

 THE RESEARCH AGENDA

Toward an Institutional Databases Audit to Improve College Student Persistence

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The “institutional databases audit” addresses common challenges of retention research by viewing existing databases and key surveys as resources for analyzing persistence rates. Such an audit helps verify whether student database elements have theoretically derived research referents. Positive results show that institutions can acquire greater understanding of the importance of student databases and data elements in relation to retention rates. The article concludes with descriptions of uses of the audit.

Introduction and Literature Review

College and university leaders focus on student retention rates because student departure negatively affects the stability of institutional enrollments, budgets, and public perceptions of the quality of the student experience. Hagedorn (2005) posits that retention is an institutional measure whereas persistence is a student measure. In other words, institutions retain students, and students persist. Accordingly, institutional efforts to increase their retention rates depend on increasing students’ persistence.

What types of activities are colleges and universities undertaking to address student persistence? The contention is that institutional studies that strive to describe and understand student persistence constitute a fundamental type of institutional activity on the basis of which colleges and universities develop policies and practices designed to increase student persistence.

Institutional studies include descriptions of rates of persistence, comparisons between retained and non-retained students on selected factors, studies of students who depart (so-called “autopsy studies”), bivariate studies, and multivariate studies (Braxton, McKinney and Reynolds 2006; Jones and Braxton 2009). Multivariate studies occur less frequently than other types of institutional studies (Braxton, McKinney and Reynolds 2006; Jones and Braxton 2009).

Multivariate studies are the most rigorous type of institutional study. Theories postulate student persistence as a longitudinal process comprising multiple concepts (Braxton, *et al.* 2014; Tinto 1975, 1993). Consequently, multivariate studies provide a vehicle for the testing of theories of college student persistence. Although multivariate studies are the gold standard of institutional studies, colleges and universities may choose not to conduct theory-driven, multivariate studies of student

persistence. A lack of resources—financial, time, and staff—may prevent institutions from conducting such studies. The pressure for timely information about student persistence also may prevent some colleges and universities from conducting theory-based, multivariate studies as the collection of data for such studies may transpire over a period of one year or more before results become available for dissemination.

Multivariate studies, while highly desirable for predictive analysis, may prove particularly difficult when working with limited data and small populations. Advanced analysts could use techniques such as bootstrapping or Bayesian methods for small samples, yet these accommodations have their limitations, especially when using multilevel or cluster data structures that are ubiquitous in educational research (McNeish 2017). For instance, this study's research team encountered reliability issues for multivariate predictive models; this was one of the motivators for shifting focus to better understanding and improving databases with a theoretical lens.

Bivariate studies and autopsy studies also present challenges. Bivariate studies focus on zero-order correlations of the possible factors that bear a relationship with the focal factor and student persistence. Challenges include the identification and collection of data to conduct these zero-order correlations. Autopsy studies involve either the administration of surveys or in-person interviews with students who have withdrawn from the focal college or university (Terenzini 1982). Both types of studies require institutional resources.

This article presents the institutional databases audit as an approach by which to address some of the challenges of retention research. This approach views existing institutional student databases and results of external and internal surveys as resources for descriptions of institutional rates of persistence, comparisons between retained and non-retained students on selected factors, bivariate studies, and multivariate studies. Their value is in helping confirm whether elements of student databases resonate with or “tap” into theory-based research findings derived from the literature on college student retention. Such an audit addresses the question “Do the available data elements of a student database at

an institution have a research referent?” Through such audits, colleges and universities can acquire greater understanding of the importance of student databases and their data elements to their efforts to increase student retention rates.

Generally, student information exists in silos. An audit of existing institutional student databases could result in a strategically linked and unified database derived from various databases that exist all over campus. In a siloed system, campus partners are often unable or unwilling to share information. Offices that deal directly with students (*e.g.*, admissions, academic affairs, student affairs, career services, alumni relations) typically maintain discrete databases, whether in the form of hard copy files, Excel spreadsheets, or in the cloud. This means that various campus offices might be asking students for the same information and duplicating data across disparate databases. What if, rather than linking disparate datasets and pieces, those datasets were strategically linked to established and empirically supported theoretical concepts? That is one outcome of an institutional database audit.

The next section describes a methodology used to conduct an institutional database audit. Subsequent sections outline the results and uses of this approach. Through the presentation of these uses, the value and utility of this approach to colleges and universities will become more apparent.

The Methodology of an Institutional Databases Audit

The methodology for constructing an institutional databases audit includes three parts: structuring; scaffolding; synthesizing. This methodology is referred to as “3S.” The 3S methodology is best utilized as a sequential iterative process that should be repeated at least three times—ideally, by at least two research team members. The iterative nature of the 3S methodology serves at least two purposes: First, it allows subsequent parts of the methodology to inform preceding parts in a manner similar to a sociological mixed methods research design in which survey analyses might inform the strategy with which a researcher approaches semi-structured

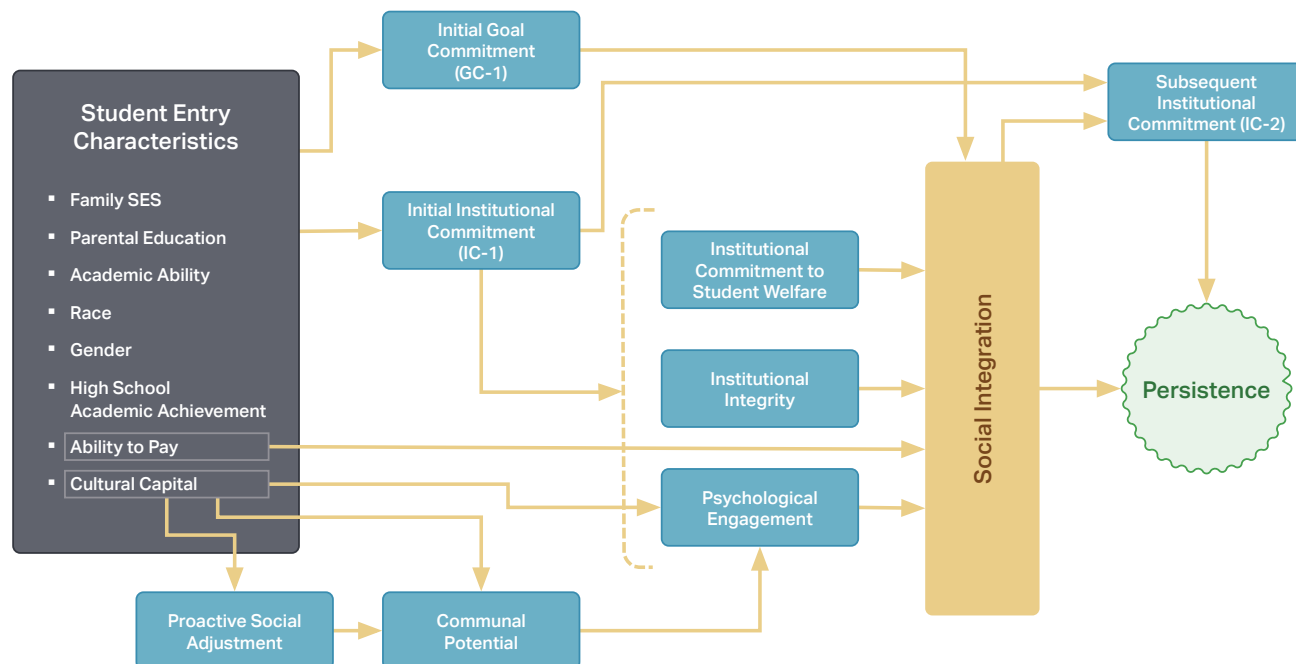


FIGURE 1 ► Revision of the Theory of Student Persistence in Residential Colleges and Universities

Based on Braxton *et al.* (2014, 214)

interviews (Pearce 2012). Second, if multiple team members engage in the process, they can confirm and/or challenge each other's findings and, hence, further refine the findings.

Part I: Structuring

The necessity of structuring stems from the wide and deep field of college student retention. Whereas initial theories of college student retention tended to focus on the experiences of a small subset of students at particular types of institutions (Tierney 1992), subsequent scholarship covers an increasingly diverse array of student groups at a variety of institutional types. For example, research has been conducted with students at institutions of different types as well as selectivity (Braxton, *et al.* 2014, Hurtado, *et al.* 1999, Tinto 2012). Other scholars focus on student characteristics such as self-identification as African American (Strayhorn 2012), Hispanic (Hurtado and Carter 1997; Maestas, Vaquera,

and Zehr 2007), veteran (Southwell, *et al.* 2016), women (Allaf 2012, Henry 2012), and first generation (Allaire 2019; Mukherji, Neuwirth and Limonic 2017).

As a result, the underlying structure of the data audit should reflect scholarship that most directly informs the particular institution's student population and institutional type. This specific study draws strategically upon Braxton, *et al.*'s theory of student persistence at residential colleges and universities (2014) as his team's theory was empirically tested and validated for students at independent residential colleges and universities. The theoretical model is graphically displayed in Figure 1. See Braxton, *et al.* (2014) for a definition of the concepts of this model. Readers must have knowledge of the definition of these concepts to comprehend the application of the databases audit to Tulane University. If an institution selects a different theoretical model for use in its database audit, then readers should also acquire knowledge of the definition of the selected theory's concepts.

In narrative form, the theoretical model states that a variety of student entry characteristics impact students' initial goal and institutional commitments. Initial goal commitment, in turn, impacts social integration. At the same time, initial institutional commitment not only informs subsequent commitment but also students' perceptions of institutional commitment to the welfare of students, institutional integrity, and levels of psychosocial engagement. These last three factors, along with a student's ability to pay, directly inform social integration, which in turn directly informs subsequent institutional commitment and persistence. Braxton, *et al.* (2014) report that their finding of a positive association between social integration and subsequent institutional commitment adds to the reliability of this association given that sixteen of nineteen tests of this relationship at residential colleges and universities confirm this association (208). They also note the reliability of the relationship between subsequent institutional commitment and persistence given that their affirmation of this relationship joins the ranks of eleven of thirteen previous tests of it at residential colleges and universities (Braxton, *et al.* 2014, 208).

Braxton and Francis (2017) offer evidence of empirical associations between the concepts of institutional commitment to student welfare and institutional and social integration. Thus, the extent of empirical support for the various concepts of the selected theory reinforces its selection for illustration.

A key revision of Braxton, *et al.*'s (2014) theory is the articulation of the role of cultural capital as a student entry characteristic that impacts proactive social adjustment, communal potential, and psychosocial engagement. Overall, the revised model places heavy emphasis on the relationship between social integration and persistence.

Depending on institutional context, other options include the Braxton, *et al.* (2014) theory of student persistence at commuter colleges and universities or Hurtado and Ponjuan's (2005) work on factors impacting Latinx student outcomes at public, four-year institutions. Institutional variety abounds. Kerby (2015) aptly describes the landscape: "Retention issues in higher ed-

ucation are multifaceted, vary from institution to institution, and are continually in flux...administrators must create retention plans that are appropriate for their universities" (156). Indeed, theoretical specificity regarding institutional context is increasingly important in today's complex higher education environment.

Once an applicable theoretical frame is chosen, the final step in part I is to list all research referents associated with the theoretical frame. Research referents take the form of statistically significant concepts of the theoretical frame. This includes independent as well as dependent variables. Table 1 (on page 7) lists the research referents that will eventually be linked with Tulane University's institutional databases audit alongside the empirical relationships between and among research referents as reported by Braxton, *et al.* (2014) as results of their empirical test of the theory of student persistence at residential colleges and universities. Note that, at this stage, the emphasis is on listing all research referents, not on rank ordering them or even labeling them as independent or dependent variables.

Part II: Scaffolding

The second portion of the 3S methodology refers to scaffolding. This is the gathering of data sources that potentially correspond to the theoretical structure and associated research referents. The image of scaffolding (in the "construction" sense) is important, as it is both essential to the overall process of construction and yet also inherently temporal. In other words, the goal of part II is to provide opportunities for adding to the structure of the databases audit without committing wholeheartedly to those opportunities.

A review of internal surveys is typically the starting point for scaffolding. Internal surveys refer specifically to data gathered from students through the intentional outreach of campus partners. Available data will vary significantly by institution, based in part on which office is conducting the institutional databases audit and the nature of existing relationships between that office and other campus partners. The current study's research team was fortunate to maintain amicable and productive professional relationships with a variety of

TABLE 1 ► Research Referents from Braxton *et al.*'s (2014) Theory of Student Retention in Residential Colleges and Universities

Research Referent ¹	Empirical Relationships Between and Among Research Referents
Race	► Social Integration
Live on Campus	► Social Integration ► Student Persistence
Initial Institutional Commitment	► Subsequent Institutional Commitment ► Student Persistence
Institutional Commitment to Student Welfare	► Social Integration ► Subsequent Institutional Commitment
Institutional Integrity	► Social Integration
Psychosocial Engagement	► Social Integration
Social Integration	► Subsequent Institutional Commitment
Subsequent Institutional Commitment	► Student Persistence
Parental Income	► Psychosocial Engagement
High School Grades	► Psychosocial Engagement
Cultural Capital	► Psychosocial Engagement
Communal Potential	► Psychosocial Engagement
Identity: Residence Halls	► Psychosocial Engagement
Interaction: Residence Halls	► Psychosocial Engagement
Parental Education	► Institutional Commitment to Student Welfare
Fairness	► Institutional Commitment to Student Welfare
Racial Discrimination and Prejudice	► Institutional Commitment to Student Welfare ► Institutional Integrity
Faculty Interest in Students	► Institutional Commitment to Student Welfare ► Institutional Integrity
Good Faculty Teaching	► Institutional Commitment to Student Welfare
Faculty Violation of the Norm of Condescending Negativism	► Institutional Commitment to Student Welfare
Fulfillment of Expectations: Academic	► Institutional Integrity

¹ Referents listed will eventually be linked with Tulane University's institutional database audit alongside the empirical relationships between and among research referents as reported by Braxton *et al.* (2014) as results of their empirical test of the theory of student persistence in residential colleges and universities.

campus partners. The team reached out to contacts who hold leadership positions in the following arenas:

- Advising Center (offers career services, academic advising, and success coaching)
- First-Year Interdisciplinary Experience Seminar Program (required for all first-year students)
- Housing and Residence Life (for institutions where students reside on campus)
- Orientation Programs (includes new student orientation, transfer student orientation, fall welcome, and spring orientation)

A key recommendation is to partner with offices that interact with the largest swath of students. In general, every incoming full-time student at the researchers' institution will interact with at least two of the four partners noted above at least once during the first year of attendance. The list of internal surveys need not be exhaustive but should focus on ensuring that the most students are represented in the data sources.

Second, an evaluation of external surveys contributes meaningfully to the process of scaffolding. External surveys refer specifically to data gathered from students through existing professional relationships with partners outside of the university and/or from participation in surveys available through national organizations. Again, available data will vary significantly by institution. Tulane University participates in three national surveys that have proven invaluable in understanding its student population; administering organizations facilitate the dissemination, collection, and analysis of the survey data. The surveys include:

- Admitted Student Questionnaire (ASQ), administered by The College Board;
- CIRP Freshman Survey, administered by the Higher Education Research Institute at UCLA; and the
- National Survey of Student Engagement (NSSE), administered by the Center for Postsecondary Research in the Indiana University School of Education.

At least initially, less flexibility exists regarding the selection of external surveys, as institutions likely have preexisting relationships with various organizations. Nevertheless, external surveys offer a trove of data because many of them aggregate and compare findings across institutions. For example, institutions that participate in the CIRP Freshman Survey often receive annual findings that highlight the nuances of their specific student body and compare them to those of peer institutions that also partner with the Higher Education Research Institute at UCLA.

External partnerships are an important source of data and research. If no such partnerships exist, then choose strategic partnerships that allow institutions not only to outsource the research process but also to glean important comparative information from other institutions. Thus, a key recommendation of this phase is to think critically about which research organizations with which to partner; external partnerships will reap benefits (and perhaps some frustrations) on a longer term and a less flexible basis than campus partnerships focused on internal surveys.

Third, assessment of an institution's existing student database is integral to the process of scaffolding. This step seeks to answer the question "What student information is readily available?" The answer almost certainly includes basic demographic data yet also, depending on institutional policy and procedure, more creative datasets. For example, if an institution requires that professors submit midterm grades, then that information might inform an existing student database. Or, if an institution issues student identification cards that are used to swipe in to residence halls or other campus buildings such as the recreation center, then that time-stamped and location-based information might prove valuable. Generally speaking, this information exists in the most-navigated portions of each institution's system of record. The university registrar is an invaluable ally regarding information in the existing student database. The registrar's student information system regularly houses basic (and, at times, detailed) information about admissions, financial aid, meal plans, housing, grades, demographics, and more. Depending on the theoretical

model, data from the university's student information system may be some of the most valuable.

Part III: Synthesizing

The third step of the 3S methodology is *synthesizing*. The act of synthesizing centers on combing through scaffolding resources (part II) and matching their data elements with potential research referents from the structuring phase (part I). To begin, create a template that lists research referents in one column and specific data elements in another. Then, analyze the various scaffolding pieces systematically and individually to determine whether particular questions or constructs are applicable to research referents. This process should be validated and confirmed or challenged by a research partner in a sequential and iterative process. Table 2 (on page 10) depicts versions of a template that pairs specific data elements identified through scaffolding resources (part II) with research referents (part I).

The process is equal parts art and science for a few important reasons: One, the researcher is applying institutional knowledge to connect scaffolding with structure. This is certainly an art, and its utility should not be overlooked. Two, at the same time, the researcher is applying insights gleaned from scholarly literature. This is more scientific in nature and, again, its utility should not be overlooked. Indeed, the two lenses through which to view the synthesizing process are complementary. A key recommendation of this phase is to confirm that individual research partners complement one another or, better yet, that each is individually familiar with institutional knowledge as well as scholarly literature. Moreover, individual research partners should agree on the matching of specific data elements with the corresponding research referents. Of note, specific data elements selected to correspond with a given research referent may vary across the different data sources used by a college or university. However, the notion of the interchangeability of indicators obviates concerns over such intra-institutional variability. The notion of the interchangeability of indicators refers to the existence of different indicators that, to some extent, depict the same concept (Babbie 2001).

Methodology: Final Comments

At the risk of overemphasis, it is essential to engage at least two different research team members in the 3S methodology as a sequential iterative process. Doing so will not only provide important substance to institutional knowledge and sharpen the connection with scholarship, but it will also increase the potential for theoretical insights to inform unique campus contexts.

Results of the Audit

Completing the 3S methodology produces a variety of beneficial insights that, in turn, can guide further uses of and next steps regarding a data audit. In this way, this results section functions as a check-up on the metaphorical health of a university's databases. In other words, it is only by knowing the results that one can make informed decisions regarding how a data audit speaks to the specific needs of a university's context. This section presents the results of part III: synthesizing of the 3S methodology. Table 3 (on page 14) is a construction from the results of Tables 1 and 2. These results are presented with an acknowledgment that the specific data elements from external surveys, internal surveys, and the existing university databases pertain to Tulane University and may differ from the data elements at other colleges and universities.

Table 3 outlines the overall results and answers the question "What percentage of research referents are found in specific surveys and databases, and what percentage of surveys and databases address specific research referents?" The results are overwhelmingly positive: 100 percent of the research referents are accounted for in at least one of the eight surveys and databases. The range extends from a low of 19.05 percent of research referents (four of 21) corresponding to data elements in the ASQ to a high of 47.62 percent of research referents (ten of 21) corresponding to data elements in the NSSE.

Conversely, each research referent is found in at least one survey or database. Four research referents are found in only one survey or database: "institutional commitment to student welfare" stems from data elements in an orientation survey; "institutional integrity"

TABLE 2 ► Template for Part III: Synthesizing Pairing of Data Elements with Research Referents

Research Referent	Scaffolding ¹
Data Elements from External Surveys	
Race	► Self-reported race/ethnic background (ASQ) ► Race/Ethnicity—Mark all that apply (total may add to more than 100%) (CIRP) ► What is your racial or ethnic identification? (Select all that apply) (NSSE)
Live on Campus	► About how many hours do you spend in a typical 7-day week commuting to campus (driving, walking, etc.)? (NSSE)
Initial Institutional Commitment	► What percentage of students listed our college among their top three choices? As first choice? (ASQ) ► Is this college your first choice? Second choice? Third choice? Less than third choice? (CIRP)
Institutional Commitment to Student Welfare	—
Institutional Integrity	—
Psychosocial Engagement	► What is your best guess as to the chances that you will join a social fraternity or sorority? (CIRP)
Social Integration	—
Subsequent Institutional Commitment	► If you could start over again, would you go to the same institution you are now attending? (NSSE)
Parental Income	► Self-reported parents' income (ASQ) ► What is your best estimate of your parents'/guardians' total income last year? (CIRP)
High School Grades	► Self-reported average grades (ASQ) ► What was your average grade in high school? (CIRP)
Cultural Capital	► In the past year, how often have you performed volunteer work? (CIRP) ► During the current school year, about how often have you attended an art exhibit, play, or other arts performance (dance, music, etc.)? (NSSE)
Communal Potential	► How important was each reason in your decision to come here? This college has a good reputation for its social and extracurricular activities (CIRP)
Identity: Residence Halls	—
Interaction: Residence Halls	—
Parental Education	► What is the highest level of education completed by either of your parents (or those who raised you)? (NSSE)
Fairness	—
Racial Discrimination and Prejudice	► Racial discrimination is no longer a major problem in America. (Likert scale) (CIRP) ► During the current school year, about how often have you had discussions with people of a race or ethnicity other than your own? (NSSE)

¹ Example questions presented are illustrative of at least one data element in each specific survey/database that relates to a corresponding research referent and are not exhaustive.

TABLE 2 ► Template for Part III: Synthesizing Pairing of Data Elements with Research Referents

Research Referent	Scaffolding ¹
Faculty Interest in Students	► How often was contact with faculty used as a source of information by enrolling and non-enrolling students? (ASQ) ► During the current school year, about how often have you sought help with coursework from faculty members? (NSSE)
Good Faculty Teaching	► During the current school year, to what extent have your instructors don't the following? (NSSE) › Clearly explained course goals and requirements › Taught course sessions in an organized way › Used examples or illustrations to explain difficult points › Provided feedback
Faculty Violation of the Norm of Condescending Negativism	► Indicate the quality of your interactions with the faculty at your institution. (NSSE)
Fulfillment of Expectations: Academic	► How much does your institution emphasize spending significant time studying and on academic work? (NSSE)
Data Elements from Internal Surveys	
Race	► What is your race? Choose all that apply. (Housing)
Live on campus	► Please select your residence hall from the following options. (Housing) ► In what residence hall do you live? (Orientation)
Initial Institutional Commitment	► What is your best guess as to the chances that you will transfer to another college before graduating? (First-Year Seminar, beginning of semester)
Institutional Commitment to Student Welfare	► To what extent did New Student Orientation increase your knowledge of the values of the Tulane University community? (Orientation)
Institutional Integrity	► Reasons for transfer: Campus environment/fit (Academic Advising)
Psychosocial Engagement	► To what extent has living in on-campus housing enhanced your ability to meet other students? Interact with residents who are different from you? (Housing) ► To what extent did New Student Orientation help you interact with other new students? (Orientation) ► What is your best guess as to the chances that you will participate in student clubs/groups? (First-Year Seminar)
Social Integration	► In your living area, to what degree do you feel accepted by other students? (Housing) ► To what extent did New Student Orientation (NSO) help you discover opportunities for involvement on campus? (Orientation)
Subsequent Institutional Commitment	► Regarding your on-campus housing experiences, to what degree has it positively impacted your decision to return to this college/university next year? (Housing) ► What is your best guess as to the chances that you will transfer to another college before graduating? (First-Year Seminar, end of semester)
Parental Income	—

¹ Example questions presented are illustrative of at least one data element in each specific survey/database that relates to a corresponding research referent and are not exhaustive.

TABLE 2 ► Template for Part III: Synthesizing Pairing of Data Elements with Research Referents

Research Referent	Scaffolding ¹
High School Grades	► Please list any AP or IB credit received during high school as well as any courses taken for college credit. (Academic Advising)
Cultural Capital	—
Communal Potential	► In your living area, to what degree do you trust other students? Respect other students? (Housing) ► As a result of attending New Student Orientation, I feel a stronger connection to my classmates. (Orientation) ► My peer mentor helped me to find my people and/or place on campus. (First-Year Seminar)
Identity: Residence Halls	► Regarding your original room assignment/allocation, how satisfied were you with your residence hall/building? (Housing)
Interaction: Residence Halls	► How often do you participate in programs/activities sponsored by your hall or apartment complex? (Housing) ► To what extent did your first floor meeting provide you with an opportunity to have a meaningful interaction with a student leader or peer mentor? (Orientation)
Parental Education	
Fairness	► How satisfied are you with your Resident Advisor on your floor regarding treating everyone fairly? (Housing)
Racial Discrimination and Prejudice	
Faculty Interest in Students	► Reasons for transfer: Lack of faculty engagement (Academic Advising) ► To what extent did the activities below provide you with an opportunity to have a meaningful interaction with a Tulane faculty member? (Orientation) ► My faculty member is someone who cares about me as a person. (First-Year Seminar)
Good Faculty Teaching	► Have you gained a good understanding of this subject matter? (First-Year Seminar)
Faculty Violation of the Norm of Condescending Negativism	► Does the instructor treat all students with respect? (First-Year Seminar)
Fulfillment of Expectations: Academic	► Reasons for transfer: Academic rigor lower/higher than expected (Academic Advising)
Data Elements from Existing University Database	
Race	► Registrar database
Live on campus	► Registrar database
Initial Institutional Commitment	—
Institutional Commitment to Student Welfare	—
Institutional Integrity	—
Psychosocial Engagement	—
Social Integration	—

¹ Example questions presented are illustrative of at least one data element in each specific survey/database that relates to a corresponding research referent and are not exhaustive.

TABLE 2 ► Template for Part III: Synthesizing Pairing of Data Elements with Research Referents

Research Referent	Scaffolding ¹
Subsequent Institutional Commitment	—
Parental Income	► Admissions database
High School Grades	► Admissions database
Cultural Capital	—
Communal Potential	—
Identity: Residence Halls	—
Interaction: Residence Halls	—
Parental Education	► Admissions database
Fairness	—
Racial Discrimination and Prejudice	—
Faculty Interest in Students	► Semesterly course evaluations
Good Faculty Teaching	► Semesterly course evaluations
Faculty Violation of the Norm of Condescending Negativism	► Semesterly course evaluations
Fulfillment of Expectations: Academic	—

¹ Example questions presented are illustrative of at least one data element in each specific survey/ database that relates to a corresponding research referent and are not exhaustive.

stems from data elements in academic advising; and “identity: residence halls” and “fairness” stem from data elements in housing. Two research referents appear five or more times across the eight surveys or database: “race” appears in the ASQ, CIRP, NSSE, housing, and the existing university database. “Faculty interest in students” appears in the ASQ, NSSE, academic advising, orientation, first-year seminar surveys, and course evaluations in the existing university database.

Table 4 presents the relationship between external surveys and research referents. A total of six research referents are not accounted for in any of the three external surveys: “institutional commitment to student welfare,” “institutional integrity,” “social integration,” “identity: residence halls,” “interaction: residence halls,” and “fairness.” In addition, only one research referent, “race,” is accounted for in all three external surveys.

Table 5 offers a closer look at the relationship between internal surveys and research referents. Of note, three research referents — “parental income,” “parental education,” and “racial discrimination and prejudice” — are not accounted for in any of the four internal surveys. Likewise, though no research referent is found in all four internal surveys, three appear in three internal surveys: “psychosocial engagement” (housing, orientation, first-year seminar); “communal potential” (housing, orientation, first-year seminar); and “faculty interest in students” (academic advising, orientation, first-year seminar).

Of particular note is the relative lack of survey data about the student experience that come from academic advising, even though that department interacts with a high percentage of the undergraduate student body. The information gleaned from their survey data stem

TABLE 3 ► Results Showing Percentage of Research Referents within Surveys/Databases and Percentage of Surveys/Databases that Address Research Referents

Research Referent	ASQ	CIRP	NSSE	Academic Advising	Housing	Orientation	First-Year Seminar	Existing University Database	% of Surveys / Databases that Address Research Referent
Race	✓	✓	✓		✓			✓	62.50
Live on campus			✓		✓	✓		✓	50.00
Initial Institutional Commitment	✓	✓					✓		37.50
Institutional Commitment to Student Welfare						✓			12.50
Institutional Integrity				✓					12.50
Psychosocial Engagement		✓			✓	✓	✓		50.00
Social Integration					✓	✓			25.00
Subsequent Institutional Commitment			✓		✓		✓		37.50
Parental Income	✓	✓						✓	37.50
High School Grades	✓	✓		✓				✓	50.00
Cultural Capital		✓	✓						25.00
Communal Potential		✓			✓	✓	✓		50.00
Identity: Residence Halls					✓				12.50
Interaction: Residence Halls					✓	✓			25.00
Parental Education			✓					✓	25.00
Fairness					✓				12.50
Racial Discrimination and Prejudice		✓	✓						25.00
Faculty Interest in Students	✓		✓	✓		✓	✓	✓	75.00
Good Faculty Teaching			✓				✓	✓	37.50
Faculty Violation of the Norm of Condescending Negativism			✓				✓	✓	37.50
Fulfillment of Expectations: Academic			✓	✓					25.00
% of Research Referents within Survey/Database	23.81	38.10	47.62	19.05	42.86	33.33	33.33	38.10	

predominantly from an exit interview conducted with students who are leaving the institution for issues unrelated to graduation (including transfer, medical withdrawal, etc.) and the “hopes and dreams” survey that gauges academic and career interests upon entrance. Given this specific subsample and the high probability of bias with the exit survey, along with somewhat low response rates to the hopes and dreams survey, the research team proceeds with caution when using academic advising surveys. This is a prime example of the importance of approaching the 3S methodology in an

iterative manner: Academic advising survey data will almost certainly be dropped from subsequent analysis that seeks to uncover research referents as they manifest in data elements across the student body. At the same time, it is important to know that these specific data exist because they might be helpful for subsequent research on students who are leaving the institution.

Table 6 offers a closer look at the relationship between the existing university database and research referents. Note that 38.10 percent of research referents (eight of 21) are found in the existing university da-

TABLE 4 ► Results Highlighting Relationship between External Surveys and Research Referents

Research Referent	External Surveys			% of External Surveys that Address Research Referent
	ASQ	CIRP	NSSE	
Race	✓	✓	✓	100.00
Live on campus			✓	33.33
Initial Institutional Commitment	✓	✓		66.67
Institutional Commitment to Student Welfare				0.00
Institutional Integrity				0.00
Psychosocial Engagement		✓		33.33
Social Integration				0.00
Subsequent Institutional Commitment			✓	33.33
Parental Income	✓	✓		66.67
High School Grades	✓	✓		66.67
Cultural Capital		✓	✓	66.67
Communal Potential		✓		33.33
Identity: Residence Halls				0.00
Interaction: Residence Halls				0.00
Parental Education			✓	33.33
Fairness				0.00
Racial Discrimination and Prejudice		✓	✓	66.67
Faculty Interest in Students	✓		✓	66.67
Good Faculty Teaching			✓	33.33
Faculty Violation of the Norm of Condescending Negativism			✓	33.33
Fulfillment of Expectations: Academic			✓	33.33
% of Research Referents within External Surveys	23.81	38.10	47.62	

tabase. (The institution is in the process of creating a campus-wide data warehouse.) The expectation is that the percentage of research referents will increase in subsequent iterations of the 3S methodology. Current data denote students' entry characteristics, such as demographics and high school grades, as well as key higher education experiences related to residence halls and faculty teaching.

Overall, the results indicate that performing an institutional databases audit to improve college student persistence is a fruitful endeavor. Unique and compelling datasets exist across every university; if they are analyzed iteratively and sequentially, then they might be linked in order to test theoretical concepts in a robust and multifaceted manner.

Uses of the Results of an Audit

This section presents the utility of an institutional databases audit through three distinct frames: (1) general uses and recommendations, (2) case study: application at a research-intensive university, and (3) subsequent uses. Each, in turn, highlights key insights regarding the results of an audit.

General Uses and Recommendations

The process of conducting an institutional databases audit is rewarding in its own right as it reveals a number of areas for growth. First, in the same way that the 3S methodology is ideally performed as an iterative process by two research team members, future teams should comprise researchers from various campus offices and departments and could include faculty as well

TABLE 5 ► Results Highlighting Relationship between Internal Surveys and Research Referents

Research Referent	Internal Surveys				% of Surveys / Databases that Address Research Referent
	Academic Advising	Housing	Orientation	First-Year Seminar	
Race		✓			25.00
Live on campus		✓	✓		50.00
Initial Institutional Commitment				✓	25.00
Institutional Commitment to Student Welfare			✓		25.00
Institutional Integrity	✓				25.00
Psychosocial Engagement		✓	✓	✓	75.00
Social Integration		✓	✓		50.00
Subsequent Institutional Commitment		✓		✓	50.00
Parental Income					0.00
High School Grades	✓				25.00
Cultural Capital					0.00
Communal Potential		✓	✓	✓	75.00
Identity: Residence Halls		✓			25.00
Interaction: Residence Halls		✓	✓		50.00
Parental Education					0.00
Fairness		✓			25.00
Racial Discrimination and Prejudice					0.00
Faculty Interest in Students	✓		✓	✓	75.00
Good Faculty Teaching				✓	25.00
Faculty Violation of the Norm of Condescending Negativism				✓	25.00
Fulfillment of Expectations: Academic	✓				25.00
% of Research Referents within Internal Surveys	19.05	42.86	33.33	33.33	

as administrators. The choice of team members is certainly strategic, as the champion and manager of the institutional databases audit should be familiar with a wide variety of campus partners and should also have a strong interest in research. As research team members from various offices bring their expertise on their own surveys and databases, research referents will be more deeply informed by data elements.

Second, these multiple expert perspectives can continually guide the modification of student databases as well as surveys that pertain to student retention. For example, our institution's Academic Advising Center lacks a depth of survey data even though it routinely interacts with students. Incorporating insights from a research team member from that office might reveal

previously unknown data from a relatively large portion of the undergraduate population. Those data could directly inform modifications to existing student databases and surveys.

Third, copies of all external and internal surveys should be kept in one location for easy reference. Even though researchers may benefit from amicable professional relationships and institutional support, it nonetheless requires significant effort to locate existing surveys and articulate the project parameters to stakeholders. Compiling an archive of surveys is a foundational step in the process of linking survey data.

The *results* of the institutional databases audit highlight two key recommendations: First, it is a recommended best practice that each research referent be

found in at least two surveys or databases, and it is ideal if those surveys or databases be of different kinds (*e.g.*, one external, one internal). This enhances data validity that otherwise might be compromised in the process of merging datasets.

The second key recommendation is a synthesis and re-articulation of the first: Whereas the process of performing an institutional databases audit might reveal existing data across the institution, the results showcase gaps in the data. Identification of these gaps can guide the development of new student databases and surveys pertaining to student retention. In fact, this general recommendation manifests in the specific case study described below.

Case Study: Application at a Research-Intensive University

Tulane University is presented as a case study to illustrate both how general uses and recommendations might be deployed in a specific context and also how subsequent uses may develop. The immediate uses of the audit at Tulane University included identifying gaps in available data, triangulating common data inquiries and responses across available survey instruments to bolster data-driven decisions, and, finally, eliminating redundancy of the instruments to prevent survey fatigue among students.

As Tulane University ramped up its retention initiatives, gathering data on current students and past cohorts was critical in obtaining a clear profile of attrition patterns and attributes connected to persistence. Early examination of available data yielded some patterns that Tulane University had previously overlooked, but a closer look at data that helped surface behavioral characteristics (such as participation in organizations and campus living habits) was needed to ground the preliminary observations. The data audit helped in two ways: (1) it clearly identified gaps in data that could provide this deeper examination, and (2) it helped identify some data that could illuminate key factors in retention that we had not thought were available. One example was the factor of communal engagement and the CIRP survey question about a student's intent to join a so-

TABLE 6 ► Results Highlighting Relationship between Existing University Database and Research Referents

Research Referent	Existing University Database
Race	✓
Live on campus	✓
Initial Institutional Commitment	
Institutional Commitment to Student Welfare	
Institutional Integrity	
Psychosocial Engagement	
Social Integration	
Subsequent Institutional Commitment	
Parental Income	✓
High School Grades	✓
Cultural Capital	
Communal Potential	
Identity: Residence Halls	
Interaction: Residence Halls	
Parental Education	✓
Fairness	
Racial Discrimination and Prejudice	
Faculty Interest in Students	✓
Good Faculty Teaching	✓
Faculty Violation of the Norm of Condescending Negativism	✓
Fulfillment of Expectations: Academic	
% of Research Referents within Existing University Database	38.10

ority or fraternity. This response had previously been regarded as a measure of a tendency toward a more social environment rather than a clear sign of communal engagement, which can support retention.

The second use of the data audit is the triangulation of data points from various instruments to support data-driven decisions and initiatives. Researchers at the university had previously used available data discretely; the audit surfaced common topics and responses that, combined, provided a thematic consensus that helped inform new initiatives and programs. For example, “faculty interest in students” as a contributor to retention was an area that Tulane University identified anecdot-

ally as “in need of improvement.” The audit revealed that questions on the CIRP, NSSE, and ASQ invited students to indicate their expectations of interactions with faculty that mapped back to institutional communication during the recruitment process, the post-deposit period, and orientation. Examining answers to these questions together helped drive an initiative to reframe these critical communication opportunities.

The third use of the audit was to reduce survey fatigue among students and eliminate survey redundancy. Tulane has struggled with this. As at a multitude of institutions, data remain siloed, and campus departments fight to retain control of the data they collect. Nevertheless, the audit can provide unequivocal evidence that as an organization with common goals for student success, we already have valuable data that are ready to be shared and optimized. Convincing data stewards of the value that can come from streamlined data collection is contingent on the trust that data will be readily available. As an institution, Tulane is still addressing this challenge.

Subsequent Uses

Subsequent uses of an institutional databases audit will be unique to individual campus contexts. They are likely to focus on three key areas. The first may be reports to key stakeholders invested in student success. Many of these reports already exist and are managed by a retention specialist; the reports include the multitude of factors—known and unknown—that affect retention rates. Insights regarding student persistence will become much more sophisticated as these factors, which existed previously in siloed databases, are combined into useful datasets.

The audit can inspire further enhancements to datasets and subsequent reports by identifying theoretical concepts not represented in current databases. Custom survey questions can be developed for internal and/or external surveys that will enhance the theoretical knowledge base about an institution’s student profile. For example, the CIRP survey permits institutions to develop custom questions for their surveys. The audit has helped identify gaps in data that can be filled by

implementing custom questions. Redundant questions can be eliminated from internal surveys in order to lessen survey time and, thereby, survey fatigue. Certain questions should be included in all surveys in a uniform format in order to gather more complete data (*e.g.*, first-generation status) about the student body. Last, some surveys collect unique identifiers (*e.g.*, student ID numbers) whereas some do not. Those that do not are useful for aggregate and trend reporting, but they are not useful in a larger database because the data cannot be linked to individual students.

Along with enhancing reports and databases, the audit can result in a base for an institutional data dictionary. It is imperative that all data users share a common vocabulary and definitions for all data points; otherwise, the reports and the interpretation of the data may be inaccurate or may differ across documents, increasing distrust of the data and of the people connected to the data. A databases audit will provide a starting point for gathering information about processes and activities within various units, and it can be applied further to see which units impact research referents.

The second area will focus on a system of alerts for students at risk of departure. At a fundamental level, a system of alerts for at-risk students is insufficient if key student groups are missing from the institutional databases audit as a result of non-participation in surveys. Thus, a preliminary step in creating a system of alerts is to assess survey response rates of student groups of institutional interest—for example, student athletes and first-generation students, among others. This information likely will inform strategic retention initiatives.

Once a university-specific databases audit is complete, statistically significant indicators of departure will become evident that are unique to individual campus contexts. This information can be shared with campus partners who manage teams that monitor and address the needs of at-risk students. For example, a retention support team was formed comprising representatives from student-facing units across campus. The audit has uncovered additional resources and information for the team to use to improve timely and individualized intervention. In addition, the audit has better connected

staff who input and use student data, improving buy-in to data-sharing practices and lessening ownership issues with some offices. A database audit will also help inform the timeline of data inputs and/or peak times of struggle for students. This can inform development of a retention calendar that helps manage the timely collection of data.

The third area may focus on monitoring the efficacy of retention efforts based on research findings that function as referents for database elements. In other words, the process and results of an institutional databases audit might inform a larger audit of a university's overall retention efforts. Such an effort would inform the strategic allocation of resources of time, money, and personnel. As data users and managers begin to share a common

data language and develop a better understanding of their data, it will be easier to align goals for student persistence within and across units. This also allows for the monitoring of institutional conditions delineated by research referents. For example, an institutional databases audit might reveal an overall hostile campus climate. Given this information, university officials might sponsor strategic initiatives to further monitor institutional conditions and enact institution-wide change.

Indeed, subsequent uses of an institutional databases audit seem to be limited only by the imagination. Provided that subsequent key focus areas incorporate the present article's recommendations, an institutional databases audit will provide a framework for fostering a university's successful retention efforts.

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