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Good Leavers and Bad Stayers: Exploring the Influence of Defining Student Success Outcomes with a Composite Measure of Performance and Persistence

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GOOD LEAVERS AND BAD STAYERS:
EXPLORING THE INFLUENCE OF DEFINING STUDENT SUCCESS OUTCOMES
WITH A COMPOSITE MEASURE OF PERFORMANCE AND PERSISTENCE

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DISSERTATION

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A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Education
at the University of Kentucky

By
Curtis Theodore Sandberg

Lexington, KY

Director: Dr. Kelly Bradley, Professor of Education

Lexington, Kentucky

2015

ABSTRACT OF DISSERTATION

GOOD LEAVERS AND BAD STAYERS:
EXPLORING THE INFLUENCE OF DEFINING STUDENT SUCCESS OUTCOMES
WITH A COMPOSITE MEASURE OF PERFORMANCE AND PERSISTENCE

Not all college "stayers" and "leavers" stay or leave for the same reason or with the same experience. However, traditional measures and studies of academic success have limited their scope to either performance or persistence as individual variables. This study explored whether a more nuanced definition of success as a composite of both performance and persistence (GPA and retention) produced different results than when using the variables separately. The influence of academic self-efficacy on student success served as the context for this exploration. The study used an existing incoming student survey dataset from a small private liberal arts college. Subjects were grouped into one of five categories based on academic performance and persistence after two terms: Good Performing Leavers, Good Performing Stayers, Bad Performing Leavers, Bad Performing Stayers, and Early Leavers. The relationship between academic self-efficacy and student success, using the individual and composite outcome variables, were explored. The results of the study were inconclusive with the composite measure resulting in only a slight increase in the number of significant relationship with self-efficacy items. Post hoc exploratory analysis that controlled for high school GPA and removed subjects who did not appear to have engaged in the survey resulted in some support for the original hypothesis. These and other suggestions are made for future investigations of this question.

KEYWORDS: Academic Self-Efficacy, Performance, Persistence, Higher Education, Outcomes

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11-18-2015
Date

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WITH A COMPOSITE MEASURE OF PERFORMANCE AND PERSISTENCE

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For Tamara, Claire, and Elliot

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I remember the day that Dr. Pasewark handed me back a red ink covered paper that I had written for him as part of my work-study position as a struggling undergraduate. He told me that I could do better and I believed him. Thank you for seeing in me what I was beginning to doubt. I had the great fortune of being able to study statistics under Steve Bieber. The notes and assignments from his courses are the only ones that I have kept and still use after more than 20 years. I appreciate his willingness over the years, particularly as I finished this dissertation in the last several months, to answer my questions and help me remember what I had previously learned. The one lesson that I have tried never to forget was when he told me that he always wanted to be teachable. I have also learned a lot from Fuji Adachi as my boss, mentor, and friend. While my desk is still a mess, much to Fuji's consternation, I did learn from his logical and strategic approach to problems, which only is matched by his commitment to helping others.

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Introduction

Research on student success in higher education is faced with two parallel

challenges. First, some students who we anticipate will be successful are not, and some

who we do not predict will be successful are. Second, not all students who are

performing adequately continue their enrollment. Most typical research on college

student success defines success in terms of retention/attrition (Persistence) or in terms of

grade point average (Performance). While some might include both outcome measures

in a study, they usually have been studied separately as two distinct dependent

variables. This study explores how defining academic performance and persistence as

two separate outcome variables versus together in one composite variable influences

their relationship with academic self-efficacy. Academic self-efficacy is defined as an

individual's belief that he or she can accomplish specific tasks related to successful

completion of a college degree.

Persistence is typically treated as a dichotomous variable; i.e., a student has

either stayed or left the college or university. However, this simplification may not

accurately portray the actual student experience. The quality, characteristics, or

description of whether and how a student leaves or stays at the institution are much

richer. While retention might not be a nominal variable, we can certainly create multiple

categories to represent partially its multifaceted nature and to account for some of the

variations of student experience.

Not all "stayers" are the same, nor do all "leavers" leave with the same experience or for the same reasons. Some students stay and struggle but demonstrate Persistence. Some students who are doing well academically leave to pursue other options because of institutional fit or other non-cognitive issues. While these observations may be intuitive, little student retention research to date accounts for these different types of outcomes.

Academic factors such as high school grade point average and standardized test scores only go so far in predicting student success in college. Some highly prepared students leave and some less prepared students stay. Standardized scores are primarily reflections of ability and preparation. High school GPA reflects a combination of ability and past behaviors. The concept of non-cognitive factors recognizes that academic success relies on more than aptitude or intellect.

Non-cognitive factors are those attributes that influence an individual's ability to reach their potential or to demonstrate their abilities. These factors include motivation, grit, resilience, and self-efficacy. They presumably account for the "other" things beyond current or previous grades or standardized tests in predicting retention.

Non-cognitive factors have strong theoretical backing for their relationship with academic success and have been shown to be related to retention and academic performance (Lotkowski, Robbins, & Noeth, 2004; Sedlacek, 2004a). Given that most previous studies typically have looked at the relationship between non-cognitive factors and retention or Performance separately, the actual influence of non-cognitive factors

may have been obscured by grouping all leavers, stayers, performers, and/or strugglers together (Knoell, 1960).

The basis for argument of this current study is the following: if, theoretically, non-cognitive factors tell another part of the story of student success, then the outcomes must be measured in a way that also reflects more of the story. Furthermore, because we are looking at factors that tell more of the story, we can expect them to help us to differentiate among distinct populations of students. If we look at Performance or retention alone, then each can mask the true story and the variance in dissimilar populations in relation to each of these concepts. This study will explore how defining student success outcomes in a more precise manner (using retention and Performance together in a composite variable) influences the ability of self-efficacy, one of many non-cognitive variables, to demonstrate a relationship with student success.

Self-Efficacy

Self-efficacy is defined as the belief in one's ability to complete successfully a specific task (Bandura, 1977). It is 1 of several non-cognitive variables that have seen an increase in use in research and practice related to student retention and academic success (Robbins et al., 2004). While generalized self-efficacy is important, it is not as predictive of specific actions. Self-efficacy is best used in a domain-specific manner (Bandura, 2006). Therefore, rather than asking students if they believe that they will be successful in college or in general, attempts are made in this current study to determine the students' self-efficacy related to specific tasks related to successful continuation and completion of a higher education degree.

Traditional academic readiness factors, such as high school GPA and standardized test scores, are not perfectly predictive. There are always students who defy the odds and are more or less successful than these previous achievement factors would suggest.

While academic achievement factors like high school GPA, high school class rank, and standardized test scores typically account for the majority of variance related to academic performance and persistence literature (Lotkowski et al., 2004), these measures have limited ability to provide adequate specific information to develop or target services to meet the needs of the students. As measures of previous academic performance, GPA, class rank, and standardized test scores are good predictors of future Performance. However, these variables do not provide information about the reasons for this Performance and how it can be improved. These academic readiness measures are symptoms, not causes, of previous behavior and their utility is best suited for admissions decisions rather than support and intervention planning.

There is recognition in higher education that non-cognitive factors can supplement and/or support the predictive value of traditional factors of academic preparation, such as ACT/SAT score and high school GPA (Lotkowski et al., 2004). Self-efficacy and other non-cognitive factors have been used in the college admissions process to go beyond academic factors to identify those who will be most likely to succeed academically (Sedlacek, 2004a).

Performance and Persistence and Performance/Persistence

In higher education assessment and research, retention is a ubiquitous measure of student and institutional success. The timeliness of retention rates, as compared to graduation rates, make them more suited to research and assessment research, since they can be measured on an annual basis rather than after four, five, or six years. Retention also provides information about the timing of student leaving, which can then be used to develop targeted interventions and to understand better why students are leaving.

Retention is used as an outcome/dependent variable in research to see what variables are related to student success (retention). Additionally, retention, as a dichotomous variable, is relatively simple to measure: is the student enrolled or not?

There are arguments that retention, and even graduation, are secondary to student learning as the most important outcome of college. However, student learning outcomes are differently defined between institutions and often difficult to measure at the intra- and inter-institutional levels. The best, though imperfect, proxy of student learning is grade point average. However, like retention, the use of GPA is not without its weaknesses. Grade inflation and the lack of standardization and validity measures create additional research challenges.

Literature on both Persistence and Performance are staples of academic journals. However, literature that brings these measures together as a composite outcome is lacking. While there are studies that explore the *relationship* between Performance and Persistence and find that the lower the Performance, the less likely the student is to

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continue, the effect of bringing the two variables together as one combined outcome has not been fully explored.

If we believe, as research seems to support, that academic success is influenced simultaneously by both cognitive factors (academic ability) and non-cognitive factors (the context for the application of this ability), the definition of academic success must also be similarly nuanced. Academic success cannot be neatly defined and measured by either leaving or staying or solely by Performance measures of grades and GPAs.

A neglected area of research is how defining outcome measures for student success in a more nuanced way influences the predictability of non-cognitive measures. Is the relationship between student success and academic self-efficacy different when student success is defined by academic performance and persistence together versus by them separately? Does altering the definition of student success as an outcome measures change how independent variables act?

If we follow the argument that non-cognitive factors are separate and independent concepts from cognitive abilities, then we would expect that they would potentially relate differently to both Performance and Persistence. Furthermore, they might be predictive of different types of Persistence when taking into account student Performance.

Additionally, we can expect that the strongest relationships would come from combining Performance and Persistence as different categories of outcomes. The simplest method, as illustrated in Figure 1, would be to dichotomize Performance as good or bad, which would result in Good Stayers, Bad Stayers, Good Leavers, and Bad

Leavers. This definition of student success makes use of data that is readily available at all institutions of higher education. The composite variables are easily created without being unnecessarily complex.

Figure 1: Performance and Persistence Combined Outcomes

```
                                                    ┌──────────────┐
                                                    │     Good     │
                                    ┌──────────┐    │  Performing  │
                                    │  Stayers │    └──────────────┘
                                    └──────────┘    ┌──────────────┐
                                                    │     Bad      │
                 ┌──────────┐                       │  Performing  │
                 │ Incoming │                       └──────────────┘
                 │ Students │                       ┌──────────────┐
                 └──────────┘                       │     Good     │
                                                    │  Performing  │
                                                    └──────────────┘
                                    ┌──────────┐    ┌──────────────┐
                                    │  Leavers │    │     Bad      │
                                    └──────────┘    │  Performing  │
                                                    └──────────────┘
                                                    ┌──────────────┐
                                                    │    Early     │
                                                    │   Leavers    │
                                                    └──────────────┘
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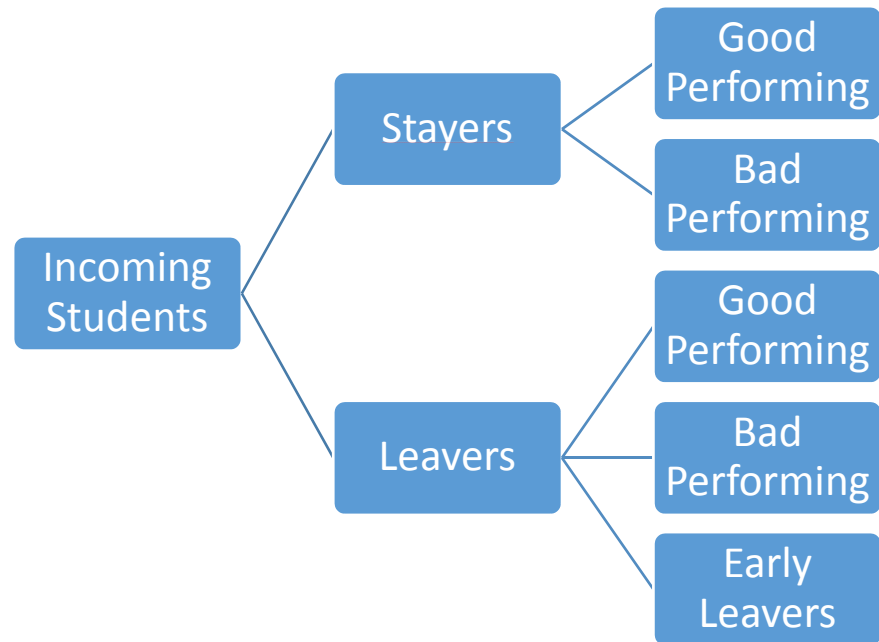
The experience of students who leave college with a high GPA is different from those who stay in school with a low GPA, which is in turn different from those who leave in their first term before their have completed a single course. If these populations are different, then they should not be treated as the same by combining all students who leave and stay together in two separate groups. Neither should Performance be treated in this way.

Study Purpose

The purpose of this study was to investigate how combining measures of Performance and Persistence (GPA and retention) into a composite variable changes the relationships of measures of academic self-efficacy versus looking at retention and GPA as separate outcome measures. This study was designed to determine whether this more nuanced definition of student success results in similar or different relationships between the Academic Self-efficacy measures.

Bringing retention and Performance status together into one composite variable recognizes that retention alone is not adequate to represent the variety of students who either stay or leave. Simply put, all "stayers" and "leavers" do not stay or leave for the same reasons or with the same experience. Thinking of retention and Performance separately is an over-simplification of the data and the actual student experience.

While academic readiness factors like high school GPA, high school class rank, and standardized test scores typically account for the majority of variance related to academic performance and persistence literature (Lotkowski et al., 2004), these measures have limited ability to provide adequate information about why a student's outcome may be unexpected. Measures of previous academic performance are good predictors of future Performance, but they do not provide us with information about the reasons for this Performance and how it can be improved. This study will explore self-efficacy and how it reflects the complexity of the student experience in relationship to retention and Persistence, together and separately. This will help us to understand why good students leave and struggling students stay.

Research Questions

The current study focused on whether Academic Self-efficacy and Academic

Readiness factors relate differently to Performance and Persistence, both when they are

combined into one composite variable, and when they are considered separately. Based

on data from a pilot study, it was hypothesized that more self-efficacy items will be

related to these outcome variables as a composite variable than when Performance and

Persistence are kept separate. It was hypothesized that more Academic Self-efficacy

items will be related to Performance and Persistence as composite outcome variables

than when they are measured separately.

The current study explored the following question: Does the operationalization

of academic success using Performance and Persistence together--as opposed to using

Performance and Persistence separately--change the results when measuring its

relationship with Academic Readiness factors and measures of Academic Self-efficacy?

To answer these questions, data from a survey given to incoming students at

Berea College, a small selective private liberal arts college in Kentucky, were analyzed.

Berea College is specifically identified, with the permission of the institution, in order to

provide a context for the study because of its distinctive mission and practices of only

admitting students with limited financial means and providing all students with a full

tuition scholarship. Given that all subjects are low-income, the reader should be mindful

of how this might influence the generalizability of the data. Additionally, some of the

self-efficacy items in the student survey are specific to Berea College's labor program, in

which all students are required to work at least 10 hours per week in an on-campus job.

For this study, a survey was used that was developed by personnel at Berea College to measure non-cognitive skills following students' acceptance into the institution but prior to their arrival on campus. It includes 24 items related to Academic Self-efficacy. This timing of survey administration was selected to reduce the desirability bias of the responses. While it is beyond the scope of the current work, future studies may investigate whether this timing influences responses. The survey was embedded as part of incoming students' on-line orientation. A total of 1,070 students took the survey in the three years used in this study, which equates to a 98.7 percent overall response rate.

Students were separated into five categories based on their enrollment in the fall of their 2nd year following their initial enrollment, the date of withdrawal, if applicable, and their cumulative GPA, as specified in Table 1 below.

Table 1

Composite Variable Group Definitions based on Retention and Performance

Category	Definition
Good Performing Stayers (GPS)	Retained to second fall with cumulative GPA equal to or greater than 2.25
Bad Performing Stayers (BPS)	Retained to second fall with a cumulative GPA less than 2.25
Good Performing Leavers (GPL)	Left after first term but before second fall term with a cumulative GPA equal to or greater than 2.25
Bad Performing Leavers (BPL)	Left after first term before second fall term with a cumulative GPA less than 2.25
Early Leavers (EL)	Left in the first term (did not complete first term)

Educational Significance

This research may call into question previous studies that used retention or GPA in isolation as the dependent measure. In particular, the results may spur further investigation of those studies of non-cognitive variables and of variables that appeared not to have a significant influence on retention. It will encourage researchers and practitioners to consider the complexity of the student experience when designing studies and when developing interventions to address student success.

It may also provide an option for institutions whose student population is homogeneous in regards to their academic readiness factors, particularly institutions that are more selective and whose student test scores and GPA are closely grouped. The need for additional types of predictive measures is increased in highly selective institutions where there is less variability in the academic readiness factors. The homogeneity of the most often used predictive variables (GPA, test scores, etc.) can make it difficult to identify the most at-risk students.

While the best predictor of academic success is previous success, this has limited utility for planning and developing support and interventions for at-risk students, as it does not provide reasons for the Performance nor suggestions as to how it can be improved. In addition to predictors that are relevant for admissions decisions, institutions need predictions that support the design and targeting of services and support to those admitted students who are at risk of not succeeding.

Conclusion

In this section, the purpose and general outline of the present study were briefly discussed. In the following section, the related literature will be reviewed. Literature on Performance and Persistence studies, as well as self-efficacy, will be explored.

Chapter Two

Review of the Literature

This paper is guided by Dorothy Knoell's 1960 critique of educational research in which she summarized, "The bulk of the research [is] unimaginative and unproductive, in terms of discovering new knowledge or attempting to develop techniques for controlling the situation" (Knoell, 1960, p. 41). One of the primary recommendations she made for future research was to separate the different types of withdrawals (and Persistence) and to treat these groups as separate entities. Embedded within these recommendations was the suggestion to make use of Performance and Persistence simultaneously.

The current study applies this early line of research on how academic readiness factors (HS GPA and standardized test scores) and self-efficacy measures are related to academic success, defined by either academic performance (College GPA) or persistence (retention in college) versus being defined by academic performance and persistence together. Examining the difference between these two methods of defining academic success will be important to understanding the use of cognitive and non-cognitive factors in academic outcomes research and in higher education practice.

This literature review chapter reveals that while some researchers in the 1960s and 1970s followed Knoell's recommendations, the importance of simultaneously using Performance and Persistence in higher education outcome research has been largely ignored by modern researchers. The following quote from 1964 remains applicable today: "It must be remembered throughout the reading of this study that there is no

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really comparable literature, since default and dropout are everywhere else merged into 'not continuing long enough to receive the baccalaureate degree'" (Rose, 1964, p. 403).

The literature review will briefly highlight the early studies that used separate outcome groups. It will then provide an overview of literature that is more current and will look at how higher education outcomes are defined, particularly in those studies that explore the role of non-cognitive variables in student success.

Beyond Attrition and Retention

Dorothy Knoell spoke at a research conference on college students, co-sponsored by the Western Interstate Commission for Higher Education (WICHE) and the Center for the Study of Higher Education (formerly the Center for Research and Development in Higher Education and now the Center for Studies in Higher Education), during which she reviewed institutional research on retention and withdrawal (Sprague, 1960). Knoell at the time was a consultant in state college curricula with the California Department of Education. She later worked for the California Postsecondary Education Commission before retiring as the Chief Policy Analyst. She was an early researcher on the role of community colleges and the need to strengthen the articulation between community colleges and four-year institutions.

Knoell reviewed of a number of research studies on retention and withdrawal and concluded that the researchers had failed "to separate voluntary withdrawals and dismissals, [which was a] fairly serious limitation in the current research" (p. 41). She found that predictive studies that looked at academic preparedness variables did not refine educational outcomes beyond "Persistence to normal graduation" and

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"withdrawal." In these studies, the condition of withdrawal ("good standing, failing, or without academic record") was not typically distinguished. Knoell noted that when "dismissals are confounded with voluntary withdrawals, [the relationships] are rendered meaningless" (p. 57). She further stated, "When the two groups are separated, approaches to prediction, diagnosis, and remediation are different" (p. 57).

Knoell did discuss one study from the University of California that differentiated between those students who withdrew with a college GPA of above 2.0, and those who withdrew with a GPA below 2.0. However, the few studies that did differentiate between the types of withdrawals limited the distinction to voluntary and involuntary withdrawals. Knoell found this to be incomplete because these categories continued to group students whose reasons for withdrawing were not necessarily similar. She noted that the "current lumping of withdrawals for all reasons may be obscuring relationships with non-academic variables, while producing spurious relationships with high school grades and test scores" (p. 56).

Knoell proposed that colleges develop a "classification system for withdrawal and that this classification system should be the basis for research and practice" (p. 56). She suggested a classification system that would not only include the type or circumstances of withdrawal, but would also include the prognosis or expectations of the institutions. Those students who were dismissed and were not expected to be successful at the time of admission would be separated from those whom the data predicted would be successful. She recommended separating the voluntary withdrawals into those who left after completing a short-term program, got a job, or got married,

from those who voluntarily left because of "dissatisfaction or poor adjustment" (p. 58)

Those students who transferred would be in a separate category from those whose

withdrawals were temporary.

Iffert (1957) is one of the first researchers who differentiated between different

types of students who stay in or leave college. He used 10 different categories to describe

student Persistence through graduation. These categories included those students who

graduated "in regular progression from institution of first registration," those who

completed their 4th year but didn't graduate, those who transferred to another institution

(he subcategorized those who transferred to a small and larger institution separately),

those who withdrew during the term, those who withdrew after the term, those who

dropped out and returned, and those with no information. He did not differentiate

between the academic performance of those students at the time of withdrawal or their

academic performance while persisting at the institution.

Wooster and Stover (1958) noted the relative lack of studies on the reasons for

students' leaving in their review of the reasons for students leaving the Education

College of Ohio State University. While Wooster and Stover's study was a retrospective

look at the reasons students left, rather than a predictive study, the authors do note that

"the use of high-school marks, recommendation of high-school teachers, and test

scores…might serve to reduce losses due to dismissal for academic failure, but it

probably would not be effective in reducing losses due to voluntary withdrawal" (p. 89).

They note that "most of those who just stop going to college, the 'dropouts,' are not of

low academic rank; many of them are above average students" (p. 89).

Harriet Rose incorporated Knoell's recommendations into her 1964 dissertation

at the University of Kentucky on predicting and preventing first-year student attrition

(Rose, 1964). She later became Professor (now Professor Emeritus) of Psychology at the

University of Kentucky.

In her dissertation, Rose focused on determining whether counseling could serve

as a deterrent to first-year student attrition. She therefore sought to separate the

influence that academic ability had on attrition and to determine what personality

characteristics are related to a student's Persistence or retention in college. Subjects in

her study were first year students who took a battery of personality tests, which

included measures on anxiety, hostility, scholastic orientation, and social integration.

Her study did not find a link between scholastic ability (including high school GPA and

reading comprehension scores) and attrition when controlling for different types

withdrawal (and continuation) students. However, she did find a link between the

personality characteristics and attrition. She argued that therefore students must be

treated differently in research on student retention and in practices designed to keep

these students in school based on the different types of withdrawal or continuation. She

stated, "Withdrawal within semester seems to constitute…a different kind of act than

the successful—or even unsuccessful—completion of a semester, after which the student

does not return to college" (p. 6).

Rose published a paper based on her dissertation that further compared those

who persisted into the second year with a "C" average or higher, and those with less

than a "C" average (1965). In this study, she created three groups: Defaulters (those who

voluntarily left during the semester), Successful Persisters (those who continued with a cumulative GPA of 2.0 or higher), and Unsuccessful or Probation Persisters (those who continued with a cumulative GPA of less than 2.0).

Her analysis found that personality characteristics were able to identify correctly 73.8 percent of the Probation Persisters; overall, 55 percent of the individuals were correctly identified. She contended that, "The highly accurate identification of Probation Persisters on the basis of personality variables alone…may be one of the most important contributions of this study…." (p. 403).

Rose and Elton (1966) followed up this work with a study that further differentiated the student outcome groups to include a 4th group who left college while in good standing. They performed a similar study looking at personality characteristics as related to these outcomes and found that they were able to differentiate between the student outcome groups.

Eckland (1964) argued that the source of error in college attrition studies was the lack of subcategorization of attrition as the dependent variable. He argued that it was necessary to define attrition beyond just whether the student left or not. In his study, he focused on creating categories that reflect the timing and academic circumstances of a student's withdrawal and the likelihood of their returning to college. He used 15 intellective and non-intellective variables that had been used in other attrition and graduation studies as independent variables. His study found that the refining of the outcomes to reflect more accurately the types of student experiences resulted in the "intellective" and "non-intellective" variables no longer being stable predictors of

attrition or graduation. He discovered that the predictive variables responded differently to each individual subcategory of students who dropped out.

Boyer and Michael (1965) reviewed the research related to educational outcomes between 1960 and 1965. One section of their review was focused on the redefinition of college dropouts. Their primary contention was related to the fact that many dropouts are only temporary; individuals may drop out of a particular college, but they often subsequently enroll in a different institution in the future. They note the budding understanding of the complexity of attrition and that future research must respond to the related implications.

Suczek and Alfert (1966) investigated attrition at the University of California, Berkeley with an objective to determine whether personality characteristics can be used to differentiate between students who "drop out when they are failing and students who drop out while in good standing" (p. 2). They found that those students who dropped out while failing were less mature, had higher levels of ethnocentrism, and less impulse control. Those students who left while in good standing tended to express greater sophistication and personal freedom, and they scored lower on scales of authoritarianism.

As an example of a research study during this time that did not differentiate between types of student withdrawals, Panos and Astin (1968), perhaps unaware of Knoell's recommendations, examined student attrition using a traditional dichotomous definition of *retained* or *withdrew* in a large national study with over 30,000 students from 250 institutions. They measured a number of variables related to student biographical

background: attitude, values, and other personality traits; educational and vocational plans; and college experiences in order to determine if they could predict whether the student would drop out of college.

The authors expressed surprise when they were not able to find significant results given the sample size and nature of the study. They gave possible reasons for their lack of significant results, including that attrition/Persistence is in fact a heterogeneous variable. In their discussion of this possibility, they state, "With regard to the heterogeneous nature of the dropout criterion, we feel that the kinds of analysis presented in the present study should be repeated in studies where the students are further classified as to their reasons for dropping out. By comparing such relatively homogeneous criterion-status subsamples it may be possible to improve our predictive accuracy and thereby to shed more light on the attrition process" (p. 70-71). Though they noted that further analysis utilizing the division of the attrition/Persistence groups was underway, a review of the literature was not successful in determining whether this research was ever completed or published.

Noting a lack of studies that made use of a typological approach to college withdrawals, Savicki, Schumer, and Stanfield (1970) investigated the role that college environment has with different types of withdrawals. They found that previous studies were imprecise and incomplete in their definitions of withdrawal. They hypothesized that those students who leave (or stay) for different reasons or in different situations are "psychologically different" from each other. They created five groups based on Persistence, actual grade point average, and predicted GPA: Successful Persisters (GPA

higher than 2.0 and an actual GPA within .5 of their predicted GPA), Probation

Persisters (GPA less than 2.0), Dropouts (withdrew at the end of the term), Dismissals

(institutionally suspended for "scholastic deficiencies"), and Defaulters (withdrew

during the term regardless of GPA).

Their study was able to differentiate the different types of Persistence/

withdrawal groups through scores on eight role-orientation scales. They found that

these subgroups were distinct, with overlap between separate Persistence and

Withdrawal groups. When the Persistence and Withdrawal groups were collapsed into a

dichotomous variable, the orientation scales were no longer able to accurately predict

membership.

In two similar articles, Rossmann and Kirk (1970) and Johansson and Rossmann

(1973) distinguished the Withdrawal group as being either voluntary or non-voluntary.

Rossman and Kirk created four groups: Persisters, Voluntary Withdrawal (GPA higher

than 2.0), Failure (GPA lower than 2.0), and Withdrawal-returnees. They defined Non-

Voluntary Withdrawals (Failure group) as all students who withdrew by their own

choice or because of institutional action with a GPA less than 2.0. Their purpose was to

differentiate those students with a low GPA who choose to leave from those whose low

GPAs caused the institution to withdraw the student. They identified the student's

academic performance as the unifying factor, not the student's direct action related to

enrollment.

Though they created these four groups, their analysis was limited to comparing

pairs of the groups rather than all groups. They found significant differences between

those who Persisted and the Voluntary Withdrawals on School and College Ability Tests

(SCAT) and on several of the scales on the Omnibus Personality Inventory (OPI). They

also found similar differences in these measures between the Voluntary Withdrawal and

Failure groups. They point to their results as supporting the contention that it is

"methodologically unwise to group Voluntary Withdraws and Failures in the same

dropout category" (p. 61).

In a similar study seeking to replicate the Rossman and Kirk's University of

California - Berkeley study at a small liberal arts school (Macalester), Johansson and

Rossman (1973) used these same four groups, but further separated the Persister group

into those who graduated in four years and those who graduated in five years. This

study did not show the same types of differences between the Voluntary Withdrawals

and Persisters as the Berkeley study. Where significant differences were found, those

who withdrew appeared to be less intellectually oriented. It is interesting to note that the

Macalester study showed no precollege achievement or ability differences between the

Persisters and the Voluntary Withdrawals.

Maudal, Butcher, and Mauger (1974) also investigated the relationship between

personality factors and attrition. They looked for differences between Persisters,

Transfers, and Dropouts. They defined Dropouts as being those students who withdrew

by their own choice after at least one term. Unfortunately, they excluded those students

who withdrew in their first term and those students who were dismissed for academic

reasons. The authors did not give reasoning for the exclusion of these students even

though they had all completed the same testing and the number of students who were

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dismissed for academic reasons was greater than those who withdrew themselves. Nonetheless, with an analysis of 47 variables, they established factors that successfully predicted group membership.

While the distinction between the Persisters and Withdrawers may be important, Pantages and Creedon (1978) argue that it ignores the reasons for the poor performance. Perhaps more importantly, it ignores factors related to student motivation that might lead a student to continue until the institution took action. Knoell makes the point that it is important for the data to reflect the students' "opportunity to make a real choice about persistence" (1966). As a whole, these studies support the contention that Rose and Elton (1966) and Savicki et al. (1970) made that the different subgroups of students who leave or stay are in fact psychologically distinct from each other.

Eighteen years after Knoell's 1960 review, Pantages and Creedon (1978) published a review of attrition research between 1950 and 1975. While they did review some studies that had demonstrated the utility of further differentiation of those who withdraw, they, like Knoell, cite the need for future research to subcategorize the different types of dropout and non-dropout students for use in research.

Current Definitions

A review of more current research over the past 25 years on the factors related to academic success reveals a dearth of research that brings Performance and Persistence together as an outcome measure. The few studies that did explore this question are reviewed below.

Dietsche (1990) investigated attrition as related to institutional fit and "intellective" and "non-intellective" measures at the College of Applied Arts and Technology of Ontario. As part of his model, he established outcome categories of Successful Persisters (SP), Unsuccessful Persisters (UP), Successful Dropouts (SD), and Unsuccessful Dropouts (UD). He set a standard of above and below 60 percent academic average to define Successful and Unsuccessful Persisters and Dropouts respectively. While the information provided in the article in incomplete regarding statistical differences between the group means on the intellective and non-intellective measures, his narrative notes that the Successful Dropouts and the Successful Persisters did not differ on any of these measures. He also reported the Unsuccessful Dropouts were significantly "less certain about their vocational goals and future occupations" than Unsuccessful Persisters (p. 74).

The students were assessed on the non-intellective measures in the first week of enrollment and then again two months later. Dietsche found that the Unsuccessful Dropouts had the greatest change (reduction) in their score on the Value of Education, Confidence in Success, Educational Committement, Instituional Committement, Academic Involvement, and Job Orientation than that other groups. On all of these measures except Academic Involvement, Successful Persisters had the least amount of change followed by Unsuccessful Persisters, Successful Dropouts, and Unsuccessful Dropouts. On all measures except for Education Commitment, Successful Persisters saw an increase in scores, while Unsuccessful Dropouts had significant reductions in their scores on all of these measures.

Snyder, Hackett, Stewart, and Smith (2003), in a study on predicting the
academic performance and retention of students who needed developmental education,
used an outcome measure of having at least a 2.5 GPA and enrolling as a sophomore
student. All students who were not retained were placed together, as are those students
whose GPA was below 2.5. They found that group membership could be predicted
using variables on gender and high school GPA.

Interestingly, Snyder, et al. did not note the significance or uniqueness of their
definition of academic success by using Performance and Persistence together to define
educational outcomes. They provide no references to other literature that may have used
this as a model nor do they discuss the further use of the outcome definition. A review
of articles that cited Snyder did not reveal other studies using this same outcome
definition.

Predictors of Academic Success

The current research investigate the influence of refining the definition of student
success to include both Performance and Persistence within the context of Academic
Self-efficacy measures. It was believed that these measures would be particularly
responsive to providing a multilayered definition of academic outcomes.

While academic readiness variables like high school GPA, high school class rank,
and standardized test scores typically account for the majority of variance related to
academic performance and persistence literature (Lotkowski et al., 2004), these measures
have limited ability to provide adequate information about why a student's outcome
may be unexpected. These variables measure previous academic performance and while

they are good predictors of future performance, they do not provide information about the reasons for previous, current, or future performance or how it might be improved.

Non-cognitive measures attempt to describe the motivations, characteristics, and attitudes of students that cause high (or low) academic performance and persistence relative to other factors (Cortes, 2013). When academic and environmental factors are controlled, the differences in academic performance in college are often attributed to non-cognitive factors (Allen, Robbins, & Sawyer, 2009; Bean & Eaton, 2002; Cope & Hannah, 1975). Non-cognitive factors and skills, such as motivation and self-efficacy, play a large role in students being able to make use of cognitive skills in order to achieve academic success.

There is recognition in higher education that non-cognitive factors can supplement and/or support the predictive value of traditional factors of academic preparation, such as ACT/SAT score and high school GPA (Lotkowski et al., 2004). These factors have also been used in college admissions to supplement academic readiness factors, in order to identify those with low or high previous Performance who will be most likely to have future success (Jaschik, 2014, October 27; Sedlacek, 2004a).

Non-Cognitive

Summerskill (1962) reviewed the published research on college dropouts between 1920 and 1960. He noted that there were over 35 different studies exploring the relationship between college grades (Performance) and dropouts (Persistence), and that the academic and work characteristics and behaviors of those students who fail

academically were well documented. However, less was understood about the non-academic reasons for students who either under- or over-perform.

Inquiry into the reasons for and nature of student academic success beyond Performance has a long history. The first volume of *The Journal of Higher Education* in 1930 included a book review of *Student personnel work at Northwestern University* by Esther McDonald Lloyd-Jones (1929), in which her book was praised as a significant addition to the field by providing a model for addressing the "baffling" problem of student motivation and the importance of "mental hygiene" (p. 17). In the book, Lloyd-Jones (1929), described her attempts at Northwestern to discover those factors that either facilitated or inhibited student achievement and development. She attempted to understand those factors that are beyond academic preparation and are those that are termed in this present paper as non-cognitive variables.

Garrett (1949) reviewed literature related to college scholastic success; he reviewed 194 studies comparing high school scholarship, achievement tests, intelligence, aptitude tests, and other factors in terms of their relationship with college grades. His purpose was to "find some means of determining the order of importance of the various characteristics in the profile [to] have a better basis for predicting success in any given college" (p. 130). He equated college grades with success in college and did not explore any studies related to persistence or retention. Garrett maintained that the institution's responsibility was only to admit students who can pass the courses, and if they leave, it is their choice. He noted that there was "mounting evidence that some college entrance requirements are invalid and thus are unfair to many worthy young people; and that the

college could and should broaden its curriculum to attract students of many kinds of ability other than the purely academic" (p. 91). However, he does not take the step of identifying other traits that may inhibit a student's capacity to demonstrate their academic abilities or to explore why students were not successful in college.

Fishman and Pasanella (1960) reviewed literature on "non-intellective," or what is currently referred to as non-cognitive, factors and highlighted the longstanding understanding that "some of a group of applicants of similar superior academic talents will be better able to apply their talents to college work than others, as a result of motivational, attitudinal, or personality factors" (p. 304). They described non-cognitive characteristics that would lead to more success as "facilitating personality characteristics" versus the "interfering personality characteristics," which would influence academic success (p. 304).

Thresher (1966), Director of Admissions Emeritus at Massachusetts Institute of Technology, described the challenges facing admissions decision committees at highly selective institutions. He notes that once a certain threshold is met on academic factors, the decisions between candidates are somewhat random and "ignorant" because there is no accurate information about how the student will apply his or her aptitude. On the other end of the spectrum, Thresher acknowledges the admissions committees' fear of denying the application of a student and then in the future being faced with a story of the "Ugly Duckling, Cinderella, or 'the stone that the builders rejected'" (p. 50). Thresher summed up the challenge of college admissions offices by saying, "First, one cannot tell by looking at a toad how far he will jump; second, the process of admission to college

[and presumably retention and graduation] is more sociologically and intellectually determined" (p. 1).

Cope & Hannah (1975) continued the recognition that there were factors beyond academic ones that influenced a student's ultimate success. They note that it is "virtually impossible" to identify those students who will persist from the data that is available upon admission applications. They further identify the challenge that highly selective institutions face with students whose academic entrance profile only represents a small portion of the overall range of data. For these institutions, they note that the academic background alone is not sufficient to make distinctions between different students because the backgrounds are "relatively homogeneous."

Pervin, Reik, and Dalrymple (1966b), in a book entitled *The college dropout and the utilization of talent*, noted that talented students leave college at a rate that is "less uncommon than parents realize" (p. 5) They highlight the other personal characteristics beyond ability that have a direct influence on a student's likelihood of dropping out. The authors note that many of the students who drop out are "struggling to free themselves from bonds and shackles preventing the free and effective use of their talents" (p. 19). The discussion of these "shackles" parallels the current discussion of non-cognitive factors that seem to influence students' ability to be successful.

In an earlier work, Reik (1962) cautioned that researchers "draw conclusions on the basis of the (registrar's) records, despite the fact that – though impeccably sound in the narrow, statistical sense – they actually mirror little of the complexities of human life" (p.442). She found that having high academic scores was "no guarantee against the

urge to drop out" (p.445). Later, in 1966, researchers are warned about becoming too

reliant on computers and the ease with which they allow for research, since the data

easily captured by the institution were limited and might not represent the complexities

of individual students (Pervin, Reik, & Dalrymple, 1966a).

Non-Cognitive Factors, Self-Efficacy, and Academic Self-Efficacy

It is difficult to trace the origins of the study of non-cognitive factors. Certainly,

as discussed above, researchers for 50 years or more have explored personal,

psychological, and other non-academic reasons for student success (Cope & Hannah,

1975; Pervin et al., 1966b; Pitcher & Blaushild, 1970; Reik, 1962). However, we can point

to more recent research focusing on these factors and their relationship with admissions,

retention, and graduation (Jaschik, 2014, October 27; Lotkowski et al., 2004; Robbins et

al., 2004; Sedlacek, 2004b).

Sedlacek and Brooks (1976) presented non-cognitive variables as part of an

overall model of addressing racism. They contended that traditional measures of

aptitude insufficiently described a person's potential and the measures were in fact

racially biased. They called for the use of additional non-cognitive variables to judge

potential. In a related work, Messick (1979) discussed both cognitive and non-cognitive

measures and argued for the use of both. He argued that "the distinction between

cognitive and non-cognitive assessment is…not categorical, but one of degree in the

relative balance between intellective and other personality determinants of individual

differences" (p. 282). Sedlacek continued this line of reasoning and in 2004 published

Beyond the big test: Noncognitive assessment in higher education, which outlined the use of

non-cognitive measures as both alternatives and supplements to standardized test scores.

In 2004, two other works were published that provided a broad review of academically related non-cognitive variables. ACT published a policy report, *The role of academic and non-academic factors in improving college retention* (Lotkowski et al., 2004). This report was based on a companion meta-analysis of 104 studies on the relationship between academic and non-academic factors and postsecondary success as defined by retention and GPA (Robbins et al., 2004). The ACT report summarized the findings and made specific recommendations to higher education institutions for their usage.

ACT's report condensed the non-academic factors from the 104 studies into 10 factors, including academic-related skills, academic self-confidence, academic goals, institutional commitment, social support, contextual influences, social involvement, achievement motivation, and general self-concept. They found that a combination of the academic factors and the strongest non-academic factors accounted for 17 percent of the variance of college retention and 26 percent of the variance in college GPA. The specific set of non-academic factors was different for the two outcomes, with academic self-confidence as the only variable shared by both formulas. It is also important to note that they found that non-cognitive factors accounted for more variance in GPA than in retention.

Bean and Eaton (2002) present a compelling argument for the inclusion of what they term "psychological process" in the development and understanding of retention interventions. They note that the decision to attend and to stay in higher education is

personal and voluntary. Students are not compelled, at least by law, to stay or to be

engaged in college. Therefore, the processes and reasoning by which a student makes

these decisions is intensely personal and individualized, and involves complex

interactions between the many academic and non-academic factors, as well as the

context of the student's experiences. Bean and Eaton include self-efficacy as one of the

four theories on which they base their psychological model for retention programming.

The authors reviewed different types of retention programming and analyzed them

based on how they influence a student's self-efficacy and other non-cognitive factors.

Their work resulted in a model for retention that includes non-academic aspects of

student Persistence and retention.

Self-Efficacy

Bandura's work on self-efficacy highlights the importance of an individual's

belief about their own ability to perform a task to their actual ability to perform that

task, which has obvious implications for academic performance (Bandura, 1977, 2006,

1995; Bandura, Adams, Hardy, & Howells, 1980). Following the precepts of self-efficacy,

there is great value in simply asking students about their confidence in performing tasks

related to academic success. According to Bandura, this "first-hand" belief is the most

important perspective in understanding whether an individual can accomplish a task

(Bandura, 1977). While self-efficacy can easily be seen as being related to an accurate

self-assessment, self-efficacy is different in that it focuses on the belief about one's own

ability to accomplish a task or to develop skills regardless of the rational likelihood of

that success (Baumeister, Campbell, Krueger, & Vohs, 2003). Bloom (1976) posited that

his Mastery Learning concept is similar to self-efficacy in the education setting. He described the importance of how the student feels about "school, about learning, about subject matter, and about the self as a learner" (p. 174). He argued that these attitudes about learning are so important that they should be pursued as an "educational objective in their own right" (p.175).

Zajacova, Lynch, and Espenshade (2005) looked at the relationship between self-efficacy and academic performance and persistence. While they found a relationship with GPA, they did not find a relationship with retention. However, they did not explore the relationship that self-efficacy might have with an outcome measure combining both Performance and Persistence.

Allen et al. (2009) also found that non-cognitive variables, including self-efficacy, increase the predictability of academic factors in relation to academic performance. While they did not study retention specifically, they argue that since the likelihood of staying in college increases as college GPA increases, predictors of academic performance are also predictors of retention.

Brown et al. (2008) conducted a meta-analytic path analysis study of self-efficacy and academic performance and persistence. Their model explored the direct and indirect relationship of self-efficacy on college GPA and Persistence (separately) through academic goals while controlling for ACT/SAT scores. They found that self-efficacy directly influenced college GPA and had both direct and indirect influences on Persistence.

Richardson, Abraham, and Bond (2012) conducted a meta-analytic study of what they termed "psychological correlates" to academic performance (GPA). Their study included 217 individual papers with 241 data sets. Through these studies, they identified 42 non-cognitive factors that had been studied in relationship to GPA. Among the variables that they included were measures of self-efficacy, which they found to be correlated with GPA. A limitation of this research is that self-efficacy was not measured in the studies prior to enrollment. Therefore, early experiences in college would have had the opportunity to influence both individual self-efficacy scores and GPA. Additionally, they did not explore any relationships with retention as an outcome measure by itself or in combination with Performance.

Conclusion

This literature review outlined the background for the current study's proposal to define student success using a combination of Performance and Persistence rather than using these outcome measures separately. While there was a brief period in the history of higher education studies where this approach was used, it has not been utilized with any regularity for over 40 years. Additionally, this approach has not been used in the study of Academic Self-efficacy measures.

Chapter Three

Methodology

The purpose of this study is to investigate how combining measures of Performance and Persistence (retention and GPA) into a composite variable changes the relationships of traditional measures of academic success (high school GPA and standardized test scores) and of measures of Academic Self-efficacy, as opposed to looking at retention and GPA separately. This composite variable will group students who withdraw or persist by their level of academic performance in order to explore whether this more nuanced definition of student outcome results in similar or different relationships.

The composite outcome variables was proposed in recognition that retention, as a dichotomous variable, does not adequately represent the variety of students who either stay or leave. Simply put, all "stayers" or "leavers" do not stay or leave for the same reasons. To categorize them within just two groups over-simplifies the student experience and potentially masks the ability of the independent variables to differentiate between the groups.

The research design is purposefully simple in order to demonstrate the applicability and usability of this approach to other research and institutional data-gathering settings. This design also serves as a first step to other, potentially more complex research studies. As such, the research question can be simplified to "Does it make a difference to combine or disaggregate Performance and Persistence?"

Research Questions

This study was focused on whether Academic Self-efficacy and Academic Readiness factors relate differently to Performance and Persistence, both when they are combined into one composite variable and when considered separately. Based on data from a pilot study, it was hypothesized that more self-efficacy items will be related to these outcome variables as a composite variable than when Performance and Persistence are kept separate.

Data Source

The study used data from an existing dataset from an institutionally administered survey and from Berea college's student information system on academic performance and persistence, as well as limited biographic information (gender, first generation status, etc.), but did not include individually identifiable information such as college ID numbers. Data on academic performance and enrollment, as well as demographics, were based on Berea College's institutionally developed definitions. Berea College has approved use of the survey data in this study. Data are kept on a password-protected computer that is stored in a locked office.

Dependent Variables

Persistence

In this study, student Persistence was operationalized as students who are enrolled at the beginning of the fall term following his or her first year. The date of withdrawal, if applicable, was gathered. When Persistence was used alone, all students who left the institution prior to their second year were considered to not be retained,

even if they complete their first two terms. This definition is consistent with Berea College policies and federal reporting requirements. Students who leave during their third term were considered stayers.

Performance

Cumulative GPA, measured on a 4-point scale, was based on the total grades earned through the student's last completed term of attendance. Therefore, students who left in their second term prior to grades being recorded had a cumulative GPA based solely on their first and only term. Students who returned for their second year had a cumulative GPA based on their first two terms and, if applicable, summer terms. Consistent with Berea College polices, developmental courses were included in the GPA calculation. Only grades for courses completed at the institution were counted toward GPA. Transfer credits were not included in the GPA calculation. Students who left in their first term prior to the deadline to withdraw from the college without a grade being reported did not have a GPA and therefore were not included in analysis where Performance is used alone.

A separate dichotomized variable of GPA was created with students who earned a 2.25 or higher in one group and those who earned a GPA lower than a 2.25 in the other. This cutoff was chosen in a somewhat arbitrary fashion prior to data being collected. The institution's overall mean term GPA is 2.87 and research by the Berea College's institutional research office does not show a break -off where retention is significantly higher or lower, even though there does seem to be a relationship between GPA and retention. The institution's standards for satisfactory academic progress state

that a student must have a cumulative GPA of 2.0 or higher in order to be in good

academic standing. A 2.25 GPA reflects average grades between a C and C+. A small

focus group of students was also consulted to determine what GPA they perceived to be

less than satisfactory, i.e. bad. There was agreement by the group that a 2.25 reflected a

point at which the academic performance moved between good and bad. It is important

to note that the average high school GPA of incoming students was 3.45, which likely

factors into where they might set a break point for acceptable college GPA.

One factor in choosing the cut-point was to preserve the group of students who

were good performers yet left the college so that it included students whose perception

of their grades was that they were satisfactory. This was important so that the reasons

that students in this group left could be assumed to be for something other than

academic grades.

It was also decided to dichotomize the data rather than develop multiple

categories to preserve the simplicity of the study design. Future work may want to

explore creating three or more groups to reflect different levels of performance or to

only compare the lowest and highest performers.

Performance/Persistence Composite Variable

A composite variable that accounts for the level of academic performance at the

time of leaving the institution or at the beginning of the second fall term was developed.

A two by two matrix (see Figure 2 below) was used to create four separate groups based

on whether the student's Performance was above or below a 2.25 and whether the

student stayed or left. A fifth group was be formed, which is not represented in this

matrix, for those students who left in their first term prior to receiving grades at the institution.

Figure 2:

Matrix for the development of composite variable

	Persistence	
Performance	Stay	Leave
Good		
Bad		

The resulting five groups were labeled Good Performing Stayers (GPS), Bad Performing Stayers (BPS), Good Performing Leavers (GPL), Bad Performing Leavers (BPL), and Early Leavers (EL). Refer to Table 1 for definitions of these groups. Future research might consider forming three or more levels of Performance reflecting low, medium, and high Performance, but this is beyond the scope of the current project.

Independent Variables

In this study, the independent variables were Academic Readiness factors and answers to Academic Self-efficacy items. The Academic Readiness factors included high school GPA, high school percentile rank, ACT Composite, English, Math, and Science Reasoning scores. (Note that while the Berea College accepts both ACT and SAT, most students provide ACT scores.)

The Academic Self-efficacy measure was based on an institutionally developed survey instrument. It was developed using existing literature, along with input from Berea College faculty, staff, and students to measure academic expectations and self-efficacy and other key non-cognitive variables. The survey was designed to be administered after acceptance for admission, but prior to matriculation and arrival on campus.

The survey was piloted in the fall of 2010 with incoming students and the results were explored as to the relationship between academic success and Persistence and Performance. Based on this pilot, the instrument was slightly modified and then administered to all incoming students in 2011, 2012, and 2013, with a response rate of over 98 percent.

The survey included 24 self-efficacy items (see Table 2 below) that students were asked to rate regarding "How certain are you that you will be able to perform and accomplish the following expectations and responsibilities in order to be successful at Berea College?" The question prompt was modeled on templates provided by Bandura (Bandura, 2006; Bandura et al., 1980). The pilot study followed Bandura's recommendations; all items regarding self-efficacy were measured on a 0-100 point scale and lead-in instructions were modeled after examples provided by Bandura. However, the scale was changed to a 0-10 scale after the pilot based on comments from subjects and the lack of use of the full range of the 100-point scale.

Table 2

Self-efficacy items

	Items as included in survey	Label
1.	Keep up with required class reading	Read
2.	Use effective college-level study strategies	Study
3.	Understand expectations of the instructors	Intructors
4.	Understand the expectations of the labor program	Laborprogram
5.	Perform adequately in your labor position	LaborPerformance
6.	Write college-level papers	Papers
7.	Be successful in math classes	Mathsuccessful
8.	Take notes that will help you to learn and pass your classes	Notes
9.	Meet the expectations you have of yourself	Expectation
10.	Understand the concepts taught in your classes	Concepts
11.	Develop mutually supportive relationships with other students	Relationship
12.	Study outside of class at least 2 hours for every one hour of class time	Studyoutclass
13.	Figure out how to do the most difficult class work by asking others for help	Difficult
14.	Balance labor, academic, and personal time	Balance
15.	Not give up when school gets difficult	Giveup
16.	Learn class material, even if the work is hard	Learnhard
17.	Ask for help from instructors	Instructorhelp
18.	Graduate from college	Gradcollege
19.	Reach your academic goals	Goals
20.	Earn a degree from Berea College	Bcdegree
21.	Meet the expectations of your family and friends regarding getting a degree	Meetfamfrdexp
22.	Attend graduate school after earning your undergraduate degree	Graduateschool
23.	Feel "at home" in Berea	Home
24.	Be involved in extra-curricular activities such as choir, debate, campus clubs, sports, service while maintaining academics	Extracuractvs

Sampling Frame

The target population for this study was incoming students at Berea College. A census sampling design was employed through the inclusion of the survey in the administrative "on-boarding" processes for incoming students. The sampling design resulted in a response rate of over 98 percent.

All incoming students to the institution participate in an online orientation, which is accessed by logging into the incoming student portal with their individual college-issued username and password. The portal includes processes related to course selection, registration for summer orientation, roommate requests, and other administrative tasks. The orientation portal also includes informational sections about financial aid, residence life, and other college requirements. The information sections are followed by a short series of questions that students must answer before being able to move forward in the process. The last step of the process is the designation of the courses that the student would like to register for in the first term, which acts as an incentive for students to complete the other parts of the online orientation.

As part of the online orientation, students were presented with the survey. While students were not required to complete the survey in order to complete the online orientation, they had to open it before being able to move forward with other steps in the pre-arrival process. Students were told that they would not be penalized for not completing the survey and were given instructions on how to proceed to the next section of the on-line orientation without completing the survey. Under these conditions, the completion rate of the survey was over 98 percent.

In order to be included in the analysis, certain criteria must be met. Only new first-time full-time domestic degree seeking students were included. Transfer students, as defined by having been a degree-seeking student post-high school at a different institution, were not included in the analysis. Individual items that were blank were excluded for item analysis and in those instances where more than half of the all of the items are blank, all of that individual's survey responses were excluded.

Data Analysis

The group means of those retained or not and those with a cumulative GPA above versus below 2.25 were compared on individual Academic Readiness factors and the self-efficacy items. Additionally, a regression analysis were conducted between the Academic Readiness factors and the self-efficacy items and GPA on a 4.0-point scale. The regression were conducted to determine what, if any, relationships might have been hidden because of the dichotomization of the Performance variable.

In the next step, the mean scores on the Academic Readiness factors and self-efficacy items were again be compared, this time using the composite outcome categories that were developed using Performance and Persistence together. An Analysis of Variance (ANOVA) was used to determine whether there are significant differences between the outcome categories for each independent variable. For those items where significant differences are found, *t-tests* will be used to compare means of the individual groups.

The analysis will be limited to the item level. The total number of self-efficacy items that have significant differences between the dependent variable groups will be

noted. Future research may explore conducting a factor analysis on the items to determine how they are interrelated and to determine if there are some overarching concepts or factors within this group. This factor analysis was not done at this point, as the focus of this research study is to explore how modifying the definition of the outcome measure changes the relationship with the independent variables rather than the development of the survey of self-efficacy items.

The information on the groups with significant differences (p<.05) are noted in the tables. In order to visually represent the influence of defining retention outcomes more precisely than simply retained or not, the results are also presented in a table denoting only whether the difference between group means are significant (without specific data on group means) to the self-efficacy items and Academic Readiness data of students. This table serves as a visual representation of how the two approaches to the definition of the outcome variables differ from each other. A table listing the group means of the different outcome measures by Academic Readiness factors and self-efficacy items were also provided.

Educational Significance

The methodology of this study will provide a model for others to consider when conducting studies and assessments of student success. The use of a composite Performance and Persistence measure may be of use for reevaluating previous studies that failed to find significant relationships with retention and/or Performance alone. This study is also designed to demonstrate further the importance of Academic Self-efficacy in the ultimate success of students.

This research is particularly applicable to highly selective institutions and other institutions whose students represent a narrow band of Academic Readiness factors. For these institutions, it is especially important to have the fullest understanding of the role that non-cognitive factors play in predicting student success.

Multiple levels of policy and programmatic decisions are reliant on what does or does not influence student success. Student success has typically been defined formatively in terms of retention rates and summatively in terms of graduation. While learning outcomes also represent important concepts in the assessment of student success, they are very difficult to assess at the institutional and broader levels of higher education. Therefore, even in those environments where student-learning outcomes are highly valued, the use of grades and GPA as proxies for student learning in assessment and research are needed. As higher education institutions are subject to more accountability to their accreditors, the public, and their students, these measures of retention and GPA increase in importance.

Conclusion

This chapter described the methods that will be used to explore the primary research question for this study: does defining academic success using Performance and Persistence together differ from using Performance and Persistence separately when measuring the relationship with Academic Readiness factors and measures of Academic Self-efficacy?

Hypothesis: More self-efficacy items will have significant relationships with a composite measure of Performance and Persistence than with these variables

disaggregated. That is, an increased number of self-efficacy items will have significantly

different means in groups defined simultaneously by a composite variable of

Performance and Persistence than in groups defined solely by Performance or

Persistence.

Chapter Four

Results

This chapter presents the results of the analysis of data designed to explore the question of whether combining measures of Performance and Persistence into a composite variable changes the relationship of traditional measures of academic success and of measures of Academic Self-efficacy, as opposed to looking at retention and GPA separately. It was expected that more self-efficacy items would have significant relationships with a composite measure of Performance and Persistence than with these variables disaggregated.

Demographics and Descriptive Statistics

Of 1091 total students who were eligible for inclusion in the study, 1070 completed the survey, representing a response rate of over 98 percent. As outlined in the methodology section, only domestic first-time degree-seeking students (not transfer students) who entered in the fall terms of 2011, 2012, or 2013 were included in the data set. Those students who did not complete at least half of the survey were not included in the dataset.

Of the 1070 students, 55 percent were female, 70 percent identified themselves as Caucasian only, and 30 percent identified themselves within multiple racial/ethnic categories. First generation students represented 47.7 percent of the population. It is important to note that because of Berea College's admissions eligibility requirements, all students would be considered to have come from low-income families.

Dependent Variables and Building the Composite Variable

In order to investigate the influence of different methods of defining academic

success, three different dependent variables were used for this study. The three variables

are Persistence (or Retention) in the institution after one year, Performance based on

cumulative GPA after one year, and a composite measure of both Performance and

Persistence.

Persistence

Student Persistence was operationalized as students who are enrolled at the

beginning of the fall term following their first year. The date of withdrawal, if

applicable, was gathered. When Persistence is used alone, all students who left the

institution prior to their second year were defined as "leavers," even if they completed

their first two terms. This definition is consistent with institutional policies and federal

reporting requirements. Students who left during their third term or who otherwise

continued will be considered "Stayers." A total of 81 percent of the students persisted

(i.e., were Stayers) to their second year of school.

Performance

The subjects who completed at least one term had an average cumulative GPA of

2.71 (SD .95; Range 4.00). As outlined in the Methodology section, cumulative GPA, was

measured on a 4-point scale and is based on the total grades earned through the

student's last completed term of attendance.

A separate dichotomized variable of GPA was created with students who earned

a 2.25 or higher in one group (Good Performers) and those who earned a GPA lower

than 2.25 in another (Bad Performers). The Good Performance group made up 80.2

percent of the students and 19.8 percent were categorized in the Bad Performing group.

Performance/Persistence composite variable

A composite variable was developed using both Performance and Persistence

together. Students were placed in one of five groups: Good Performing Stayers (GS),

Good Performing Leavers (GL), Bad Performing Stayers (BS), Bad Performing Leavers

(BL), and Early Leavers (EL): those students who left in their first term prior to receiving

grades at the institution.

The following table gives the definitions for each group and the number and

percentage of students who were in each group.

Table 3

Composite Variable Subject Distribution

Category	Definition	Subjects
Good Performing Stayers (GS)	Retained to second fall term with cumulative GPA equal to or greater than 2.25	752 (70.3%)
Bad Performing Stayers (BS)	Retained to second fall term with a cumulative GPA less than 2.25	115 (10.7%)
Good Performing Leavers (GL)	Left after first term but before second fall term with a cumulative GPA equal to or greater than 2.25	71 (6.6%)
Bad Performing Leavers (BL)	Left after first term before second fall term with a cumulative GPA less than 2.25	88 (8.2%)
Early Leavers (EL)	Left in the first term (did not complete first term)	44 (4.1%)

Independent Variables

The independent variables in this study are Academic Readiness and Academic Self-efficacy. The Academic Readiness factors include high school GPA, high school percentile rank, and ACT Composite, English, Math, and Science Reasoning scores. The survey included 24 self-efficacy items on which students were asked to rate on a 0 to 10 scale: "How certain are you that you will be able to perform and accomplish the following expectations and responsibilities in order to be successful at [the college]?" The average rating of the Academic Self-efficacy items was 8.57 (SD .61) and ranged from 7.44 (Mathsuccessful) to 9.76 (Gradcollege).

The list of the complete self-efficacy items can be found in Table 2. The table below outlines the average score of the Academic Readiness factors and the Self-Efficacy items.

Table 4

Mean Scores of the Academic Readiness and Self-Efficacy Items

	n	M	SD	Range	Min	Max
Academic readiness						
HS GPA	1,053	3.45	.47	4.00	0.00	4.00
HS percentile	931	81.87	14.45	91	9	100
ACT composite	920	24.28	3.33	17	16	33
ACT English	920	24.72	4.58	25	11	36
ACT math	920	23.18	3.49	21	15	36
ACT reading	920	25.72	4.99	23	13	36
ACT science	920	23.93	3.35	24	11	35
Self-efficacy						
Read	1,069	8.38	1.37	7	3	10
Study	1,069	7.80	1.54	8	2	10
Intructors	1,068	8.69	1.31	8	2	10
Laborprogram	1,069	9.21	1.05	10	0	10
Laborperformance	1,068	9.29	.97	8	2	10
Papers	1,067	7.89	1.56	10	0	10
Mathsuccessful	1,069	7.44	1.92	10	0	10
Notes	1,067	8.30	1.54	8	2	10
Expectation	1,062	8.25	1.59	10	0	10
Concepts	1,067	8.26	1.20	9	1	10
Relationship	1,059	8.29	1.51	10	0	10
Studyoutclass	1,068	7.51	1.87	10	0	10
Difficult	1,067	8.35	1.55	8	2	10
Balance	1,067	8.09	1.54	8	2	10
Giveup	1,062	9.13	1.23	10	0	10
Learnhard	1,067	8.78	1.13	7	3	10
Instructorhelp	1,065	8.95	1.38	8	2	10
Gradcollege	1,062	9.76	.66	6	4	10
Goals	1,065	9.16	1.05	8	2	10
BCdegree	1,059	9.62	.90	10	0	10
Meetfamfrdexp	1,058	9.14	1.31	10	0	10
Graduateschool	1,062	8.38	1.99	10	0	10
Home	1,060	8.54	1.62	10	0	10
Extracuractvs	1,059	8.56	1.70	10	0	10

Data Analysis

The group means of those retained or not and those with a cumulative GPA above

versus below 2.25 were compared on individual Academic Readiness factors and the

self-efficacy items. This section will first review the Academic Readiness Factors and

then the Self-Efficacy items. The results will then be presented in the following order:

Persistence/Retention, Performance/GPA, and then the Composite outcome measure.

The following tables give information on the average scores of the Academic

Readiness factors and the Academic Self-efficacy items within the five subgroups of the

composite Performance and Persistence outcome variable. These tables also designate

which of the individual *t*-tests revealed significant individual group difference on those

items that were shown to have overall group difference. This table will serve as a visual

representation of the different approaches to the definition of the outcome variables.

The averages are provided for the group as a whole, as well as for those who

retained and those who did not. The Good/Bad Performing groups are also presented,

based on those students who had a cumulative GPA of ±2.25. The items with statistically

significant differences are noted with their relative *p-value*. In the dichotomized

variables, the highest score in the statistically significant pairings is in bold. Note that

while the α for the study was .05, those with p-values less than .10 are included for

discussion in the post hoc analysis section.

Table 5

Academic Readiness Factors by Persistence and Performance (Continuous and Dichotomized)

	Persistence			Performance (continuous)	Performance (Good Performers)		
	No	Yes			No	Yes	
HS GPA	3.25	3.49	$F(1, 1051) = 45.05$, $p < .001$	$r = .367$, $n = 731$, $p < .0001$	3.10	3.54	$F(1, 1010) = 172.74$, $p < .001$
HS Percentile	77.30	82.90	$F(1, 929) = 22.28$, $p < .001$	$r = .331$, $n = 731$, $p < .0001$	72.59	84.48	$F(1, 894) = 111.38$, $p < .001$
ACT composite	23.90	24.30		$r = .220$, $n = 731$, $p < .0001$	23.36	24.54	$F(1, 875) = 17.75$, $p < .001$
ACT English	23.90	24.90	$F(1, 918) = 6.36$, $p = .012$	$r = .232$, $n = 731$, $p < .0001$	23.14	25.12	$F(1, 875) = 27.35$, $p < .001$
ACT Math	22.70	23.20		$r = .190$, $n = 731$, $p < .0001$	24.77	25.99	$F(1, 875) = 9.89$, $p = .002$
ACT Reading	25.30	25.80		$r = .169$, $n = 731$, $p < .0001$	22.47	23.41	$F(1, 875) = 8.20$, $p = .004$
ACT Science	23.90	23.94		$r = .127$, $n = 731$, $p < .0001$	23.39	24.09	$F(1, 875) = 5.84$, $p = .016$

Academic Readiness Factors and <u>Persistence</u>

Three of the Academic Readiness factors were found to be significantly related to Persistence. High school GPA (p<.001) and percentile rank (p<.001) were both significantly related to whether an individual was retained or not. The average high school GPA of those who were retained was 3.49, versus 3.25 for those who were not retained. Similarly, high school percentile rank of those retained was 82.9 percent while those not retained was 77.3 percent. The only other Academic Readiness factor that was significantly related to retention was the ACT English score (p=.012).

Academic Readiness Factors and <u>Performance</u>

All of the Academic Readiness scores were significantly related to Performance when both dichotomized into good and bad performing groups and measured on a 4.0-point scale.

The highest correlation values were found with HS GPA (r=.367, p<.001), HS Percentile (r=.331, p<.001), and ACT English (r=.232, p<.001), which are the same Academic Readiness variables that were significantly related to the Retention measure.

Table 6

Academic Readiness Factors by the Composite Measure Overall and Groups

	Overall	BL	BS	EL	GL	GS	BL-GL	BL-GS	BL-BS	BL-EL	GL-EL	GL-BS	GL-GS	GS-EL	GS-BS	BS-EL
HS GPA	3.45 [a]	3.11	3.09	3.20	3.45	3.55	x	x			x	x		x	x	
HS Percentile	81.87 [b]	73.25	72.11	75.51	82.60	84.68	x	x			x	x		x	x	
ACT Composite	24.28 [c]	23.92	22.89	23.67	24.13	24.59			x			x			x	
ACT English	24.72 [d]	23.28	23.02	24.20	24.59	25.18		x				x			x	
ACT Math	23.18 [e]	22.90	22.10	22.30	22.85	23.47								x	x	
ACT Reading	25.72 [e]	25.46	24.19	24.88	25.62	26.03									x	
ACT Science	23.93 [g]	24.10	22.80	23.51	23.92	24.11			x			x			x	

Note. BL = Bad Performing Leaver; BS = Bad Performing Stayer; EL = Early Leaver; GL = Good Performing Leaver; GS = Good Performing Stayer; [a] $F(4, 915) = 47.33$, $p < .001$; [b] $F(4, 915) = 29.53$, $p < .001$; [c] $F(4, 915) = 6.15$, $p < .001$; [d] $F(4, 915) = 7.02$, $p < .001$; [e] $F(4, 915) = 4.26$, $p = .002$; [f] $F(4, 915) = 3.16$, $p = .013$; [g] $F(4, 915) = 3.31$, $p = .011$

Academic Readiness Items and the <u>Composite</u> Variables

When Performance and Persistence were brought together in the composite variable, each of the Academic Readiness items continued to showed significant difference. The ANOVA of each of the Academic Readiness items revealed that there were significant differences between the composite measure subgroups. Individual *t*-tests were conducted and the Good Stayers were found to have significantly higher scores on each of the Academic Readiness factors than the other subgroups, except Good Leavers. There were three group pairings where significant differences were not found on any of the Academic Readiness factors: Bad Leavers vs Early Leavers, Good Leavers versus Good Stayers, and Bad Stayers Versus Early Leavers. It is perhaps notable that these three pairings include each of the five groups at least once.

Both high school GPA and high school percentile rank revealed significant difference in six of the 10 pairings. In addition to the three pairings listed above with no significant difference, HS GPA and HS percentile also did not have significant differences in the Bad Leavers versus Bad Stayers relationship. Added together, the ACT scores (composite and subscores) had significant relationship in five different pairings. The ACT scores, in addition to the three pairings listed above with no significant difference, also did not have significant differences in the Bad Leavers versus Good Leavers and Good Leavers versus Early Leavers.

Table 7

Self-Efficacy Items by Persistence and Performance (Continuous and Dichotomized)

	Persistence		Performance (continuous)	Good Performers	
	No	Yes		No	Yes
Read	8.32	8.39		8.40	8.36
Study	7.62	7.85		7.70	7.82
Intructors	8.67	8.69		8.77	8.65
Laborprogram	9.23	9.21		9.24	9.20
Laborperformance	9.21	9.31		9.24	9.29
Papers	7.90	7.89		7.88	7.87
Mathsuccessful	7.52	7.42		**7.74[d]**	7.37
Notes	8.00	**8.37[a]**	r = .064, n = 981, p = .023	8.18	8.34
Expectation	8.13	8.27	r = -.082, n = 981, p = .005	8.26	8.22
Concepts	8.37	8.24	r = -.082, n = 981, p = .005	8.40	8.22
Relationship	8.56	8.72		8.70	8.69
Studyoutclass	7.38	7.54		7.60	7.48
Difficult	8.14	**8.40[b]**		8.34	8.35
Balance	8.03	8.11	r = -.066, n = 981, p = .02	8.26	8.05
Giveup	8.93	**9.10[c]**		8.99	9.17
Learnhard	8.65	8.81		8.76	8.78
Instructorhelp	8.81	8.98		9.00	8.92
Gradcollege	9.68	9.78	r = .055, n = 981, p = .044	9.67	**9.70[e]**
Goals	9.13	9.16		9.04	9.17
BCdegree	9.57	9.64		9.56	9.64
Meetfamfrdexp	9.17	9.14		9.02	9.17
Graduateschool	8.25	8.41		8.31	8.38
Home	8.41	8.57	r = -.084, n = 981, p = .004	8.69	8.49
Extracuractvs	8.48	8.57		8.61	8.54

Note. [a]$F(1, 1065) = 9.62$, p = .002; [b]$F(1, 1065) = 4.58$, p = .033; [c]$F(1, 1060) = 7.04$, p = .008; [d]$F(1, 1023) = 6.10$, p = .014; [e]$F(1, 1016) = 4.91$, p = .027

Self-efficacy and <u>Persistence</u>

The 24 Academic Self-efficacy items were then analyzed on how they related to the three different definitions of academic success. Three self-efficacy items had significant differences between those who were retained and those who were not. These items were Notes (p=.002), Difficult (p=.033), and Giveup (p=.008).

Self-efficacy and <u>Performance</u>

Two Academic Self-efficacy items had significant differences between the Good Performing and the Bad Performing groups. These items were Mathsuccessful (p=.014) and Gradcollege (p=.027). Neither of these two self-efficacy items were the same as those that were significantly related to Persistence.

Six items had significant correlations with Performance when measured as a continuous variable (cumulative GPA on a 4.0 scale). These items were Notes (r=.064, p=.023), Expectations (r=-.082, p=.005), Concepts (r=-.082, p=.005), Balance (r=-.066, p=.02), Gradcollege (r-.055, p=.044), and Home (r=-.084, p=.004). Only one of these items, Gradcollege, was also significant with the dichotomized Performance variable. Only one of these items, Notes, was shared with Persistence. There was significant negative relationships in four of these five self-efficacy items and GPA, meaning that as the rating on the item goes up, the cumulative GPA goes down.

Table 8

Self-Efficacy Items by the Composite Measure - Overall and Groups

	All	BL	BS	EL	GL	GS	BL-GL	BL-GS	BL-BS	BL-EL	GL-EL	GL-BS	GL-GS	GS-EL	GS-BS	BS-EL
Read	8.38	8.33	8.47	8.59	8.15	8.38	8.38									
Study	7.80	7.47	7.87	8.00	7.57	7.84	7.80									
Intructors	8.69	8.65	8.86	8.95	8.50	8.66	8.69									
Laborprogram	9.21	9.17	9.29	9.34	9.23	9.20	9.21									
LaborPerformance	9.29[a]	9.00	9.42	9.45	9.32	9.29	9.29	x	x	x	x						
Papers	7.89	7.85	7.91	8.18	7.78	7.88	7.89									
Mathsuccessful	7.44	7.75	7.73	7.38	7.32	7.37	7.44									
Notes	8.30	7.96	8.34	8.11	7.98	8.38	8.30		x					x			
Expectation	8.25[b]	7.92	8.52	8.68	8.05	8.23	8.25		x	x	x	x	x				
Concepts	8.26[c]	8.48	8.33	8.50	8.15	8.22	8.26									
Relationship	8.29	8.55	8.82	8.56	8.59	8.70	8.69									
Studyoutclass	7.51	7.44	7.72	7.65	7.14	7.51	7.51									
Difficult	8.35	8.34	8.58	8.34	8.15	8.37	8.35									
Balance	8.09	8.05	8.41	8.13	7.94	8.06	8.09									
Giveup	9.13	8.83	9.12	9.09	8.95	9.19	9.13									
Learnhard	8.78	8.61	8.88	8.88	8.56	8.80	8.78									
Instructorhelp	8.95	8.80	9.14	9.11	8.64	8.95	8.95									
Gradcollege	9.76	9.63	9.70	9.70	9.72	9.79	9.76									
Goals	9.16	8.98	9.09	9.50	9.08	9.17	9.16									
Bcdegree	9.62	9.55	9.57	9.67	9.52	9.65	9.62									
Meetfamfrdexp	9.14	9.03	9.01	9.21	9.33	9.15	9.14									
Graduateschool	8.38	8.04	8.52	8.63	8.28	8.39	8.38									
Home	8.54[d]	8.51	8.83	8.75	8.07	8.53	8.54					x	x	x			
Extracuractvs	8.56	8.39	8.78	8.52	8.55	8.54	8.56									

Note. BL = Bad Performing Leaver; BS = Bad Performing Stayer; EL = Early Leaver; GL = Good Performing Leaver; GS = Good Performing Stayer; [a]$F(4, 1063) = 2.90$, $p = .021$; [b]$F(4, 1062) = 2.48$, $p = .042$; [c]$F(4, 1057) = 2.90$, $p = .021$; [d]$F(4, 1055) = 2.61$, $p = .034$

Self-efficacy and the <u>Composite</u> variable

Four of the 24 self-efficacy items showed significant difference within the composite groups. These items were Laborperformance (p=.021), Notes (p=.042), Expectation (p=.021), and Home (p=.034). It should also be noted that Giveup and Goals had relationships with *p*-values less than .10 and will be discussed further in the presentation of post-hoc analysis. The only item that showed significant results in Performance and Persistence separately and as a Composite variable was Notes. However, it should be noted that a significant relationship between Note and Performance was only found when Performance was measured as a continuous variable and not when it was dichotomized.

Laborperformance, while showing significant difference within the composite variables, did not display significant differences when Performance or Persistence were considered separately. Both Expectations and Home had significant differences between the composite groups and had a significant relationship with Cumulative GPA as a continuous variable.

Follow-up *t*-tests revealed that the four self-efficacy items with significant composite variable group difference had significant differences between seven of the 10 total possible pairings. The three pairings in which there were no differences on these four items were Good Stayers versus Early Leavers, Good Stayers versus Bad Stayers, and Bad Stayers versus Early Leavers. Bad Leavers were significantly different from each of the other groups on at least one item. The Bad Stayers versus the Early Leavers also did not have significant difference on the Academic Readiness factors. The only one of these

pairings that had a significant difference in only one self-efficacy factor was Good

Leavers versus Bad Leavers for Labor Performance. This self-efficacy measure found

significant differences in four groups, Notes in two, Extracuractvs in three, and

Expectation, which was found the most, in five groups.

The table below is a simple visual representation of the differential relationship

between the Academic Readiness factors, the Academic Self-efficacy items, and the three

different ways to operationalize academic success: i.e., Performance, Persistence, and a

composite measure of both Performance and Persistence. Those cells that had significant

differences are marked with an X if the significance value was .05 or less and an * if the

significance value was less than .10. The last row in the table includes the total number

of Academic Self-efficacy items that had significant differences on the different outcome

measures. The number is given for both levels of significance with the total at less than

.10 in parentheses.

Table 9

Academic Readiness and Self-Efficacy items with Significant Relationships

	Perform 4.00	Perform ± 2.25	Persist	Composite
Academic Readiness				
HS GPA	X	X	X	X
HS Percentile	X	X	X	X
ACT Composite	X	X		X
ACT English	X	X	X	X
ACT Reading	X	X		X
ACT Math	X	X		X
Self-Efficacy (SE)				
Read				
Study			*	
Intructors				
Laborprogram				
LaborPerformance				X
Papers				
Mathsuccessful		X		
Notes	X		X	X
Expectation	X			X
Concepts	X	*		
Relationship				
Studyoutclass				
Difficult			X	
Balance	X	*		
Giveup		*	X	*
Learnhard			*	
Instructorhelp				
Gradcollege	X	X	*	
Goals				*
Bcdegree				
Meetfamfrdexp				
Graduateschool				
Home	X			*
Extracuractvs				
Items Significant	6(6)	2(5)	3(6)	4(6)

In the table above, the total number of items that had significant relationships with each of the different ways to measure academic success is fairly consistent. These results do not support the hypothesis that the composite measure would result in more self-efficacy items having significant relationship with the outcome measure.

Post Hoc Analysis

The following section will present alternatives to the above analysis to investigate further the influence of creating a composite variable of Performance and Persistence. The first analysis methodology of this study was designed to replicate the measurement of Performance and Persistence as separately studied variables. As noted in the literature review chapter, this was done because most studies look at either Performance or Persistence, and if they do both, they are done separately. However, this type of analysis does not account for the possible interaction and collinearity between these two variables. Therefore, an additional two-way ANOVA was conducted to investigate the main effects of retention and GPA, as well as the interaction effects at work in relation to the Academic Self-efficacy items.

The table below shows the results of the original one-way ANOVA as reported above and the two-way ANOVA. The *p-value*s are listed for those items with a significance level of less than .10. The last column of the table gives the total number of items with significance of less than .05 and then in parenthesis the number of items with significance less than .10.

Table 10

Self-efficacy items by Performance and Persistence Comparting Original Analysis with Two-Way ANOVA

	Original Analysis				Two-way ANOVA		
	Perform 4.00	Perform ± 2.25	Persist	Comp.	Perform ± 2.25	Persist	Persist/ Perform
Read							
Study			.06			.023	
Instructors							
Laborprogram							
LaborPerformance				.021		.03	.012
Papers							
Mathsuccessful		.014			.029		
Notes	.023		.002	.042		.007	
Expectation	.005			.021		.009	
Concepts	.005	.053			.051		
Relationship							
Studyoutclass						.063	
Difficult			.033			.008	
Balance	.02	.082				.093	
Giveup		.064	.008	.069		.022	
Learnhard			.071			.016	
Instructorhelp						.012	
Gradcollege	.044	.027	.057				
Goals				.09			
Bcdegree							
Meetfamfrdexp					.071		
Graduateschool							
Home	.004			.034	.015	.011	
Extracuractvs							
Items Significant	6(6)	2(5)	3(6)	4(6)	2(4)	9(11)	1(1)

The two-way ANOVA resulted in an increased number of self-efficacy items that were related to Retain: 3(6) versus 9(11) over the one-way ANOVA. Gradcollege was the only item that was significant under the original ANOVA but not under the two-way ANOVA.

The number of items with significant relationships with Performance remained fairly consistent between these two approaches: 2(5) versus 2(4). However, three of the original 5 items were not significant in the two-way ANOVA and two new items were identified. There was only one item that had a significant interaction effect: Instructors. This item was not originally significant in either of the Retain or Performance one-way ANOVAs. However, it did have a significant main effect on Retain in the two-way ANOVA.

HS GPA as a Covariate

As reported above, high school GPA was strongly related to Persistence and retention both as individual variables and as the composite variable. Therefore, a regression analysis was conducted between high school GPA and the self-efficacy items to determine what relationship might exist between these items. Those items with significant relationships might then be suspect of influencing the predictability of the self-efficacy items to the outcome measures. The results are included in the following table.

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Table 11

Significant Relationship between High School GPA and Self-Efficacy Items

	HS GPA
Read	
Study	
Intructors	
Laborprogram	
LaborPerformance	.081
Papers	
Mathsuccessful	.087
Notes	
Expectation	.066
Concepts	
Relationship	<.001
Studyoutclass	.002
Difficult	.019
Balance	.041
Giveup	
Learnhard	
Instructorhelp	
Gradcollege	
Goals	
Bcdegree	
Meetfamfrdexp	
Graduateschool	
Home	.038
Extracuractvs	<.001
Items Significant	6(9)

The analysis showed that high school GPA was significantly correlated with nine of the self-efficacy items. This, in addition to high school GPA being a strong predictor of college retention and Performance, three Analysis of Covariance (ANCOVA) tests were conducted separately between retention, Performance, and the composite variable while controlling for HS GPA (replicating the original analysis). A two-way ANCOVA was also conducted between Persistence and Performance and the self-efficacy items while controlling for HS GPA to investigate the main and interaction effects. The results of these tests are found in the following table.

Table 12

Significant Relationships with Self-Efficacy Items while Controlling for High School GPA

	One-way ANCOVA				Two-way ANCOVA		
	Perform 4.00	Perform ± 2.25	Persist	Comp.	Perform ± 2.25	Persist	Persist/ Perform
Read							
Study			.057			.017	
Intructors						.08	
Laborprogram							
LaborPerform			.073	.027		.021	.014
Papers							
Mathsuccessful	.05	<.001		.01	.001		
Notes	.016	.086	.001	.02		.005	
Expectation	.049		.08	.046		.007	
Concepts	.006				.086		
Relationship			.019			.094	
Studyoutclass	.09		.047			.037	
Difficult			.005	.051		.004	
Balance						.047	
Giveup	.031	.076	.005	.057		.019	
Learnhard			.034			.01	
Instructorhelp			.041			.012	
Gradcollege	.014	.006	.032	.053	.044		
Goals							
Bcdegree							
Meetfamfrdexp					.056		
Graduateschool						.061	
Home	.003		.056	.072	.058	.008	
Extracuractvs							
Items Significant	8(8)	2(4)	10(12)	4(8)	2(5)	12(14)	1(1)

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After controlling for HS GPA, more items were significantly related to Retention, in both the one-way and two-way analysis, versus when HS GPA was not controlled. In the original analysis, Retention, when measured by itself, had six significant items and when HS GPA was controlled, it increased to 10 items that were significantly related. The two-way ANCOVA results for Retention saw an increase, from 10 to 13 over the one-way ANOVA. Performance as a dichotomous variable remained somewhat the same and as a continuous variable it increased by two items, from six to eight. Similarly, the composite variable increased from six to eight items.

Further Sample Analysis

A review of the data revealed that 20 of the 1,070 subjects had no variation in how they responded to all of the Academic Self-efficacy items and an additional 51 who did not vary on their responses to the final 12 of the 24 items. The 71 total subjects reflect 6.6 percent of the total sample. A chi-square test for homogeneity revealed that these 71 subjects had a significantly different proportional representation among the five composite groups ($\chi^2(4) = 10.42$, $p = .034$). The standardized residuals and item analysis showed that Good Performing Stayers were significantly underrepresented among those with no variation on their responses to the final 12 items and Early Leavers were significantly overrepresented.

Table 13 gives the number and relative percentage of subjects in each of the composite variable groups of those who had variation on the final 12 items and those who did not.

Table 13

Composite Group Membership With and Without Variation on the Last 12 Self-Efficacy Items

	Some Variation		No Variation	
Good Performing Stayers	712	70.30%	40	56.30%
Good Performing Leavers	65	6.60%	6	8.50%
Early Leavers	37	4.10%	7	9.90%
Bad Performing Stayers	104	10.70%	11	15.50%
Bad Performing Leavers	81	8.20%	7	9.90%
Total	999		71	

Based on this analysis, an assumption was made that this lack of variance reflected a lack of engagement in the survey and unreliable data. Therefore, these 71 subjects were removed and the analysis of the difference between the different methods of defining student success was conducted again. Of note is that when the group with only one item rated differently on the final 12 items was analyzed, the group proportions were nearly identical to that of the overall population.

A two-way ANCOVA was then utilized on the modified data to determine again the main and interaction effects of retention and Performance. Additionally, an ANCOVA was performed with the composite variable. In both of these procedures, the influence of high school GPA continued to be controlled.

The following table provides the *p*-values for those self-efficacy items that had significant relationships with Performance and Persistence as measured in a two-way ANCOVA and controlling for high school GPA after the 71 subjects who did not have any variation in the final 12 self-efficacy items. The table also shows the significant relationships between the composite measure and the self-efficacy items in a one-way ANCOVA.

Table 14

Significant Relationships with Self-Efficacy Items while Controlling for High School GPA after Removing Subjects with No Variation among Final 12 Self-Efficacy Items

	2-way ANCOVA			ANCOVA
	Perform ± 2.25	Persist	Persist/ Perform	Composite
Read				
Study		.007		.066
Intructors		.047		
Laborprogram				
LaborPerformance		.018	.022	.023
Papers				
Mathsuccessful	.004			.026
Notes		.003		.003
Expectation		.004		.031
Concepts	.072			
Relationship		.088		
Studyoutclass		.024		
Difficult		.022		.019
Balance		.026		
Giveup		.014		.034
Learnhard		.006		.098
Instructorhelp		.008		
Gradcollege	.051			.052
Goals				
BCdegree				
Meetfamfrdexp	.054			
Graduateschool		.047		
Home	.047	.004		.039
Extracuractvs				
Items Significant	2(5)	13(14)	1(1)	7(10)

The removal of the 71 subjects further increased the number of self-efficacy items that were significantly related to Persistence and Performance. The Persistence outcome variable rose to 14 items with significant differences versus 13 in the previous analysis and six in the original analysis. The composite variable increased to 10 items with significant relationship versus six in the original analysis. The interaction effect between Persistence and Performance remained the same, with one item with significant difference. The interaction effect had a significant difference with a different self-efficacy item in each of the other three analyses.

Conclusion

This chapter presented the analysis of the data to determine whether defining academic success simultaneously with Performance and Persistence in a composite variable influences the self-efficacy items versus using Performance and Persistence separately. As summarized in Table 9, the number of self-efficacy items was nearly the same across the three different types of analysis. In response, a series of post hoc analyses were conducted in order to explore whether different methodologies would influence the use of Performance and Persistence outcome measures. These methodologies did result in an increase in the number of self-efficacy items that had significant difference.

Chapter Five

Discussion

The purpose of this study was to explore the influence of being more exact in defining academic outcomes to more closely reflect the nature of student's experience and not to group students with different experiences together. Realizing this goal would not only help in the research setting to reduce spurious results, it would also help in practice to better target interventions and support to specific student populations.

Therefore, this study explored whether modifying how academic success is defined influences its relationship with academic self-efficacy. This approach follows a line of research that began in 1959 and extending to the early 1970s. However, very few studies have used this method in the last 30 years.

In order to explore this question, three methods of defining academic success were compared: Performance alone, Persistence alone, and a composite variable that accounted for Performance and Persistence together. This composite variable was developed by first grouping subjects into two categories based on their cumulative GPA being either "good" (greater than 2.25) or "bad"(less than 2.25). This dichotomized variable was then combined with information on whether the student had "stayed" or "left" the institution. The result was that students were classified in one of the following groups: Good Performing Stayers, Bad Performing Stayers, Good Performing Leavers, Bad Performing Leavers, or Early Leavers (those students who left the institution before receiving any final grades).

The current chapter will review the results, including the post hoc analysis in terms of the original hypothesis to determine the efficacy of this method of categorizing student outcomes. Additionally, alternative explanations for the results as well as suggestions for future research will be given.

Interpretation of Results

The research question of this study explored whether a composite variable would give rise to more significant relationships with academic self-efficacy items than using Performance and Persistence measures independently. The results did not support this supposition. Of the 24 self-efficacy items, Persistence had a significant relationship with three, Performance with two and the composite variable with four in the original analysis. Even when increasing the *p*-value ceiling to .10, Persistence had six, Performance had five, and the composite measure had six significant relationships with self-efficacy items. This result was unexpected, given the results from the pilot study, and possible reasons are discussed below.

The recruitment of the subjects was much different in the pilot study than it was in this study. Participation in the pilot study was completely voluntary. Incoming students were emailed a link to the survey the week prior to the beginning of their first term; they were asked to complete it, if possible. Of the 406 incoming students in that year, 180 (44.3 percent) completed the survey. The students in this current study were presented with the survey as part of their on-line orientation. All students had to at least click through the survey in order to move to the next section of the orientation. While students were not required to complete the survey, the approach was much more

coercive. The self-selection aspect in the pilot study could have resulted in different results because of this voluntary response bias.

Additionally, while the students were given the option and the directions on how to skip the survey, very few did. Therefore, the personal engagement in the survey may have been low. Over-incentivizing or obligating subjects to participate can introduces a bias where subjects are more motivated to complete the survey quickly than to give thoughtful, honest answers. That said, the overall survey concluded with three open-ended questions asking what the students were excited about, what they were concerned about, and if they had any other comments. While in-depth analysis was not performed, the institution reported that 93.8 percent of the students responded to the first open-ended question; 87.8 percent to the second, and 30.6 percent gave comments in the third. This perhaps is an indication that a majority were engaged in the survey. An area for future study is whether the 71 subjects who did not have any variation in their scores and were removed from the dataset in the post hoc analysis are the same as these who did not leave any comments on the open-ended questions.

Future research could further analyze the difference in responses and outcomes for those students who gave comments and those who did not in order to help determine who should remain in the dataset. This might also be a marker for those students with a specific kind of risk factor; the institution could use this information in order to target services to address these concerns.

It is recommended that future surveys include reverse scored items and other mechanisms to determine the level of engagement or honesty in the survey. These

answers could provide an internal reliability measure and those subjects who do not meet a set threshold could be excluded from the analysis or analyzed separately as a group. The data in the current study provide evidence that those subjects who have no variation and were likely not engaged in the survey were more likely to be Early Leavers. This could be a source of information for the institution to intervene with the students either to help them address those issues or to help them find alternative options for their future.

The composite measure's subgroup differences between those students who seemed engaged in the survey and those who did not, provide evidence that these groups are different in their outcomes. Those students who did not have any variation among their responses to the self-efficacy items were proportionally overrepresented as Early Leavers. It may be that such a survey is important not for its answers but for its engagement, in identifying those students at risk for leaving in their first term.

Furthermore, while the lack of variation among the 71 or 6.6 percent of respondents is evidence of their lack of engagement in the survey, it is difficult to argue that the lack of engagement was limited to these students and that excluding them from the analysis resolved these issues. There is, however, some indication from the post hoc analysis that the rest of the data acted in a more theoretically and empirically anticipated manner.

Another challenge to the data is that some of the Self-Efficacy items were negatively related to academic performance, which was theoretically and empirically unexpected. One explanation is that while having separate definitions, Self-Efficacy and

Confidence are in some ways very difficult to separate. The negative relationship between some of these items might reflect of over-confidence rather than high self-efficacy.

If incoming students report a high degree of certainty that they will be able to "perform and accomplish key expectations and responsibilities needed to be successful in college" (paraphrased from the sentence stem used in the actual self-efficacy survey), it could be interpreted as a cause for concern as an indication of a lack of appropriate and motivating fear. This is particularly true for low-income and first-generation students who might not have had access to individuals with whom they identify who have been successful in completing higher education. This, according to Bandura (1977), is an important mechanism for developing self-efficacy. The question is whether this current research methodology and survey appropriately tease out this concept.

Another possibility is that the survey does not measure self-efficacy. There does seem to be a fine line between self-efficacy and confidence. The high scores on the self-efficacy items reflect a level of over-confidence and naiveté about college. In this case, high scores on the self-efficacy items would be a risk factor for academic success. It is also likely that there is such a thing as fragile self-efficacy, which would crumble at the first sign of challenge.

In this respect, having the survey prior to the students' arrival on campus might not be the most appropriate timing. Perhaps students need the context of having attended some classes before they can truly assess themselves. The context is important. If one does not have a context, can he or she truly determine the likelihood of success?

The difficulty with this last argument is that this survey followed the best practices for self-efficacy studies. The sentence stem was identical to that recommended by Bandura (1980, 2006); the language of the items followed the recommendations.

Some argument can be made that due to the study using a 0-10 scale rather than a 0-100 scale it resulted in less differentiation between subjects. The 0-100 scale was used in the pilot study at the recommendation of Bandura. It was changed to a 0-10 scale because the pilot subjects did not use the full range of the scale and overwhelmingly limited their response to the "10s." Additionally, some pilot respondents expressed confusion on the scale.

Another area requiring further study stems from the fact that many of the self-efficacy items, including those with statistically significant results, were positively related to retention, but were negatively related with Performance. While these results are difficult to interpret, they do provide support for the argument that Performance and Persistence are 2 different and important outcomes and are not simply interchangeable definitions of academic success. If this is true, then they should not be treated as such in the literature.

More work is also needed to ensure that the different items on the self-efficacy survey are independent from each other. In some respects, there was an assumption that each of the 24 items was different and were not interrelated. There was also an assumption that the self-efficacy items were important to ultimate success.

Due to the lack of results supporting the hypothesis, a series of additional tests were conducted. The original analysis examined Performance and Persistence

separately, which is typical in current research and practice. The composite variable was proposed because it offered a feasible way to describe the different experiences of students. One of the limitations of examining Performance and Persistence separately is that it only looks at the influence of the individual variable without accounting for any interaction between the two. This approach does not distinguish between the influences of the interaction of the variables with each other and each one's additive or subtractive influence on each other.

When Performance and Persistence are examined as two separate and distinct variables, the assumption is that any relationship is based only on that individual item and not any residual relationship with the other variable. However, we know that this is likely not the case, as academic performance is highly related to retention. In the dataset of this current study, the average GPA of those who were retained was a 3.5 while those who were not retained was a 3.2 (F (1,981) = 40.5, p < .001). It would therefore be expected that any relationship with Performance would change depending on the Persistence of the student. Thus, it would be important to look at the interaction consequence of these two variables.

Additionally, in order to explore how self-efficacy relates to Performance outside of its relationship with Persistence and vice versa, a two-way ANOVA was performed. This analysis revealed that while only one self-efficacy item was related to the interaction effect of Performance and Persistence, the analysis did increase the number of items that were significantly related to Persistence. Additionally, there was a slight increase in the number of items related to Performance. This implies that the influence of

Performance on Persistence was mediating many of the items' relationship with Persistence. Persistence, in and of itself, without the influence of Performance, was revealed as an important outcome measure for Academic Self-efficacy.

The ANCOVA results then took these results to the next level by controlling for the influence of students' previous academic achievement. This allowed the examination of Performance and Persistence while controlling for high school GPA. Again, in this analysis, more self-efficacy items were related to the outcome measures, with the largest changes coming to Persistence and the composite measure.

Conclusion

In this study, I have explored whether defining student success using Performance and Persistence concurrently versus separately increases the number of statistically significantly related self-efficacy items. The purpose of this work was to explore how defining student success influences the ability of research to uncover those student attributes that are related to success and to do so in such a way that would be useful to practitioners in order to develop targeted interventions. The research sought to explore a method for defining an outcome variable that more accurately reflects the different populations of students. Almost all student success literature uses either performance (GPA) or persistence (retention) as the primary outcome measures. However, as discussed in the literature review, very few recent studies have brought them together.

While the initial results did not support the expectation that the composite variable would result in increased efficacy, the post hoc exploratory analysis provides

encouragement and direction for future research. The results, taken together, support the argument that Performance and Persistence should be considered together when conducting higher education outcomes research. The interaction and the unique contribution of these measures should be accounted for in order to gain the best and most accurate understanding of the influence and relationship with other variables.

Institutions should be encouraged to supplement the current standard methods of reporting student outcomes to reflect student performance and persistence. This will help the institution gain a better of understanding of their student and to guide specific interventions.

This study should also guide institutions to develop interventions and transition programming toward specific populations of students. At the base level, institutions should recognize that some students leave prior to the end of their first term. There might be specific interventions developed to help potential Early Leavers to either address the issues causing them to leave or to make changes in the institutional admissions or student decision-making process. Similarly, institutions should recognize that not all students who leave do so when they are performing badly rather than assuming students whose GPA is satisfactory will automatically stay at the institution.

Given that these measures are readily available and that they represent different aspects of student success, it seemed reasonable to bring them together into one composite measure. Clearly, neither Performance nor Persistence completely describes the student experience. Neither measure is a satisfactory proxy but they have been convenient proxies for student success. However, it is also acknowledged that, even

together, Performance and Persistence do not completely describe student success or failure.

It can be argued that student success is incompletely defined by Performance and Persistence. Certainly students leave for multiple and different reasons as has been discussed by a number of researchers included Clifford Adelman (2006) and Dorothy Knoell (1966), who provided some of the original direction for this current study. Adelman has used the term "Swirler" to reference those students who attend multiple institutions in order to pursue their personal and/or curricular needs (Adelman, 2005). When these students leave a given institution, it is not because of a lack of success on the students' part but as an intentional and positive decision. Additionally, neither Performance nor Persistence address whether the student is actually learning anything in the experience. Student learning outcomes, while an important part of higher education curriculums and accreditation, are very difficult to measure both intra- and inter-institutionally. Thus, they are not often included in higher education research on those attributes related to student success.

Graduation is another measure that should have some bearing on the definition of student success. While it is more often seen in higher education research, the length of time that it takes to adequately measure the result is a disincentive to researchers and practitioners who are interested in measuring the effectiveness of a given intervention or to determine the influence of a current variable. Lastly, Performance and Persistence do not address what the student might be gaining outside of the classroom. For these

reasons, it is likely that Performance and Persistence will continue to be used in higher education research.

In order to bring Performance, a continuous variable, and Persistence, a discrete variable, together into one composite categorical measure, Performance was dichotomized into two groups: good and bad Performance. This two-level variable was then combined with Persistence to create five possible groups: Good Leavers, Good Stayers, Bad Leavers, Bad Stayers, and Early Leavers.

One of the purposes of this current study was to provide a mechanism to define student success in such a more comprehensive way to include both Performance and Persistence and to do so in such a way that would be "doable" for institutions. Even though Performance is on a fixed scale of 0 to 4.0, the number of possible combinations of Performance and Persistence is far more than what would be practical to develop distinct categories of success. The usefulness of developing a composite variable is in being able to separate students in categories that could be specifically studied and for whom programs could be targeted to address their specific needs. One could easily imagine targeted programming to students who are potential high performing leavers or who are low performing stayers. However, once the groups become less distinct as more levels of the Performance variable are used, it gets harder to understand their utility.

While simple labels like "Good Leaver" or "Bad Stayer" are helpful in conceptualizing the difference in the experience and nature of different groups of students, the process of dichotomizing continuous variables may, in itself, introduce bias into the data, as well as bring with it other statistical challenges (Irwin & McClelland,

2003; MacCallum, Zhang, Preacher, & Rucker, 2002). Specifically, dichotomizing results in the loss of statistical power at a level akin to reducing the sample size. Additionally, it may result in spurious results and a lack of reliability (Dawson & Weiss, 2012) .

MacCallum et al. (2002) provide information on a few situations where dichotomization are appropriate. This includes those situations where there is a "clear scale point that differentials the classes" and where the data distribution is exceptionally skewed (p. 38). Neither was the case in the current study. In fact, previous institutional research had not been able to identify a distinct GPA level where there was a marked difference in retention rates. The distribution of cumulative GPA was also fairly normal.

One challenge for future studies that undertake this problem and want to use student categories is to determine how many categories or GPA levels to use. In the extreme, a 4.00 GPA scale gives 400 different levels and combined with Persistence, there would be 800 different categories of groups if each of these levels were viewed in categorical or ordinal manner. How many of these 800 would be meaningful? There are undoubtedly more than two levels of Performance. The question is how many levels are useful.

It is perhaps a question that could be addressed through Extreme Groups Approach (EGA) where only those with high or low Performance are examined and those in the middle are excluded from the analysis (Preacher, Rucker, MacCallum, & Nicewander, 2005). However, this method is not without its own challenges that are similar to dichotomizing as it restricts the data range. EGA might provide a method of comparing those students whose experience is categorically different by multiple

degrees in a way that is preferable to dichotomizing at a set point where individuals on either side of the line are actually very similar but are treated as very different (Altman & Royston, 2006).

The different needs of research versus practice are at the core of the discussion of whether to retain variables at the continuous level or to modify them into categorical variables (Altman & Royston, 2006; MacCallum et al., 2002). To maintain the power of Performance as a continuous variable is undoubtedly better from a research perspective. However, in practice having distinct categories that come from making categorical variables makes the different populations simpler to conceptualize and to develop target services.

The next steps should include replicating the exploratory analysis of this study and to controlling for high school GPA and/or other Academic Readiness measures. Other potentially related measures that should be explored include first generation status and low-income students in samples with a broader range of financial backgrounds.

Additionally, this research should encourage others to reexamine previous academic success studies that used Performance or Persistence in isolation as the outcome measure. In particular, the results may spur further investigation of those studies of non-cognitive variables and of variables that appeared not to have a significant influence on retention alone. Researchers and practitioners should be encouraged to consider the complexity of the student experience when designing studies and when developing interventions to address student success.

Appendix A: Incoming Student Survey

Now that all of the admissions decisions are over – no more interviews, essays, and recommendations – we would like to learn more about you without the pressure of whether you are going to get into Berea or not.

Please complete the following survey, which asks about your expectations of Berea and college life. We will use this information to help plan our orientation and first year programming. We will also use this information in our adviser training and we will share the results with your adviser to help your academic advisor know more about you.

Additional survey information

At times in this survey you will be asked to rate your degree of confidence by recording a number from 0 to 100, where 0 reflects your belief that you cannot do something at all and 100 reflects your belief that you absolutely can do it. Use the numbers between 0 and 100 to reflect your level of confidence between these two extremes.

Cannot do at all	Moderately certain can do it	Highly certain can do it
0	50	100

Example:
Arrive to my classes on time and prepared ~ Rating: 85

In this case, the 85 represents a fair degree of certainty that you will meet the expectation that students should be on time and prepared for classes in order to do well at Berea College.

While we really hope that you will take this short survey, it is your choice whether to take it or not. If you choose not to complete the survey, you must open the survey and click "next" at the bottom of each page and "done" on the last page in order to move on to the next stage of *Berea Connections*. You will get credit for completing this survey regardless of whether you answered the questions or not.

Please be assured that your answers will be confidential and will only be made available on an individual basis on an academic need to know basis under the Family Educational Rights and Privacy Act (FERPA). If you have any questions, please do not hesitate to call the Office of Academic Services at 859 -985-3237.

Using the following 4.0 point scale, what Grade Point Average (GPA) do you expect to earn in college?

A	4.0	B	3.0	C	2.0	D	1.0
A-	3.7	B-	2.7	C-	1.7	D-	0.7
B+	3.3	C+	2.3	D+	1.3	F	0.0

[   ]

How does your expected college GPA listed above compare to your high school GPA?

◯ Much Higher

◯ Somewhat higher

◯ The same

◯ Somewhat lower

◯ Much lower

What grades do you expect to earn in your _first term_?

◯ All A's

◯ A's and B's

◯ Mostly B's

◯ B's and C's

◯ Mostly C's

◯ C's and below

Using a scale from 0 to 100, rate how certain you are that you will receive these grades in your first term?

[   ]

When thinking about all <u>other students</u> overall, how do you believe high school grades relates to college grades?

◯ College grades are <u>Much Higher</u>

◯ College grades are <u>Somewhat Higher</u>

◯ College and high school grades are about the <u>Same</u>

◯ College grades are <u>Somewhat Lower</u>

◯ College grades are <u>Much Lower</u>

How do you think <u>your</u> college grades will compare to <u>your</u> high school grades?

◯ College grades will be <u>Much Higher</u>

◯ College grades will be <u>Somewhat Higher</u>

◯ High school and college grades will be about the <u>Same</u>

◯ College grades will be <u>Somewhat Lower</u>

◯ College grades will be <u>Much Lower</u>

Using a scale from 0 to 100 rate how certain you are of your answer to the above question?

[ ]

Think about the amount of effort that was required in high school. How much effort do you expect you will need to expend <u>in college</u> to get the grades you anticipate?

◯ <u>Much More</u> in college

◯ <u>Somewhat More</u> in college

◯ <u>The Same</u> in college as high school

◯ <u>Somewhat Less</u> in college

◯ <u>Much Less</u> in college

Using a scale from 0 to 100 rate how certain are you that you will be able extend the required effort?

[ ]

Please answer the following questions about your expectations of academic life at Berea.

On average, how many pages of reading do you expect to have for each of your classes per week? [ ]

What will be the average length of a "term" paper? [ ]

How many books will you read in a typical introductory class? [ ]

How many times per term will you visit your instructor in his or her office outside of class? [ ]

Adding up to 24 hours, on average how much time do you expect to spend on the following activities during a weekday?

Going to class [ ]

Working in your labor position [ ]

Sleeping [ ]

Eating [ ]

Leisure time [ ]

Studying [ ]

Exercising [ ]

Please use the scale below to indicate the extent to which the following statements about personal social support are applicable to you.

	Definitely not - 0	1	2	3	4	5	6	7	8	9	Definitely yes - 10
I do not feel generally supported to go to college. In fact, there are people in my life who oppose my decision.	○	○	○	○	○	○	○	○	○	○	○
The people around me do not care whether I attend college or not.	○	○	○	○	○	○	○	○	○	○	○
I have some support to be in college but it is limited.	○	○	○	○	○	○	○	○	○	○	○
I have great support from those around me.	○	○	○	○	○	○	○	○	○	○	○
I feel support from those around me but sometimes the pressure can be a lot.	○	○	○	○	○	○	○	○	○	○	○
I feel a great deal of pressure to be successful at college and this often causes me to feel overwhelmed with stress.	○	○	○	○	○	○	○	○	○	○	○

Please use the scale below to indicate the extent to which you agree with the following statement about intelligence.

	Definitely disagree- 0	1	2	3	4	5	6	7	8	9	Definitely agree- 10
You can learn new things, but you can't really change your basic intelligence.	○	○	○	○	○	○	○	○	○	○	○

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Please rate how certain you are that you will be able to perform and accomplish the following expectations and responsibilities in order to be successful at Berea.

Rate your degree of confidence by recording a number from 0 to 100, where 0 reflects your belief that you cannot do something at all and 100 reflects your belief that you absolutely can do it. Use the numbers between 0 and 100 to reflect your level of confidence between these two extremes.

Cannot do	Moderately certain	Highly certain
at all	can do it	can do it
0	50	100

Example:

Arrive to my classes on time and prepared

Rating: 85

In this case, the 85 represents a fair degree of certainty that you will meet the expectation that students should be on time and prepared for classes in order to do well at Berea College.

How certain are you that you will be able to perform and accomplish the following expectations and responsibilities in order to be successful at Berea?

Keep up with required class reading [ ]

Understand class reading [ ]

Use effective study strategies [ ]

Understand expectations of the instructors [ ]

Understand the expectations of the labor program [ ]

Be successful in classes that are writing intensive [ ]

Perform adequately in your labor position [ ]

Write college-level papers [ ]

Be successful in math classes [ ]

Taking notes that will help you to learn and pass your classes [ ]

Meet the expectations you have of yourself [ ]

Master the skills taught in your classes [ ]

Understand the concepts taught in your classes [ ]

Devote sufficient study time outside of the classroom to be successful in your courses [ ]

Develop mutually supportive relationships with other students [ ]

Study outside of class at least 2 hours for every one hour of class time [ ]

Figure out how to do the most difficult class work by asking others for help [ ]

Balance labor, academic, and personal time [ ]

Not give up when school gets difficult [ ]

Understand expectations of labor supervisor [ ]

Learn class material, even if the work is hard [ ]

Ask for help from instructors [ ]

Graduate from college [ ]

Demonstrate a strong work ethic [ ]

Reach your academic goals [ ]

Earn a degree from Berea College [ ]

Meet the expectations of your family and friends regarding getting a degree [ ]

Going to graduate school after earning your undergraduate degree [ ]

Feel "at home" in Berea [ ]

Be involved in extra-curricular activities such as choir, debate, campus clubs, sports, service. [ ]

What most excites you about coming to Berea College?

What academic concerns do you have about going to college?

What other concerns (not just academic) do you have about going to college?

What are you most looking forward to learning in college?

Thank you for completing the survey. Please be aware that once you click the **"Done"** button below, you will not be able to reenter the survey. If you have any questions, please do not hesitate to call the Office of Academic Services at 859-985-3237.

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Professional positions held

Director of Academic Services,
Berea College, Berea, KY, June 2007 - Present

Associate Director, Student Educational Opportunity,
University of Wyoming, Laramie, WY, 2005 - 2007

Project Director, Student Support Services (SSS),
University of Wyoming, Laramie, WY, 2001 - 2005

Project Director, TRIO Dissemination Partnership Program,
University of Wyoming, Laramie, WY, 2000 - 2003

Coordinator, Academic Services,
University of Wyoming, Laramie, WY, 1999 - 2001

Retention Specialist, Student Support Services,
University of Wyoming, Laramie, WY, 1998 - 1999

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Research Coordinator, Wyoming Human Services Training Institute,
University of Wyoming, Laramie, WY, 1993 - 1995

Scholastic and professional honors

Berea College Student Government Association (SGA)
Service to Students Award, 2013

University of Michigan, Bentley Historical Library
Bordin-Gillette Researcher Travel Fellowship, 2012 for archival research of late
Congressman William Ford's papers related to the history of the TRIO programs
and the Higher Education Act.

Pell Institute for the Study of Opportunity in Higher Education
Research Support Grant, 2013

Golden Key National Honor Society
Member, 2010

Phi Kappa Phi
Member, 2001
University of Wyoming

Public Administration Elwood Mead Book Award for Academic Achievement,
2001

Psi Chi - National Honor Society in Psychology
Member, 1988
University of Wyoming chapter President, 1989-1992

Council for Opportunity in Education (www.coenet.us)
Treasurer & Executive Board member, 2006-2008
National Board member, 2002-2008
Finance committee member, 2004-2008
Investments Subcommittee, Grants Subcommittee – 2004- 2008
Strategic Planning committee, 2002-2008
International Access committee, 2002-2008 – Chair, 2003-2004

ASPIRE – Regional TRIO professional association
Regional President, 2003-2004
Wyoming Chapter President, 1999-2000
Board member, 1999-2000 & 2002-2006
Leadership and Professional Development Chair 2000-2003
Finance, Personnel, and Strategic planning committees

Solid Rock Outdoor Ministries
Board member, 2002-2005