61	0.51	0.60
Age	18.30	18.50	18.44	18.03
High school GPA	3.59	3.49	3.34	3.74
Total SAT score	1190.73	1060.44	1071.38	1167.89
Recorded financial need	3.44	4.10	3.71	3.11
College-entry characteristics				
Off-campus housing	0.23	0.27	0.12	0.15
Out-of-state resident	0.10	0.11	0.10	0.18
Grant aid (US$1,000)	3.31	1.82	2.02	2.12
Subsidized loans (US$1,000)	0.57	0.95	1.32	0.07
Unsubsidized loans (US$1,000)	1.69	1.65	2.48	0.77
Federal work study aid ($1,000)	0.06	0.08	0.09	0.06
Major: humanities	0.05	0.11	0.12	0.04
Major: social sciences	0.12	0.22	0.26	0.02
Major: life/medical sciences	0.16	0.13	0.06	0.02
Major: physics, math, engineering	0.38	0.09	0.06	0.05
Major: business	0.07	0.11	0.09	0.01
College academic characteristics				
First-year GPA	2.97	2.57	2.62	2.80
Low enrollment	0.37	0.36	0.32	0.36
High enrollment	0.29	0.27	0.32	0.27
Faculty exposure variables				
Percent exposure to nontenure-track full-time contingent faculty instruction	36.00	20.46	15.35	23.70
Percent exposure to "other" part-time faculty instruction	23.91	22.58	35.37	26.22
Percent exposure to graduate assistant instruction	7.46	9.73	5.33	NA

status, we relied on demonstrated need as a proxy for this factor. Students with higher levels of need tend to enroll and register for courses later, which may mean that many sections with full-time instructors have reached maximum capacity. Given this possibility, students with higher levels of need may have an increased likelihood to be exposed to higher levels of part-time faculty. Additionally, after taking into account the effect of need on propensity for greater exposure to part-time faculty as well as accounting for financial aid received, we do not expect a direct effect of need on students' likelihood to be retained. Instead, the effect of need operates through exposure to part-time faculty.

The first-stage analysis also has controls for students' age and high school GPA. Students with lower levels of high school achievement, as measured by high school grades, may enroll in college later. This delayed decision tends to translate into fewer courses with full-time or tenured faculty and, thus, a greater propensity to register for classes taught by part-time faculty. Age may also affect students' likelihood to take courses with part-time faculty. Given that part-time faculty tend to teach courses at less desirable times for traditional-aged students, such as at night and on weekends, older students, who may have full-time jobs during the day may be more likely to take evening courses with part-time faculty. Equation 1 represents the first stage of analysis for instrumental variables,

$$y = a + \beta_1 \text{ Need} + \beta_2 \text{ Age} + \beta_3 \text{ HSGPA} + \mu \tag{1}$$

where y represents exposure to each of the three types of contingent faculty (i.e., full-time, nontenured faculty; graduate assistants; and other part-time faculty); need, age, and HSGPA represent the variables previously described, and μ corresponds to random error. The full second stage equation is given by Equation 2.

$$\begin{aligned}\log\left[\frac{\varphi}{1-\varphi}\right] = {} & \beta_0 + \beta_1 \mathit{Black}_i + \beta_2 \mathit{Asian}_i + \beta_3 \mathit{Hispanic}_i + \beta_4 \mathit{Native\ American}_i \\ & + \beta_5 \mathit{Other\ Race}_i + \beta_6 \mathit{Female} + \beta_7 \mathit{Age}_i + \beta_8 \mathit{TotalSAT}_i \\ & + \beta_9 \mathit{Off\text{-}Campus\ Resident}_i + \beta_{10} \mathit{Out\text{-}Of\text{-}State\ Resident}_i \\ & + \beta_{11} \mathit{Enrollment\ Intensity}_i + \beta_{12} \mathit{Grants}_i + \beta_{13} \mathit{Work\ Study}_i \\ & + \beta_{14} \mathit{Subsidized\ Loans}_i + \beta_{15} \mathit{Unsubsidzed\ Loans}_i + \beta_{16} \mathit{Major}_i \\ & + \beta_{17} \mathit{Predicted\ Contingent\ Faculty\ Exposurei} + \beta_{18} \mathit{First\ Year\ GPA}_i \\ & + \mu_i \end{aligned} \tag{2}$$

where *i* denotes an individual student, μ indicates the error term, and the variables names are those previously described. Importantly, the variable,

predicted contingent faculty exposure, represents the three distinct types of exposure previously described as predicted by Equation 1. We relied on the ivprobit command in STATA to construct these models. Identical models were run for each institutional classification category, as these institutional types have distinct characteristics that warrant separate analyses. The findings of this study report the marginal effects (ME) for each aggregated sample by Carnegie classification.

Limitations

This study is limited in several ways. First, the analyses include 6 distinct institutions within a state system of 16 unique institutions, providing a general overview of possible connections between student persistence and contingent faculty use rather than an exact detailed picture from each institution. Second, although we conducted separate analyses by institutional type, we continue to have a design where students are nested within multiple institutions, which could not be addressed in this study, based on the limited number of institutions. Third, we were not provided information about remedial courses, so we were unable to exclude these courses from our analyses. This limitation may bias our estimates of the effect of exposure to part-time faculty on student retention, as part-time faculty have an increased propensity to teach remedial courses. Likewise, the datasets did not include information about the number of credits students had earned prior to beginning their first year of college. These credits include transfer credits as well as units earned from advanced placement (AP) courses. The dataset did not provide information about the length of service of the part-time faculty. Finally, this study includes first-time, full-time students, so results cannot be applied to students who enroll part-time during their first year of college. Given these limitations, this research is still valuable in exploring the question of exposure to contingent faculty on retention, particularly because it is the first study to address a broad range of variables in a state system. Results from this study may help administrators, scholars, and policy makers better understand this unique faculty subgroup.

Findings

Table 2 presents the basic demographic information for each Carnegie Classification category. Nationally, average unadjusted rates or retention into the second year range from 72% to 79% at public institutions (Pascarella & Terenzini, 2005). Doctoral institutions have also been found to have higher

rates of retention than baccalaureate institutions (Pascarella & Terenzini, 2005); this finding is reflected in this system of schools, with 90% of students at the doctoral-extensive institution being retained as compared to 80% and 78% at the masters-I and baccalaureate institutions, respectively. Regarding faculty instruction in the first year, among all types of institutions, the baccalaureate institution utilizes contingent faculty the least in the first year (49%), which may reflect the fact that this particular type of institution does not utilize graduate students as instructors. Students at the doctoral-extensive institution had the highest average exposure to contingent faculty instruction in their first year, as the average student at this institutional type had approximately 68% of all credits with contingent faculty. Across the classifications of contingent faculty, we found a great deal of variation among the four institutional types. The average student at the doctoral-extensive university spent as much as 36% of his or her credits with full-time, nontenure-track faculty compared with just 15.35% for students at masters-I institutions. In contrast, students at masters-I institutions had the highest average exposure to "other" part-time faculty instruction (35.37%). Students attending one of the doctoral-intensive institutions experienced the highest average exposure to graduate student instruction at 9.73% of their first-year credits.

Tables 3 to 6 report the instrumental variable probit regression results by institutional type. We report the ME as well as the probit coefficients. ME represent the change in probability of retention associated with a one-unit change in the independent variable, controlling for the means of all other variables in the model. The following sections further detail the findings from the regressions by Carnegie classification.

Doctoral-Extensive Institution

Table 3 presents the results of the analysis for the one doctoral-extensive institution, which supplied data on 4 cohorts of students for a total sample of 15,566 students. Results from the probit regression model suggest a significantly negative relationship between exposure to "other" contingent faculty instruction and retention (ME = –0.04, $p < .05$). This finding suggests that, for every 10% increase in students' exposure to "other" contingent faculty, their probability of being retained dropped by 4%, holding all other variables constant at their means. Exposure to graduate student instruction also negatively affected students' probability of being retained into their second year. A 10% increase in exposure to graduate student instruction decreased retention probability by approximately 3%. The model did reveal a negative but nonsignificant effect of students' exposure to full-time, nontenure-track faculty.

Table 3. Instrumental Variable Probit Regression of First-Year Retention for Doctoral-Extensive Institutions

	Coefficients	*SE*	Marginal effects
Student background characteristics			
Black***	.37	0.06	0.04
Native American	.14	0.17	0.02
Asian	–.01	0.08	0.00
Hispanic	.07	0.10	0.01
Female***	–.16	0.03	–0.02
Total SAT score***	–.07	0.02	–0.01
College entry characteristics			
Off-campus housing*	.08	0.04	0.01
Out-of-state resident***	.44	0.05	0.08
Grant recipient	.02	0.01	0.01
Subsidized loan recipient	.01	0.03	0.00
Unsubsidized loan recipient	.01	0.01	0.00
Federal work study recipient	.26	0.13	0.03
Major: humanities**	–.26	0.09	–0.04
Major: social sciences	–.09	0.05	–0.01
Major: life/medical sciences	–.13	0.08	–0.02
Major: physics, math, engineering***	.15	0.05	0.02
Major: business	.07	0.08	0.01
College academic characteristics			
First-year GPA***	.53	0.05	0.08
Graduate instruction*	–.23	0.11	–0.03
Other contingent faculty instruction*	–.28	0.13	–0.04
Nontenure-track, full-time instruction	–.11	0.06	–0.02
Low enrollment intensity*	–.37	0.04	–0.06
High enrollment intensity*	.05	0.05	0.01
Wald test of exogeneity	4.39	—	—

Note: The marginal effects are evaluated at the means of the variables.*
$p < .05$. **$p < .01$. ***$p < .001$.

Other variables emerging as significant included first-year GPA, total SAT score, having in-state residency, and being Black. Black students (ME = 0.04, $p < .001$) were significantly more likely to be retained than their White counterparts. In-state students had a significantly higher probability of retention compared to students who resided outside the state of the institution (ME = 0.08, $p < .001$). In contrast, a 100-point increase in composite SAT scores corresponded to a 1% decrease in students' probability of retention (ME = –0.01, $p < .001$). Cumulative first-year GPA had a significantly

Table 4. Instrumental Variable Probit Regression of First-Year Retention for Doctoral Intensive Institutions

	Coefficients	SE	Marginal effects
Student background characteristics			
Black	.06	0.03	0.02
Native American	.07	0.11	0.03
Asian	–.04	0.04	–0.01
Hispanic	–.03	0.05	–0.01
Female***	.08	0.02	0.03
Total SAT score	–.01	0.01	0.00
College entry characteristics			
Off-campus housing***	–.05	0.02	–0.02
Out-of-state resident	–.05	0.04	–0.02
Grant recipient	.03	0.02	0.01
Subsidized loan recipient	.04	0.02	0.01
Unsubsidized loan recipient	–.01	0.01	0.00
Federal work study recipient	–.10	0.08	0.03
Major: humanities***	.26	0.03	0.10
Major: social sciences***	.28	0.02	0.11
Major: life/medical sciences***	.48	0.03	0.18
Major: physics, math, engineering***	.18	0.03	0.07
Major: business***	.25	0.03	0.10
College academic characteristics			
First-year GPA*	.13	0.05	0.05
Graduate instruction***	.05	0.00	0.02
Other contingent faculty instruction***	.07	0.01	0.03
Nontenure-track, full-time instruction***	.04	0.01	0.03
Low enrollment intensity	–.06	0.05	–0.02
High enrollment intensity	0	0.02	0.00
Wald test of exogeneity***	14.36	—	—

Note: The marginal effects are evaluated at the means of the variables.
*$p < .05$. **$p < .01$. ***$p < .001$.

positive relationship with persistence, as a 1-point increase in first-year GPA corresponded to an 8% increase in students' probability of persistence (ME = 0.08, $p < .001$).

Enrollment intensity also emerged as a significant predictor of persistence, as students who completed fewer than 29 credit hours by the end of the first year were about 6% less likely to be retained than their peers who completed between 29 and 32 credits. Students who earned more than 32 credits in their first year of college were about 1% more likely to be retained,

Table 5. Instrumental Variable Probit Regression of First-Year Retention for Masters Institutions

	Coefficients	*SE*	Marginal effects
Student background characteristics			
Black	.13	0.10	0.03
Native American*	–.33	0.16	–0.10
Asian	–.18	0.13	–0.05
Hispanic	–.21	0.11	–0.06
Female	–.04	0.03	–0.01
Total SAT score***	–.08	0.02	–0.02
College-entry characteristics			
Off-campus housing	–.03	0.05	–0.01
Out-of-state resident***	.33	0.05	0.10
Grant recipient***	.10	0.01	0.03
Subsidized loan recipient	.03	0.02	0.01
Unsubsidized loan recipient	.01	0.01	0.00
Federal work study recipient	.01	0.05	0.00
Major: humanities	.07	0.05	0.02
Major: social sciences	.05	0.04	0.01
Major: life/medical sciences	.03	0.08	0.01
Major: physics, math, engineering	.03	0.07	0.01
Major: business**	.17	0.06	0.04
College academic characteristics			
First-year GPA***	.36	0.02	0.09
Graduate instruction***	–.09	0.03	–0.02
Other contingent faculty instruction***	–.27	0.06	–0.07
Nontenure-track, full-time instruction***	–.11	0.03	–0.03
Low enrollment intensity***	–.52	0.05	–0.14
High enrollment intensity	.05	0.05	0.01
Wald test of exogeneity***	19.21	—	—

Note: The marginal effects are evaluated at the means of the variables.
*$p < .05$. **$p < .01$. ***$p < .001$.

compared to their peers with moderate levels of enrollment. Students who declared majors in physics, math, or engineering were about 2% more likely to persist, compared to their peers who did not declare a major by the end of their first academic year.

Doctoral-Intensive Institutions

Two institutions at the doctoral-intensive level were included in the study, providing 8 cohorts of data for a total of 19,225 students. Findings from the

Table 6. Instrumental Variable Probit Regression of First-Year Retention for Liberal Arts Institution

	Coefficients	*SE*	Marginal effects
Student background characteristics			
Black	–.18	0.12	–0.07
Native American	–.02	0.30	–0.01
Asian	.07	0.15	0.03
Hispanic***	–.30	0.15	–0.12
Female	.04	0.04	0.02
Total SAT score***	–.13	0.02	–0.05
College-entry characteristics			
Off-campus housing***	–.14	0.06	–0.06
Out-of-state resident	.01	0.05	0.00
Grant recipient***	.14	0.03	0.06
Subsidized loan recipient**	.33	0.13	0.13
Unsubsidized loan recipient***	.10	0.02	0.05
Federal work study recipient	.21	0.28	0.08
Major: humanities	.17	0.09	0.07
Major: social sciences	.19	0.12	0.07
Major: life/medical sciences	.24	0.17	0.08
Major: physics, math, engineering	.11	0.09	0.06
Major: business	.22	0.14	0.08
College academic characteristics			
First-year GPA	.04	0.03	0.02
Other contingent faculty instruction***	–.06	0.01	–0.02
Nontenure-track, full-time instruction***	–.04	0.01	–0.02
Low enrollment intensity***	.13	0.05	0.05
High enrollment intensity	–.05	0.05	–0.02
Wald test of exogeneity	.28	—	—

Note: The marginal effects are evaluated at the means of the variables.
*$p < .05$. **$p < .01$. ***$p < .001$.

doctoral-intensive institutions significantly differed from the findings of the other three institutional types. Students at these institutions experienced a small increase in their retention probabilities as their exposure to contingent faculty increased. The results for the doctoral-intensive institutions suggest a significant, positive relationship between exposure to "other" contingent faculty and students' probability of retention. Specifically, a 10% increase in exposure to "other" contingent faculty results in a 3% increase in students' probability of retention when controlling for other independent variables at their means. Likewise, a 10% increase in exposure to graduate student

instruction, or to full-time, nontenure-track faculty instruction, translates into a 2% and 3% increase, respectively, in students' likelihood of being retained.

Similar to students at the doctoral-extensive institution, students attending the doctoral-intensive institutions with higher GPAs have significantly increased probabilities of being retained compared to their peers with lower levels of academic performance (ME = 0.05, $p < .05$). A 1-point increase in first-year GPA corresponded to a 5% increase in students' probability of persistence into the second year. Unlike their peers at the doctoral-extensive university, students enrolled at the doctoral-intensive institutions did not experience significant effects from their enrollment intensity on their likelihood to persist.

Unlike students at the doctoral-extensive institution, students attending doctoral-intensive institutions that came from within the state were not significantly more likely to be retained than their out-of-state peers. Finally, we found several significant positive associations between students' major and persistence. Those who declared a major in any of the five general areas included in the model had a higher probability of retention, compared to students who did not declare a major during the first year of college.

Masters-I Institutions

Two institutions at the masters-I level were included in the study, providing 7 cohorts of data for a total of 10,806 students. Although these institutions are clearly different as noted by Table 1, separate regression analyses indicated the key variables of interest did not affect first-year retention in significantly different ways. Exposure to "other" contingent faculty significantly reduced students' probabilities of being retained, as a 10% increase in exposure to this type of faculty resulted in a 7% decrease in students' probability of retention. Similarly, a 10% increase in exposure to graduate student instruction and full-time, nontenure-track faculty instruction reduced students' probability of retention by 2% and 3%, respectively.

Students who achieved higher first-year cumulative GPAs had significantly increased likelihoods of retention than their peers who did not do as well academically (ME = 0.09, $p < .001$). A 1-point increase in GPA corresponded to a 9% increase in students' probability of persisting. Enrollment intensity appeared to have a significant association with persistence. Students completing fewer than 29 credits were 14% less likely to reenroll in the fall semester of their second year compared to their peers who completed between 29 and 32 credits. Having a high enrollment intensity did not significantly affect students' probability of retention.

Students coming from within the state were about 10% more likely to persist compared to their out-of-state peers. Students who majored in business were about 4% more likely to be retained than their peers who did not declare a major.

Baccalaureate Institution

The single baccalaureate institution included in the study provided data on five cohorts totaling 2,659 students. Results suggest that students experience a small but significant negative effect on their probability of being retained from exposure to "other" contingent faculty. A 10% increase in exposure to other contingent faculty corresponds to a 2% reduction in students' probability of being retained. Likewise, a 10% increase in exposure to full-time, nontenure-track faculty decreases the chances of retention by 2%. This particular institution had no graduate student instruction; thus, we did not include that variable in the analysis.

Considering other academic-related variables, we found no significant association between persistence and students' first-year GPA at the baccalaureate institution. Additionally, we found a significant positive relationship between enrollment intensity and retention. Completing fewer than 29 credits in the first year corresponded to a 5% increase in students' probability of persistence when compared to their peers who completed between 29 and 32 credits. We found no significant effects on retention from declaring an academic major.

Discussion and Implications

Several findings from the final instrumental variable probit regression models are relatively consistent across institutional types. If the greatest percentage of attrition occurs during the first year of college (Terenzini & Reason, 2005) and students in this study average more than half of their courses with contingent faculty in the first year, at three of the four institutional types, we would expect to see the probability of retention for students' with average levels of exposure to contingent faculty decrease by anywhere from 10% to 30%. For example, students with average levels of exposure to full-time, nontenure-track, "other" contingent, and graduate assistant faculty may be as much as 30% less likely to persist, compared to their peers who have only full-time faculty. Given these findings, employment status of faculty deserves further discussion. At all but one institution, more than 50% of the credits taken by students during their first year were led by a contingent faculty member.

This study was one of the first studies to disaggregate contingent faculty. At the doctoral-extensive, masters, and baccalaureate institutions, we found a significant negative relationship between exposure to other contingent faculty and retention. Likewise, at the doctoral-extensive and masters institutions, results indicated that students' probability of persistence decreased as their exposure to graduate instruction increased. This is consistent with work by Bettinger and Long (2006) who note that, as the proportion of courses a student takes from a graduate student increases, so does their likelihood of dropping out. They add that graduate student teaching instructors are often not as proficient as either their full-time or part-time faculty in relation to encouraging students to enroll in subsequent courses. Other work (Borjas, 2000; Norris, 1991) with graduate student instructors has focused on international students and nonnative English-speaking students. These authors offer mixed findings, yet they suggest that graduate students may not be able to assist new students in their transition as effectively as full-time faculty. Students may have difficulty interacting with graduate students who are not Native English-speaking instructors, which may result in a less satisfying experience and a decreased likelihood of persisting (Bean, 1990). In addition, graduate students have multiple priorities and thus may not be as readily available to connect new students with campus resources. Finally, graduate students are often involved in large introductory courses, which, Eagan and Jaeger (2008) concluded, have significant negative effects on students likelihood to persist.

At the masters and baccalaureate institutions, we found a negative relationship between retention and exposure to full-time, nontenure-track faculty. This is an important finding in relation to Umbach's (2007) work, which suggests that this faculty subgroup is in some ways more similar to tenured/tenure-track faculty than to part-time faculty and thus may have different effects on students. Umbach found that tenure-ineligible faculty spend more time preparing for class but engage with students less frequently outside of class than their tenure-eligible counterparts. Our research suggests that at masters and baccalaureate institutions in this study full-time, nontenure-track faculty still have a negative effect on students' likelihood of persisting. Research (Pascarella & Terenzini, 1977, 2005) suggests that student–faculty interactions, both inside and outside of the classroom learning environment, play a crucial role in the connection between student and institution. Thus, greater levels of contingent faculty instruction, despite whether these faculty are working full-time or part-time, typically have a negative effect on student persistence.

At the doctoral-intensive institutions included in the study we found that part-time faculty had positive effects on student persistence. This finding contradicts recent research (Eagan & Jaeger, 2008; Harrington & Schibik, 2004; Jaeger & Hinz, 2008; Kehrberg & Turpin, 2002; Ronco & Cahill, 2006), which examined part-time faculty and student outcomes. This finding led the researchers to further examine these institutions. Three unique characteristics of these institutions were identified through personal communications with senior campus administrators. The first characteristic is a philosophy toward part-time faculty as important contributors to student learning. Both institutions provide support for contingent faculty development, which is not the case at the other institutions in the study. One institution has included part-time faculty in new faculty orientation and other similar programs for over a decade. The second characteristic identified was a focus on challenges that part-time faculty face, including large lecture courses and lack of knowledge about campus resources used to support student learning. Finally, institutional administrators conveyed a link between support for part-time faculty and student persistence prior to knowledge of their own campus results. Although a rigorous qualitative study was not conducted at these institutions, apparent differences were found when researchers asked campus administrators from all institutions to provide information about support for contingent faculty.

Several other variables demonstrated consistent and significant trends across most institutional types. First-year GPA was significantly and positively related to retention across doctoral-extensive, doctoral-intensive, and masters institutions, which follows Pascarella and Terenzini's (2005) finding that "virtually without exception, students' grades make statistically significant, frequently substantial, and indeed often the largest contribution to student persistence and attainment" (p. 397). At the doctoral-extensive institution, Black students were more likely to be retained than their White counterparts. From the data gathered for this study, it is unknown whether this finding reflects programmatic successes that are context specific or that these students were able to connect with more of their minority peers as the largest minority group present within each of these institutional types.

In-state residency status positively predicted retention at the doctoral-extensive and masters institutions. The system of schools in this study enforces a cap on out-of-state admissions; in recent years, heated public discussions have ensued when the system proposed an increase in the cap to attract more high-achieving out-of-state students to the state. This study suggests that those out-of-state students currently attending several of the system schools are far less likely to be retained than their in-state counterparts, even

after controlling for prior academic ability, financial aid variables, and first-year academic performance. The repercussions of such a policy change are uncertain; an increase in out-of-state students may mean an increase in the number of students who are not retained at each institution. On the other hand, an increase in the number of out-of-state students may have a positive impact on their retention, as these students would be able to connect with more individuals in a similar out-of-state residency situation.

Findings from this study may have several implications for both policy and practice. First, high levels of exposure to part-time faculty instruction in the first year appear to have significantly negative relationships with student persistence into the second year. Higher education officials should consider how increased use of part-time faculty, particularly in the first year, can be addressed through hiring policies and practices in order to balance budgetary challenges with the overarching concern of student success. Administrators could consider offering full-time faculty incentives to teach first-year students, particularly larger section courses, which is already taking place at one of the doctoral-intensive institutions. Utilizing the talents of part-time faculty in upper division courses is also a possibility. The key issue for administrators and policy makers to consider is the extent to which increasing the number of part-time faculty members at an institution to save on instructional costs reduces the likelihood of a student persisting and thus adds a significant cost to the institution. In addition, it is important to consider this issue because most hiring decisions are made on the department level, whereas students in their first year are taking courses across the institution. Institutional officials may not be fully aware that some first-year students are taking all of their courses with part-time faculty because hiring decisions are not made at the institutional level. The researchers are not suggesting that hiring decisions should be made at any level other than the department, but consideration should be given for the numbers of part-time faculty in first-year student courses. Officials and policy makers need to understand the implications of significant numbers of courses being taught by part-time faculty at the introductory level.

A second implication relates to the data collection; obtaining specific data from campus institutional research offices proved to be a challenging undertaking. Several institutions were not able to identify subgroups within their part-time faculty. Other institutions were not able to link their part-time faculty to particular course sections and thus were unable to provide the necessary data for this study. Although the state system office required this information, several individual campuses could not provide it, thus presenting a challenge if system-level analysis is needed. These challenges pose significant limitations for institutions that want to better understand the role

that contingent faculty play on their respective campuses. Institutional researchers who are unable to link faculty and course data are also not able to provide critical information to decision makers.

Without appropriate data, campus administrators are unable to determine whether specific courses would be better served by full-time faculty or whether graduate teaching assistants play a role in the persistence of students. It could be a reality that more courses are taught by graduate students as institutions face severe economic challenges, lay off part-time faculty, and do not hire full-time faculty. Perhaps current graduate students, by virtue of also being students themselves, are not aware of the critical role they play in mentoring and guiding new students. Graduate students may not fully understand the critical link that faculty, and in this case graduate students who also serve as faculty, play in connecting students to the institution (Bettinger & Long, 2006; Pascarella & Terenzini, 1977, 2005).

Finally, the state system in this study, like many systems of higher education throughout the country, continues to face financial constraints. Given these financial constraints, the state systems are not only demanded to reduce costs but also improve outcomes; one such outcome is retention. This study suggests that multiple factors must be considered when addressing retention questions, including the utilization of contingent faculty. In addition to contingent faculty usage and other factors, this research highlighted the residency status of students as an important predictor variable.

Conclusion and Implications for Future Research

After controlling for student background characteristics, prior achievement, financial aid measures, and enrollment traits, the significant negative relationship between retention and high levels of exposure to part-time faculty persisted across three of the four institutional types. Hence, institutions of all types that are serious about increasing efforts to retain students would benefit from similar consideration of their use of this instructor group, particularly in the first year. Although findings from this study may lend support to decisions to decrease utilization of part-time faculty, it is clear that contingent faculty are not a homogenous group; thus, such a recommendation would be inappropriate. Institutional leaders should first consider how contingent faculty are utilized (e.g., which courses they teach and what types of students are in those courses). Second, institutional researchers along with campus leaders must be able to delineate the types of contingent faculty within their

institution. Any policy change should consider the unique categories of contingent faculty and their respective effects on student persistence.

Course-level retention investigations, which Seidman (2005) suggests deserve additional inquiry, may provide additional information for educators and policy makers. Eagan and Jaeger (2008) investigated contingent faculty usage in gatekeeper courses and suggested that decision makers give careful consideration when trying to reduce expenses through the use of such faculty in large, introductory courses. As additional research supports the concern about increased use of contingent faculty in certain courses, institutional leaders should consider the numbers of courses at the introductory level being taught by contingent faculty. Are too few full-time faculty engaged in courses with first-year students?

Future research must address the quality of instruction, as this research focused solely on quantity and did not consider what was happening within each classroom taught by a contingent faculty member. Though this study makes important strides in differentiating between types of contingent faculty, characteristics such as length of service as an instructor, length of current appointment at the particular institution, motivations for teaching, other employment held while teaching, and specific instructional practices are not included as variables and should be the focus of future research on contingent faculty. Of course, some of this information is far more difficult to obtain and would require qualitative analysis as well as quantitative.

The need to accommodate increased enrollments while improving economic efficiency has contributed to the rapid increase in the employment of contingent faculty. Although short-term institutional responses to the current economic crisis may be to reduce contingent faculty use, it is clear that, as the demands for additional course offerings increase, it is unlikely those demands will be met by hiring additional tenured or tenure-track faculty. Institutions that are able to negotiate the current budget crisis will need to accommodate the growing student population that is also common in poor economic times. The result may be even greater numbers of contingent faculty in years to come when financial crises subside.

Colleges and universities will continue to struggle with competing financial demands; thus, it is imperative that we improve our understanding of part-time faculty, which includes the needs and desires of this group. Future research needs to explore the cost efficiency of increased numbers of contingent faculty. At present colleges, universities, and system offices are not looking at the use of contingent faculty as an institutional or system issue, yet first-year student exposure to contingent faculty is having institutional, and for some part, system-level retention effects.

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Bios

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