

Old Dominion University

## ODU Digital Commons

---

Educational Foundations & Leadership Theses  
& Dissertations

Educational Foundations & Leadership

---

Fall 12-2022

# Combining Cognitive and Noncognitive Assessments to Predict First Year GPA and Persistence in Community College Students

David Harris Larman

*Old Dominion University*, [d\\_lerman@yahoo.com](mailto:d_lerman@yahoo.com)

Follow this and additional works at: [https://digitalcommons.odu.edu/efl\\_etds](https://digitalcommons.odu.edu/efl_etds)



Part of the [Community College Leadership Commons](#), [Educational Assessment, Evaluation, and Research Commons](#), [Educational Psychology Commons](#), and the [Higher Education Commons](#)

---

### Recommended Citation

Larman, David H.. "Combining Cognitive and Noncognitive Assessments to Predict First Year GPA and Persistence in Community College Students" (2022). Doctor of Philosophy (PhD), Dissertation, Educational Foundations & Leadership, Old Dominion University, DOI: 10.25777/pjsc-n885 [https://digitalcommons.odu.edu/efl\\_etds/299](https://digitalcommons.odu.edu/efl_etds/299)

This Dissertation is brought to you for free and open access by the Educational Foundations & Leadership at ODU Digital Commons. It has been accepted for inclusion in Educational Foundations & Leadership Theses & Dissertations by an authorized administrator of ODU Digital Commons. For more information, please contact [digitalcommons@odu.edu](mailto:digitalcommons@odu.edu).

**COMBINING COGNITIVE AND NONCOGNITIVE ASSESSMENTS TO PREDICT  
FIRST YEAR GPA AND PERSISTENCE IN COMMUNITY COLLEGE STUDENTS**

By

David Harris Lerman  
B.S May 1993, University of San Diego  
M. Ed. May 2012, Virginia Commonwealth University

A Dissertation Submitted to the Faculty of  
Old Dominion University in Partial Fulfillment of the  
Requirements for the Degree of

DOCTOR OF PHILOSOPHY

COMMUNITY COLLEGE LEADERSHIP

OLD DOMINION UNIVERSITY  
December 2022

Approved by:

Dr. Mitchell R. Williams (Director)

Dr. Christopher R. Glass (Member)

Dr. Linda Bol (Member)

## **ABSTRACT**

### **COMBINING COGNITIVE AND NONCOGNITIVE ASSESSMENTS TO PREDICT FIRST YEAR GPA AND PERSISTENCE IN COMMUNITY COLLEGE STUDENTS**

David Harris Lerman  
Old Dominion University  
Director: Dr. Mitchell R. Williams

Standard assessments of cognitive ability have been the preferred method of assessing the probability of student achievement at community colleges, but there is a growing trend in the use of noncognitive factors to assess student potential. Factors related to a student's race/ethnicity and family income have been shown to be correlated with placement tests scores and high school grades. There is a gap in the literature about the use of noncognitive measures in conjunction with standardized placement tests to predict the achievement and persistence of community college students. The purpose of this study was to examine the strength of cognitive and noncognitive measures of placement to predict the achievement and persistence. The researcher used hierarchical linear regression analyses with Sedlacek's Non-Cognitive Questionnaire (NCQ), SAT or multiple measures, and demographic data as independent variables and first semester GPA and persistence to second year as dependent variables. Data were further analyzed for descriptive statistics, collinearity and normal distribution.

Noncognitive factors knowledge acquired in a field and realistic self-appraisal were positive correlated with GPA across race/ethnicity. Work hours were negatively correlated with academic success, as was placement at the lowest level through multiple measures due to low high school GPA. Results differed in some ways from previous literature, finding self-reported leadership experience negatively correlated with student persistence. It is recommended that institutional leaders promote practices and services such as flexible schedules, financial support structures, and proficiency-based pedagogy.

*Keywords:* multiple measures, noncognitive factors, NCQ, predictive analytics, assessment and placement, at-risk populations, community college students

Copyright, 2022, by David Harris Lerman, All Rights Reserved.

This dissertation is dedicated to my wife Dr. Erin Hughey-Commers who possesses an acute and delicate sense for balancing the responsibilities and opportunities in life with a healthy inclusion of wonder and laughter. When I was deeply stuck in the middle of this effort she jumped in and pulled me forward. Thank you also to my friends and colleagues at Piedmont Virginia Community College where I have worked for the last two decades plus. Without your guidance and encouragement this degree would not have occurred. Without your camaraderie and excellence PVCC would be just another community college, but because of you this place has become a very special home base to thousands upon thousands of students – and it has certainly become my second home too. Other friends, both lifelong and more recently added, have been sources of inspiration, support, and occasional voices of reason. To my son Parker, who I love above all else. Stand on my shoulders, my son, and set your goals upon a distant horizon. I would like to thank my brother Jeff, who is a mountain of stoicism and resolve, and incidentally a far better student and hiker than I. But not as funny. And to my parents, Ellen and Elliott, who have watched in horror and marveled at this educational journey – thank you. My parents, especially my mother, gave me the greatest gift they could when they taught me to love reading and to question both authority and the wider world. This educational journey and the landscape it traversed has not been a smooth one - but at least it wasn't boring.

## ACKNOWLEDGMENTS

There are so many people who have contributed to the successful completion of this dissertation. Firstly, I would like to thank my dissertation chair Dr. Mitchell Williams. Throughout this program you have been a great source of warmth and encouragement, and while thoroughly schooling me in APA styling and joyously playing devil's advocate, you never failed to solicitously inquire into the state of my rather debatable mental health. Your passion for social justice was a clear polestar; even when class discussion dwelt on large or picayune points, we students always knew we had your intellect and conscience to steer by. To my former chair and community college leadership program head Dr. Christopher Glass. Your support, encouragement, and invigorating conversations helped me continue during the occasional bumps in the road. You have been a wonderful guiding light of intellectual curiosity in conjunction with a scholar's need for rigor and a counselor's gift of empathy. When you left ODU to take on another role in Boston you did everything you could to ease the transition. Dr. Linda Bol, I'm so glad that you were my methodologist/warm human being and third committee member. From the first time I witnessed your expertise dealt out with a laugh and light hand during a summer institute class, I knew you were a person I wanted to work with more. You took a deep risk on a student with less than average math skills and I'm deeply appreciative of your courage.

Dr. Jolene Hamm is a colleague, friend, institutional researcher, and compassionate gentlewoman. Without her close personal assistance and frequent supportive injunctions, this dissertation would not only be worse, it might never have been written. Over the span of several years she was also joined in her office by Lillian Meighan and Lindsey Pilat, two other very able and compassionate souls who aided me in this quest. Old Dominion University's Dr. Kim Bullington's skills and knowledge helped me in many ways when formatting looked to be

gaining the upper hand and PVCC's own Anni Wilson lent a crucial last stage assist. Lunch bunch and redoubtable support crew Amy, Kim and Rob made sure I was fortified for the trek while peanut M&Ms played a minor but crucial supporting role. And friends strewn throughout the country did what old friends do best; they held me tight with love, the fifth and greatest fundamental force.

Thank you also to my 2015 doctoral program cohort at Old Dominion University for your camaraderie, optimism, friendship, and inspiration. That we have undertaken a wonderful program and juggled it while keeping aloft life's myriad other obligations is obvious. Less easy to discern are the shining angel wings beneath your hard-won robes. Amanda, Angela, Ann, Fancy Anne, Chris, Josh, Julie, Marcus, Pam H., and Pam Y.: I will never forget you.



## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	ix
Chapter	
I. INTRODUCTION .....	1
BACKGROUND OF THE STUDY .....	2
STATEMENT OF THE PROBLEM .....	7
THEORETICAL FRAMEWORK .....	7
RESEARCH QUESTIONS .....	9
DEFINITION OF TERMS .....	9
NONCOGNITIVE ASSESSMENT .....	10
STUDY DESIGN.....	11
SIGNIFICANCE.....	11
PROFESSIONAL SIGNIFICANCE .....	12
DELIMITATIONS .....	13
SUMMARY OF CHAPTER .....	14
II. LITERATURE REVIEW.....	16
TRADITIONAL COGNITIVE ASSESSMENTS AND PLACEMENT .....	17
PROBLEMS WITH TRADITIONAL ASSESSMENTS .....	18
MULTIPLE MEASURES .....	20
HISTORY OF NONCOGNITIVE ASSESSMENTS IN EDUCATION .....	23
NONCOGNITIVE ASSESSMENTS .....	24
FURTHER RESEARCH INTO THE USEFULNESS OF NONCOGNITIVE ASSESSMENTS .....	26
APPLICATION WITH COMMUNITY COLLEGE STUDENTS .....	28
THEORETICAL FRAMEWORK .....	29
REVIEW AND SYNTHESIS OF THE NCQ RESEARCH.....	31
THE NONCOGNITIVE QUESTIONNAIRE .....	34
CONCLUSION.....	38
III. METHODOLOGY .....	40
PURPOSE STATEMENT .....	40
RESEARCH QUESTIONS .....	41
HYPOTHESES .....	41
RESEARCH PARADIGM .....	41
SETTING.....	42
PARTICIPANTS .....	43
VARIABLES .....	44
RESEARCH INSTRUMENT .....	44
RELIABILITY AND VALIDITY .....	45

DATA COLLECTION PROCEDURES .....	46
	Page
SCORING THE NCQ.....	47
DATA COLLECTION .....	48
HUMAN SUBJECTS PROTECTION .....	49
DATA ANALYSIS.....	50
LIMITATIONS.....	53
CONCLUSION.....	53
 IV. RESULTS .....	 54
DESCRIPTION OF THE PARTICIPANTS .....	54
ANALYSIS OF RESEARCH QUESTION ONE.....	56
ANALYSIS OF RESEARCH QUESTION TWO.....	59
ANALYSIS OF RESEARCH QUESTION THREE.....	60
ANALYSIS OF RESEARCH QUESTION FOUR .....	62
SUMMARY .....	66
 V. DISCUSSION .....	 68
PURPOSE STATEMENT AND RESEARCH QUESTIONS .....	68
SUMMARY OF METHODOLOGY.....	69
SUMMARY OF RESULTS .....	71
DISCUSSION.....	76
FINDINGS RELATED TO THE LITERATURE.....	78
RECOMMENDATIONS FOR PRACTITIONERS AND LEADERS .....	81
SUGGESTIONS FOR FUTURE RESEARCH.....	85
CONCLUSION.....	87
 REFERENCES .....	 89
A. NONCOGNITIVE FACTORS FOR DIAGNOSIS IN ADVISING NONTRADITIONAL STUDENTS (SEDLACEK, 2004) .....	104
B. ODU INSTITUTIONAL REVIEW BOARD INFORMED CONSENT FORM.....	105
C. PVCC INFORMED CONSENT FORM.....	107
D. SUPPLEMENTARY SUCCESS QUESTIONNAIRE (MODIFIED NCQ) .....	108
E. NCQ SCORING KEY .....	110
F. CORRELATION MATRIX .....	113
 VITA.....	 115

## LIST OF TABLES

Table	Page
1 VCCS Multiple Measures for Math Placement .....	21
2 VCCS Multiple Measures for English Placement .....	22
3 Descriptive Statistics of Noncognitive Variables .....	55
4 Participants by Race/Ethnicity .....	55
5 Methods of Student Placement .....	56
6 Descriptive Statistics for NCQ Items, Age, and Work Hours .....	57
7 Analysis of Noncognitive Factors on First Semester GPA.....	58
8 Percentage of Students Persisting Fall to Fall.....	59
9 Multiple Regression Analysis for Fall-to-Fall Persistence .....	59
10 Noncognitive Questionnaire Results of Multiple Regression Including Other Factors on Majority Students.....	60
11 Multiple Regression for First Semester GPA for USM Students .....	61
12 Multiple Regression for Fall-to-Fall Persistence for USM Students .....	62
13 Fall-to-Fall Persistence Predicted by the Model for USM Students.....	63
14 Multiple Regression Analysis for GPA and Persistence for White/Asian Students .....	64
15 Multiple Regression Analysis for GPA and Persistence for USM Students .....	64
16 Multiple Regression for GPA and Persistence by Race Split File USM .....	65

## CHAPTER I

### INTRODUCTION

Nearly half of the undergraduates in the United States are enrolled in community or technical colleges (Ma & Baum, 2016). Yet, only about 20 percent graduate after two years, and fewer than half obtain their stated goals (Jenkins & Fink, 2016; Mullin & Phillippe, 2013; Schuetz, 2008; Windham et al., 2014). Lack of persistence occurs for many reasons, but research indicates that high school grades and postsecondary persistence are strongly linked (Metzner, 1989; Ngo & Kwon, 2015; Trusty & Niles, 2004). Students who drop out of community colleges typically have lower pre-college achievement scores and high school GPAs than students who persist (Metzner, 1989), and these students are more likely to have been placed into remedial courses. Researchers estimate that 60 percent of students are placed into developmental coursework (Attewell et al., 2006; Bailey, 2009; National Center for Public Policy and Higher Education [NCPPE] & Southern Regional Education Board [SREB], 2010). Students who are placed into developmental or remedial coursework are less likely to graduate with a degree or certificate than students who are not (Bailey, 2009; Bailey et al., 2010; Clotfelter et al., 2015; Fong et al., 2015).

Typically, students are assessed and placed into English and math coursework via standardized test scores or another placement instrument (Scott-Clayton, 2012). Research has raised questions about the correlation of test scores with race/ethnicity and socioeconomic status (Beatty et al., 1999; Bettinger et al., 2013; Bridgeman et al., 2001; Tracey & Sedlacek, 1994). Large numbers of incoming students who do not score highly on these tests are then placed into developmental education. A disproportionately high percentage of students placed in developmental coursework are underrepresented minorities or low-income students (Crisp &

Delgado, 2014). Nearly 75% of students of Hispanic or Latino families, and 88 percent of students from African-American or Black families require a developmental course (NCES, 2018). Seventy three percent of students from families below the federal poverty level required remediation (NCES, 2018), while students who drop out of college typically have lower pre-college achievement scores and high school GPAs than students who persist (Bean & Metzner, 1985).

Some states, such as California, have long been placing students into classes based on factors including high school GPA, rank, and course completion and the model has been studied and found valid (Bahr et al., 2019). The Virginia Community College System (VCCS) began using multiple measures in fall 2017, allowing placement of students into college level coursework based on high school grades and the completion of Algebra I or Algebra II. Some four-year colleges have also begun incorporating noncognitive assessments into their consideration when assessing student applicants in recognition of the need for more diversity in the classroom (Allen, 1999; Sedlacek, 2003; Sternberg, 2004, 2015). Researchers have documented the increased predictive nature of combining cognitive and noncognitive assessments in the admissions process (Abedayo, 2008; Komarraju et al., 2013; Sternberg, 2004; Ting, 1998). The combination of cognitive and noncognitive assessments for placement remains uncommon at community colleges where such data could be used to assess the likelihood of student dropout and the positioning of assistive college resources.

### **Background of the Study**

Community college students placed into developmental coursework are less likely than their non-developmentally placed peers to complete degrees and certificates (Bailey, 2009; Bailey et al., 2010), and numerous studies have shown inaccuracies in the understanding and

application of traditional high-stakes placement tests (Melguizo et al., 2014). It has been found that many students who place into developmental also do not take the recommended courses, with some opting not to take any courses and others enrolling in non-recommended English or math courses (Jenkins et al., 2009). For many students who do enroll in developmental courses, developmental education is a cul-de-sac of no return. The large majority of students who enroll in developmental coursework never complete a degree or certificate, and many students never even complete a college level course in English or math (Hodara & Xu, 2016; Jaggars et al., 2015). The direct cost of developmental education is high, with estimates ranging from the hundreds of millions to billions of dollars annually (Ganga et al., 2018; Melguizo et al., 2014). In addition to direct costs, there are also the costs to colleges, universities, and the nation in terms of students who do not complete their education, since many students who place in developmental education do not complete college. Students without a college degree then go to take lower-income earning jobs and pay subsequently fewer taxes (Saxon, 2015).

Numerous strategies, including accelerated learning, modular based learning, and contextualized learning, have been implemented with the goal of increasing the graduation rates of students who score low on placement tests (Hodara, & Jaggars, 2014; Ngo & Melguizo, 2016). State systems (e.g., Florida, California, Colorado & Tennessee) have eliminated heretofore required developmental education courses or made them optional (Hagedorn & Kuznetsova, 2016) and, given the status of state educational budgets and current trends in developmental education, it is likely that less money as a percentage of the whole will be devoted to developmental education (Saxon, 2017). Some states and systems have turned to other approaches. The VCCS approved the use of multiple measures for student placement in fall 2018, allowing colleges to use a combination of high school GPA and the completion of high

school Algebra I or II for college placement in lieu or in addition to traditional placement tests (Virginia Placement Test [VPT] or Accuplacer). This new policy followed a study by Rodriguez (2014) which indicated that when the VCCS began using the VPT college-level math placements increased 22 percent, but passing rates in those courses declined seven percent. The use of multiple measures for placement may result in more students being placed into gatekeeper college level courses rather than developmental courses. Further, students placed via this method may do as well or better than their peers (Ngo & Kwon, 2015).

Adding an assessment of students' noncognitive assets could better predict the performance of these students, allowing colleges to implement proactive strategies to improve these students' outcomes. These methods can be broadly defined as assessments of noncognitive or psychosocial traits that encompass grit, resiliency, locus of control, motivation, and anxiety. The relationship between self-perception, motivation, attributions, and self-regulation with college achievement has been found to be positive and significant and has been especially studied related to non-majority student populations (Allen et al., 2010; Duckworth et al., 2007; Fong et al., 2017; Noonan et al., 2005; Oswald et al., 2004; Palmer & Strayhorn, 2008; Ting, 2000, 2009). The inclusion of noncognitive measures as part of the application process at four-year colleges and universities has boosted acceptance rates of minority students, which is a topic of interest to more competitive colleges looking to increase diversity (Robbins et al., 2004; Sternberg, 2012; Wilds & Wilson, 1998). Most of the research involving noncognitive factors has involved four-year college and university students, thus leaving a gap exploring the experience as it applies to community colleges. For community colleges, the dividend of a more accurate assessment and placement system is a higher graduation percentage. The four-year college student population differs from two-year college student population in many ways,

including older age, less academic preparedness, lower number of courses taken per semester, lower socio-economic status, more diverse, and working more hours (Gibson & Slate, 2010; Horn & Carroll, 1996).

Furthermore, this study addresses two other needs. First, it provides an early evaluation of the effectiveness of the new VCCS placement system based on high school GPA and course completion (i.e., multiple measures). Second, the combination of cognitive and noncognitive assessments can be looked at through the lens of social justice. If noncognitive traits can be shown as predictive for minority and/or poorer students, community colleges will have one less reason to assign these students into developmental education.

The achievement gap between dominant, well-served majority and underserved minority populations has been well documented (Bailey et al., 2005; Cook & Cordova, 2006). The term underserved minorities (USM), sometimes referred to as students of color, generally encompasses students in the educational context who are Black or African-American, Hispanic or Latino, or American Indian. The underserved student group includes not only the minority groups mentioned above but also those who first-generation or from low-income backgrounds. There is clearly overlap among the categories (i.e., a Hispanic student who is the first in his lower-income family to go to college). Specifically, there are significant differences not only between the race of community colleges students versus their four-year counterparts, but there also exists a well-known disparity between the wealth of their families (O'Connor, 2009). Not surprisingly, community college students are more likely to be from lower-income families (O'Connor, 2009; Roscigno, 1998, 2000). Many researchers have also pointed to placement tests themselves as culprit, with SAT scores correlated with family income and parental education (Kobrin et al., 2002), but not proving as predictive of student achievement for other ethnicities



(Bridgeman et al., 2003). In this regard, noncognitive assessments may act as a palliative; researchers have documented differences in noncognitive scores of minority students (Gurrin, 1999; Pascarella & Terenzini, 1991; Tinto, 1993; Tracy & Sedlacek, 1984).

Scholars have argued that children of color and children from low-income families have been diverted onto a path where they are less likely to earn a college degree and contend for positions of power and privilege in contemporary society (Brint & Karabel, 1989; Davis & Jordan, 1994; Dougherty, 1994; Roscigno, 1998; Strayhorn, 2008b). Better predictive models that combine both cognitive and noncognitive factors may help address these concerns raised. Previous research has also considered developmental assessment and placement from other perspectives. Acevedo-Gil et al., (2015) examined the experience of Latino/as taking pre-college level coursework. Using critical race theory and a validation model as framework, they found that staff and faculty operated from a deficit model, blaming the students for perceived lacks such as missing classes, poor or missing attendance, not paying enough attention, and not enough time spent doing homework. Invalidation led to the students questioning their own ability to complete the coursework, whereas validation accomplished the opposite. From the student perspective, they were trying quite hard and teacher demands were unrealistic (Mau, 1993). Perhaps the difficulty is structural, as many other studies have suggested (Crisp & Delgado, 2014; Quarles & Davis, 2017; Roscigno & Ainsworth-Darnell, 1999; Xu & Dadgar, 2018). Other research has suggested the positive influence of cooperative learning models for Native Americans or students of color (Hooker, 2011). It is clear that many factors contribute to the reasons why some students are assessed and placed differently and then do not persist to graduation.

### **Statement of the Problem**

Much research has focused on cognitive predictive factors, which are important when considering competitive admissions but not quite as relevant for community colleges with an open access mission (Allen et al., 2010; Porchea et al., 2010). For these colleges, the importance of these data is found in predicting student achievement and persistence. Gender and race/ethnicities have also been found to correlate with persistence (Ancis & Sedlacek, 1997; Huang & Brainard, 2001; Pascarella & Terenzini, 2005; Reason, 2009). Cognitive factors contributing to GPA and persistence have been much studied and researchers have been adding to the body of literature available in the application of noncognitive factors towards the same measures (Adebayo, 2008; Ancis & Sedlacek, 1997; Fuertes & Sedlacek, 1994; Noonan et al., 2005; Sedlacek, 2003, 2004; Sedlacek & Adams-Gaston, 1992; Ting, 2000, 2003, 2009; Tracey & Sedlacek, 1984). Although some research studies have combined cognitive and noncognitive measures to predict the odds of the success in certain student populations, these studies have been mostly conducted at the four-year college and universities. Little published research has addressed the combination of cognitive and noncognitive factors for the community college student. The current study filled this gap by examining how students placed by the multiple measures of high school GPA and course completion are doing when compared to traditionally-placed peers.

### **Theoretical Framework**

The conceptual framework was informed by Sedlacek's work with assessment of noncognitive factors to build a better predictive model for nontraditional students. He and his colleagues were influenced in their work by Sternberg's (1985) triarchic theory of intelligence. As attested earlier, the very nature of traditional predictive cognitive tests may be a poor match

for different types of intelligence. Previous research shows many minority groups learn better through collective learning strategies at odds with the usual approach followed by the modern school system (Ngo & Melguizo, 2015). For instance, Sedlacek (1979) found data supporting a negative relationship between traditional standardized test scores and college grades for underserved minorities. His noncognitive questionnaire (NCQ) was designed to elicit a better predictive test for underserved minority students who were often referred to as nontraditional students when the test was devised.

Sedlacek was also influenced by Astin's work on minority student achievement in college. Astin found evidence that Black students who with lower aspirations and less precise goals than other Black students were less likely to persist in school (1975) while those who could demonstrate knowledge gained through credit by examination (CLEP) were more likely to persist in college than Black students who did not take the exam (1971, 1975, 1977). And while researchers including Astin have found validity in using standardized tests to predict retention and graduation (Adelman, 1999, Astin et al., 1996; Bowen & Bok, 1998), Sedlacek (2004) contends that that these tests were not designed to relate to retention or graduation.

If the testing environment is not designed to provide evidence for the abilities of all students equally then some students are disadvantaged. In the college system, that disadvantage is evinced through improper placement into developmental education, a placement that delays and puts barriers between the student and graduation. Therefore, this study was derived from this theoretical framework and the literature on noncognitive and cognitive assessments of college students, more of which is reviewed in Chapter Two.

## Research Questions

The purpose of this study was to examine the strength of cognitive and noncognitive measures of placement to predict the achievement and persistence. The four research questions guiding this study were:

1. To what extent do noncognitive factors predict first semester GPA for community college students above and beyond cognitive factors?
2. To what extent do cognitive and noncognitive factors predict fall-to-fall persistence for community college students?
3. To what extent do cognitive and noncognitive factors predict first semester GPA and fall-to-fall persistence for underserved minority students?
4. To what extent do noncognitive factors predict first fall-to-fall persistence for community college students above and beyond other factors?

## Definition of Terms

*Grade Point Average (GPA)*: A calculated assessment of a student's performance across classes as measured by grades divided by the number of credits earned. Measured on a 0-4 scale.

*High School GPA (HSGPA)*: A calculated assessment of a student's learning in high school as measured by letter/number grades and divided by the number of credits earned. Often weighted, meaning a bonus incremental number is awarded for courses judged more rigorous so that a HSGPA might exceed 4.0.

*Multiple Measures*: Made effective in the VCCS for Fall 2017, these guidelines allowed for the placement of incoming students due to high school GPA and course completion.

*Noncognitive Factors*: Nontraditional predictors that represent behavioral, attitudinal, and personality constructs (Allen, Robbins & Sawyer, 2010). Often identified in the psychological

literature as psychosocial factors. They include personality, motivation, self-concept, attributions, and self-perception (Robbins et al., 2006).

*Noncognitive Questionnaire (NCQ):* The Non-Cognitive Questionnaire (NCQ) is a 23-item measure assessing eight noncognitive variables that are thought to predict the performance and retention of students in college. It was developed by Tracey and Sedlacek (1984) and has been since revised. It was very slightly modified by the author for the purposes of this study.

*Retention to Second Year:* Continued enrollment (or degree completion) at the same higher education institution in the fall semesters of a student's first and second year. This is to be distinguished from the standard definition of persistence, often defined as continued enrollment or degree completion at any higher education institution — including one different from the institution of initial enrollment — in the fall semesters of a student's first and second year (National Student Clearinghouse, 2016).

### **Noncognitive Assessment**

One widely-used, free, and validated test of non-cognitive measures, the Noncognitive Questionnaire (NCQ), found NCQs to be a better predictor of academic success than standardized admissions and placement tests, the SAT, or other similar high-stakes tests (Sedlacek & Adams-Gaston, 1992). The NCQ measures: positive self-concept, realistic self-appraisal, successfully handling the system, preference for long-term goals, availability of a strong support person, leadership experience, community involvement, and knowledge acquired in a field. Courts have allowed the use of noncognitive variables in admittance as a variable approach (Sedlacek, 2003). Colleges and universities that have used the NCQ for admissions include Yale, Tufts, and Oklahoma State University (Sedlacek, 2004). This is important because one of the reasons for the development of these tests was to address the score differences on the

SAT that may be due to racial and family income factors and find methods that ameliorate the differences (Bridgeman et al., 2003; Sternberg, 2004, 2012).

### **Study Design**

Quantitative design was chosen to answer the research questions (Creswell, 2009). Quantitative research can effectively shield the identity of the respondent, can often be completed quickly, and can be used to determine correlations between variables (Krauthohl, 1998). Researchers used quantitative methods, primarily multiple regression and logistic regression, to assess noncognitive variables in an attempt to predict success for college first-year students (Sedlacek, 2004). Researchers have used the NCQ because it has shown both construct and congruent validity as well as high test-retest reliability (White & Sedlacek, 1986).

Descriptive statistics will be collected for student gender, age, race, ethnicity, amount of education expected, and Pell eligibility. As a comparison, most of this same information will be assessed of the student's cohort to ensure similarity among the sample. The community college's Office of Institutional Research, Planning, and Institutional Effectiveness will assist with data collection. Descriptive statistics will also be reported for each of the eight measures on the NCQ. The research will use hierarchical linear regression analyses with Sedlacek's Non Cognitive Questionnaire (NCQ), SAT or multiple measures, and demographic data as independent variables and first semester GPA and persistence to second year as dependent variables.

### **Significance**

Four-year colleges and universities have used NCQ data to increase the diversity of their student population through admissions (Sternberg, 2012). This study adds to research with its application at an open access community college comprised of a diverse student body. This study

determined whether the NCQ results differed significantly across these dimensions not to increase diverse enrollment, but to predict and address attrition across groups.

The NCQ was administered as a part of the mandatory student orientation course to incoming program placed students at a mid-sized VCCS college. Over 700 students are typically enrolled in this orientation course, SDV 100. In addition to the NCQ scores, information was collected on the academic progress of these students through spring 2019, as defined by number of credits, GPA, and retention. Fall 2019 enrollment data was also collected. Hierarchical linear regression was selected as the analytical technique because it best matched the research questions posed by this study.

### **Professional Significance**

Forty five percent of undergraduate students in the US enroll in a community college, and their success is crucial not only to themselves and their families but also to the welfare of the country. Still, there is not broad agreement on how to increase the dismal rates of retention and persistence, nor enough focus on the assessment of noncognitive factors with community college students. The results of this study are of value to practitioners who seek to increase the likelihood of college students persisting to graduation.

The number of students enrolled at community colleges nationwide, including the VCCS, has been decreasing since 2010 (Juszkiewicz, 2017) as has the money allotted to community college systems. Numerous states have decreasing education budgets for their community colleges leading to fewer resources for those students who remain. Developmental education is under almost constant change making it difficult to assess the impact of serial revisions in placement and course delivery.

There has not yet been a study published in a peer-reviewed journal evaluating the performance of students placed via the new VCCS policy of multiple measures. The new policy was enacted based on over thirty years of research validating high school GPA as the best predictor of freshmen grades (Geiser & Santelices, 2007). This study took that research further, adding to those results a measure of incremental effectiveness of noncognitive traits. With this additive measure effective intervention programs can increase the success rate of students. Since the NCQ has been found to be particularly effective in eliminating testing bias and evaluating students of color, and since that population is growing as a percentage of those enrolled in post-high school education, this is timely data. As the NCQ has been in use for several decades it could be argued that this data is well overdue. The use of noncognitive factors may also minimize bias correlated with socioeconomic status in the SAT and standard placement tests that measure some – but not all – aspects of intelligence.

College leaders and researchers will be interested in this topic because if the combined potential of these assessments is predictive, this information will allow more accurate placement of students into the appropriate level courses, increasing graduation rates. This study also assessed the utility of the placement through multiple measures rather than the use of standardized placement tests that both preceded it and still exists. Furthermore, if analysis of this information revealed which groups of incoming students are more highly at risk, programmatic interventions can be instituted early to foster greater academic success.

### **Delimitations**

Because this study was conducted through the college's orientation course population, students who entered the college but did not take the orientation course during their first semester were not included. Likewise, because this survey was conducted during the fall



semester, students who entered the community college in the spring semester were not among those studied. Other students may have been program placed and beginning in the fall but may have had an orientation or other coursework at another college and would not be considered first time in college and thus were not included in the sample.

### **Summary of Chapter**

This chapter described the background of assessment and placement difficulties experienced in the milieu of higher education, particularly that in community colleges, and even more by students of color and low-income. Placement into developmental education brings challenges for all involved: the community, the students, and the colleges themselves; not to mention the costs experienced by the nation and state. As community colleges are disproportionately made up of at-risk populations, their subsequent lack of academic success cycles into fewer economic opportunities and less social and financial capital for their offspring, perpetuating a circle of lost opportunities. In addition to the background of the study, a description of the problem, the purpose of the study, research questions, methodology, and significance of the study were presented.

Through the application of a noncognitive assessment, the NCQ, to more standard cognitive placement tests and the new multiple measures of high school grades, English and math class completion, this study sought to add to the literature a more accurate tool for assessment and placement. Further, college personnel will be able to use the noncognitive measure results to provide more support to student groups shown to be at greater risk of dropping out. Chapter Two's literature review will provide greater depth about the multiple measures model, history and information about various noncognitive assessment models, and a review of

the challenges faced in the use of culturally appropriate standardized assessments, as well as a summary of barriers to degree attainment faced by students of color and low-income.

## CHAPTER II

### LITERATURE REVIEW

College students are assessed and placed into coursework through a variety of traditional cognitive tests. This chapter will examine those measures, along with criticism about their effectiveness, particularly for minority students. As the field of intelligence testing matured, researchers (Jensen, 1980; Brown et al., 1999), uncovered unintended sociological biases on older tests normed on upper- or middle-class white youth, along with the realization that there are multiple kinds of intelligences. The tests themselves, periodically updated and exhaustively discussed, reliably demonstrate both content and predictive validity and thus the discussion of equity in testing now centers around what is fair and right. A discussion of Sedlacek's model of noncognitive factors and how they contribute to post-secondary student success is presented as this study's conceptual framework

There has also been a growing trend among colleges and universities to use multiple measures, typically high school grades and high school course completion as predictors of student success. As this movement has shown potential other schools have begun to combine the traditional tests with multiple measures, though the field is young. Selective four-year colleges are beginning to use multiple assessments in order to diversify their student body with some researchers recommending a battery of weighted noncognitive assess specific to that purpose (Sinha et al., 2011). Recognizing the impact of inaccurate placement on students, particularly those who are underserved minorities, other non-cognitive assessments designed to predict college success have been developed. This chapter also includes a review of some of these methods, particularly the noncognitive questionnaire, and considerable detail about that device is

provided. This tool has been utilized by researchers, colleges and universities for decades and that research is synthesized in the following pages.

### **Traditional Cognitive Assessments and Placement**

Prior academic achievement and standardized tests as predictors of student persistence to graduation have been much studied and numerous studies attest to their predictive value (Allen et al., 2008). The SAT and ACT, along with high school GPA, are the most commonly used. For community college students, the ACCUPLACER developed by the College Board or COMPASS, developed by ACT Inc., exams are often used for placement (Bailey et al., 2010; Hughes & Scott-Clayton, 2011). Fields and Parsad (2012) reported the usage of these tools at 42% (ACCUPLACER) and 60% (COMPASS).

More than 60% of entering students at community colleges test into developmental level coursework, which has profound implications for persistence and achievement measures (Bailey, 2009; Ngo & Kwon, 2014). At least one quarter of community college students may mistakenly be assigned to a developmental math course, which jibes with students' perceptions. Research conducted at a southwestern community college, for instance, found that only seventy-two percent of students felt that they were placed accurately (Goeller, 2013), although another study found wide variations in the understanding and application of assessment tests (Melguizo et al., 2014). U. S. college administrators look at the more than \$7 billion dollars that developmental education has been estimated to cost annually, an estimate that does not include losses to the national economy for the delay in college work and graduation, and much research has gone into finding strategies to increase the success rate of these students (Scott-Clayton et al., 2014). It is also possible that the tests are assessing the wrong aspects of intelligence or ignoring other valuable kinds of intelligence. Thus, the results may be less a condemnation of teaching (school

systems) and learning (students), but simply and misguidedly consigning students of color to pre-college level coursework.

The Virginia Community College System (VCCS) has implemented numerous strategies to address developmental education. In fall of 2012 developmental education was redesigned into computer-based, self-paced instruction through nine modularized units, each one credit and lasting approximately five weeks. A new placement test was also implemented, the Virginia Placement Test (VPT). Both these events took place for the fall 2012 class of students while a new English redesign took place the following spring. A higher number of students then successfully completed college level math and English courses, fewer students were placed into developmental education, more students earning full-time credit (12 credits) in their first two semesters, slightly improved retention numbers (54% in 2011 and 56% in 2016), and more students graduating “on-time” (Finnegan, 2018). In the fall of 2017, a further redesign of math was rolled out and the system implemented the use of multiple measures for placement into English and math.

### **Problems with Traditional Assessments**

A number of studies demonstrate that these tests, despite their common usage, are not strongly correlated with successfully predicting student outcomes (Armstrong, 2000; Roksa et al., 2009), or not equally predictive for different socioeconomic classes, races or ethnicities (Darling-Hammond, 1994). Traditional assessments were originally normed on upper- and middle-income White students who largely did make up the college market for many years. That has long been changing; the number of students of color in higher education increased 61 percent between 1984 and 1994 (Pascarella & Terenzini, 1998). The SAT, for instance, has been found substantially valid for predicting individual course grades in college but high school GPA was a

better predictor of freshman GPA (Ramist et al., 1990). However, the SAT has also been found correlated with family income and parental education, leading to questions about the fairness of its utility. Traditional predictors of college achievement have limited validity when used to predict academic potential of non-traditional students (Burton & Ramist, 2001). For instance, Astin's (1975) seminal longitudinal study of 41,000 students demonstrated that ACT and SAT test scores contributed only marginally to the prediction of college persistence of Black students. Duran (1983) analyzed the literature around the topic of predicting Hispanic college achievement and concluded that high school GPA and admissions test scores were less predictive than for whites. A study conducted by Micceri (2010) at the University of South Florida reported:

Consistent with Micceri (2009), it appears that the use of test scores as admissions criterion for either females (from any racial/ethnic group), or underrepresented minorities (from any racial/ethnic group), negatively discriminates in favor of whites and males when viewed from the perspective of academic progress at USF. (p. 2).

Colgren and Sappington (2015) used a 2012-2013 statewide database of 145,560 Illinois high school students to determine the impact of socioeconomic status on academic performance. Results showed that students from low socioeconomic backgrounds were statistically underrepresented in AP classes (p. 28). Thus, students from higher income families took more AP classes and earned higher ACT scores compared to those in less rigorous classes (Colgren & Sappington, 2015, p. 29). The Graduate Management Admission Test (GMAT) is the most widely used assessment of potential for schools offering an MBA, yet researchers found that the addition of certain noncognitive measures to the GMAT and undergraduate grades improved their predictive success (Hedlund et al., 2005).

These studies and the related work of others led colleges to consider other measures in search of fairness and diversity. It has long been known that high school grades and rank correlate well with college performance (Schuh, 1999). Thus, a more formal method for using this valuable information in not just the admittance of students to elite institutions but the placement of students at two-year colleges seemed a fertile ground for experimentation.

### **Multiple Measures**

As recognition of these difficulties accrued, some states and systems changed their assessment and placement policies to include the use of multiple measures (Burdman, 2012). Texas, Connecticut and Florida are all examples, based largely on evidence coming from California (Ngo & Kwon, 2014). Multiple measures traditionally allow for the use of such predictors as high school GPA, rank, and course completion in the placement of students. Researchers have shown that high school GPA is highly predictive of success in college, while others have found course completion a useful measure (Belfield & Crosta, 2012; Scott-Clayton, 2012). The rigor of high school work has also been shown as positively correlated with college performance (DesJardins & Lindsay, 2008). North Carolina's community college system began phasing in a multiple measures placement strategy in 2013 and by 2016 all colleges were using it. Early results have demonstrated increased numbers of students completing college level credits (Barbitta & Munn, 2018). This result is not all-together surprising given similar results in other states. It is important to note that the North Carolina system also provided increased academic supports, including a support class. Other colleges and universities have followed a different path through the adoption of noncognitive assessments.

The VCCS chose to begin allowing placement of incoming students based on high school grades and course completion in Fall 2017 (VCCS, 2017). The following tables display the cut scores for course placement in Math and English. MTE represents the Math developmental units.

**Table 1**  
*VCCS Multiple Measures for Math Placement*

<b>Math Placement Measures#</b>	<b>HSGPA or Score Range</b>	<b>Placement</b>
<b>HSGPA and Algebra II and One Algebra Intensive Course*</b>	<b>3.0 or higher</b>	<b>MTE 1-9 Satisfied</b>
	<b>2.7-2.9</b>	<b>MTE 1-9 Co-Requisite Eligible</b>
<b>*Algebra Intensive Courses above Algebra II: Trigonometry, Math Analysis, Pre-Calculus, Calculus, Algebra III.</b>		
<b>HSGPA and Algebra II</b>	<b>3.0 or higher</b>	<b>MTE 1-5 Satisfied</b>
	<b>2.7-2.9</b>	<b>MTE 1-5 Co-Requisite Eligible</b>
<b>HSGPA and Algebra I</b>	<b>3.0 or higher</b>	<b>MTE 1-3 Satisfied</b>
	<b>2.7-2.9</b>	<b>MTE 1-3 Co-Requisite Eligible</b>
<b>SAT - Math</b>	<b>530 or above</b>	<b>MTE 1-9 Satisfied</b>
	<b>510-520 range</b>	<b>MTE 1-5 Satisfied</b>
<b>ACT - Subject Area Test Math</b>	<b>22 or above</b>	<b>MTE 1-9 Satisfied</b>
	<b>19-21 range</b>	<b>MTE 1-5 Satisfied</b>
<b>GED - Math</b>	<b>165 or above</b>	<b>MTE 1-5 Satisfied</b>
	<b>155-165 range</b>	<b>MTE 1-3 Satisfied</b>



**Table 2**  
*VCCS Multiple Measures for English Placement*

<b>English Placement Measures</b>	<b>HSGPA or Score Range</b>	<b>Placement</b>
<b>HSGPA</b>	<b>3.0 or higher</b>	<b>ENG 111</b>
	<b>2.7-2.9</b>	<b>ENF3/ENG 111</b>
<b>SAT-ERW (Evidence-Based Reading and Writing)</b>	<b>480 or above</b>	<b>ENG 111</b>
	<b>460-470 range</b>	<b>ENF3/ENG 111</b>
<b>ACT-Subject Area Tests English and Reading</b>	<b>18 or above</b>	<b>ENG 111</b>
	<b>15-17 range</b>	<b>ENF3/ENG 111</b>
<b>GED-English</b>	<b>165 or above</b>	<b>ENG 111</b>

As indicated in Table 1 and Table 2, the VCCS allows for the usage of these high school grades for five years following graduation, along with five years for the standardized placement test. After that time, if the student has not taken and passed a college level Math or English class, they would be directed to take the Virginia Placement Test. Next, the following section will detail the use of noncognitive assessments in prediction of academic performance, moving away from the use of cognitive tests and high school performance.

### **History of Noncognitive Assessments in Education**

Interest in non-cognitive measures goes back to at least the 1890's when Galton (1892) collected information on accomplished individuals and concluded that ability alone was not responsible for success but needed to be in combination with zeal and a capacity for hard work. Research has continued through the 1920s to the 1950s when efforts were made to collect some personal and social dimensions in assessment and up to the present day (Sedlacek, 2004). The search for alternative metrics led to the study of what have been called noncognitive factors or psycho-social factors, as these traits were first commonly called by Erikson in 1959 (McLeod, 2018). Colleges and universities have actually long used noncognitive factors in their admission process. For instance, race and socioeconomic background, the status of a close family member being an alumnus, and achievements in the fields of athletics or elsewhere have a long history in the consideration of who is admitted to a complete school or program. In the proposed study, some of those variables are collected so that they can be controlled for so that the impact of the NCQ can be measured.

Interest in this field is evidenced by the number of instruments designed to measure noncognitive assessments available. A compilation published by the Community College Research Center listed five pages worth (Kafka, 2016). A list of traits or factors generally considered in this field includes: mindset, motivation, self-esteem, self-control and persistence, self-efficacy, study behaviors, relationships with peers, academic and social integration and many more (Bandura, 1997; Conley, 2007; Sedlacek, 2004; Tinto, 1993). There is evidence that these factors may be better predictors of college success than SAT scores or high school performance, particularly for underserved minorities (Crede & Kuncel, 2008; Reid & Moore, 2008; Sedlacek, 2004; Sedlacek & Adams-Gaston, 1992; Sedlacek & Sheu, 2008; Sparkman et

al., 2012; Ting, 2009; Ting & Sedlacek, 2000; Tucker & Mcknight, 2019). For example, Flowers (2015) explored the perceptions of Black engineering majors from two highly selective institutions in the South. The findings suggested that support was a common element in the positive academic identity for participants (p. 69). This study demonstrated “the importance of non-cognitive variables on academic identity development of Black male engineering students” (p. 71). The relationship between self-perception, motivation, attributions, and self-regulation with community college achievement was found to be positive and significant (Fong et al., 2017). Other tests that examine personality traits linked to success include the SSI, the Big Five, the CCSSE, the GRIT scale, and the NCQ.

### **Noncognitive Assessments**

The Situational Attitude Scale (SAS) was developed to provide a means for assessing attitudes towards racial and ethnic groups, as well as feelings of prejudice and discrimination. It has often been used along with the Noncognitive Questionnaire (NCQ) to determine inclusion in nontraditional groups who might not score as well on standardized tests (Sedlacek and Brooks, 1970). It has been shown reliable and used with such groups as Blacks, Jews, Arabs, Mormons, the elderly and more. The test-retest and coefficient alpha reliability estimates for the various forms are in the .70 to .89 range (Sedlacek, 1996). The SAS was designed to measure feelings that many people are not comfortable expressing. A simplified instrument, the SAS-S also exists with simpler language for use with populations with less than a college education

Le et al. (2005) developed the Student Readiness Inventory, designed to measure psychosocial and academically related skills (e.g., study skills, problem-solving skills) predictive of college success as measured by GPA and persistence. Now known as the ACT Engage college survey, it is supposed to be taken before students begin college. Students get back a report

showing how their scores compare with students at a similar (two-year, four-year) institution. By itself, the ACT Engage survey is able to correctly identify 24 percent of those students who will drop out and 46 percent of those students who will earn less than a 2.00 grade point average (Pike, 2012). Unlike the NCQ, the SRI also includes predictive scales on a range from one to 99 that are a combination of SRI and achievement information. Students are measured as to their likelihood of academic success and retention.

The Noel Levitz's College Student Inventory <sup>TM</sup> (CSI) looks at student's self-reported responses to questions and measures academic motivation, general coping, receptivity to support services and other noncognitive factors. As an example of its effectiveness, researchers studied ten years of longitudinal CSI data at a midwestern university and found that two CST scales, Predicted Academic Difficulty and Dropout Proneness, were predictive of cumulative GPA across all cohort groups. Three of the four CSI compound scales (not Receptivity to Institutional Help) were found to be predictive of ratio of credits earned to credits attempted through the fourth semester and retention through a maximum of eight semesters (Slanger et al., 2015). Noel Levitz also has a product called the Student Satisfaction Inventory (SSI), mentioned here because student satisfaction with an institution has been linked to persistence. The SSI report provides data by which colleges can measure their populations against national averages, including two-year colleges, and provides information very similar to the Community College Survey of Student Engagement (CCSSE), a product and service of the Center for Community College Student Engagement (ccsse.org, n.d.)

Grit has been defined as perseverance and passion for long terms goals (Duckworth et al., 2007). This noncognitive trait was shown to be more reliable in predicting success than either IQ or conscientiousness, though highly correlated with the latter. Among the excitement about

GRIT is the claim that “grittiness” can be taught, thereby leading to higher success rates of people in a variety of endeavors, including post-secondary education. Grit has been linked to conscientiousness, one of the “Big Five” model of personality traits: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Ivcevic & Brackett, 2014). Duckworth and colleagues developed a short scale to measure grit that has been used on subjects as diverse as West Point cadets to Scripps National Spelling Bee contestants. The GRIT-S scale does measure persistence to long term goals, similar to the NCQ’s long-range goals and the willingness to overcome them; a similar concept is resilience (Munt & Merydith, 2011).

### **Further Research into the Usefulness of Noncognitive Assessments**

Allen et al. (2010) provided an overview of years of research and analysis on psychosocial factors/noncognitive factors and imagined interventions at what they termed a “typical” post-secondary institution with a first-year academic failure rate of 24 percent and a first-year dropout rate of 32 percent. They found that the use of interventions that used these factors have the potential to considerably effect the financial bottom line. It takes little imagination to extend this benefit to the lives of the students involved. Schwartz and Washington (2002) examined the academic performance of Black first year male students at an HBCU, finding certain academic adjustment, personal emotional adjustment, and high school GPA predictive of academic performance and retention. Mattson (2007) studied the characteristics of an ethnically diverse group of 591 students entering a university and found variables such as pre-college leadership, high school GPA, and gender predictive of first semester GPA and first year GPA.

Not everyone believes that noncognitive measures are a good predictor of academic success (Lanham et al., 2011; Schwartz & Washington, 2002; Thomas et al., 2007). In a meta-

analysis on the topic, researchers reviewed 311 articles or dissertations that used the Non-Cognitive Questionnaire (NCQ) for the purposes of evaluating the usefulness of the instrument. Most of the studies were not included for reasons that included not enough available data on the NCQ, review articles not original work, unavailable effect sizes, criteria not related to student success or other reasons. Forty-seven studies with 490 correlations and pairwise 9,321 sample size remained and were analyzed. The Hunter and Schmidt (1990, 2004) meta-analytic procedure was used to combine data. Results indicated that the NCQ scores are largely unrelated to GPA, college persistence, and credits earned. Results did show that Black or African-American students do tend to score higher than White or Asian students, but that these higher scores are not highly correlated with success in post-secondary education (Thomas et al., 2007).

Robbins et al. (2004) analyzed 109 published studies of psychosocial factors, grouped them into categories, and studied the effects on academic performance and retention. Their findings showed that there was a significant correlation on one or both outcomes. Moreover, they stressed that the effect sizes of these factors were as large as those found by more traditional measures (SAT, high school grades and socioeconomic status were included). They found that the factors, what they call constructs, were incrementally predictive. For example, achievement motivation, academic goals, and academic self-efficacy were incrementally predictive of academic performance. Moreover, they found that academic goals, institutional commitment, social support, social involvement, academic self-efficacy, and academic-related skills were incrementally predictive of persistence (Robbins et al., 2004).

Further, Tobey (1996) found that for college students deemed at-risk; self-concept, support of family and friends, and anxiety were significant in predicting retention and persistence. Naumann wrote about the limitations of traditional placement exams and noted that

they predict at best 10% to 30% of first semester GPA. Their study (1998) examined learning variables such as cognitive strategy, finding them better at predicting college success than SAT or ACT scores alone. Lastly, Kappe and van der Flier (2012) examined post-secondary students in the Netherlands to assess the predictive ability of both intelligence and personality. They found conscientiousness was the best predictor in explaining GPA and time to graduation. To summarize, researchers are finding many noncognitive factors strong predictors of success in college. In many cases, researchers find these factors stronger than traditional tests alone.

### **Application with Community College Students**

Most of the research involving noncognitive factors or psychosocial factors has involved four-year college and university students. Compared with their four-year peers, two-year college students tend to be older, need more remediation, lower socio-economic status, more diverse, take fewer courses per semester and work more hours per week (AACC, 2019). Public community colleges also differ in terms of open access compared to their more selective four-year brethren. Much of the research has focused on predictive factors; important when considering competitive admissions, but not quite as relevant for community colleges. For these colleges, the importance of this data lies in predicting student performance as it relates to persistence and graduation.

In a study across 14 community colleges involving 4,481 students, Porchea et al. (2010) found that students who scored higher in academic discipline and commitment to college areas on the SRI were more likely to obtain higher grades and transfer. The most prevalent outcome of the students was dropout – 48 percent. Higher academic self-confidence was associated with lower degree attainment. In a recent study of 13,000 students who passed their GED exam in New York and indicated they wanted to attend college, the researchers examined employment

status, parent status, race, ethnicity, gender, age, and proximity to a community college, and could find no significant difference in those who did enroll versus those who did not (Rossi & Bower, 2018). Since the proposed study will involve usage of the NCQ, much of the remainder of this chapter will examine it in greater depth than the noncognitive assessments previously parsed.

### **Theoretical Framework**

The two most popular assessments of scholastic potential, the SAT and ACT, were developed in the last century and largely measure conventional IQ (Sternberg, 2015). Though the ACT was created as an alternative to the SAT, measuring a broader range of abilities that simply verbal and math, the truth is the two are highly correlated and measure many of the same things (Micceri, 2010; Sedlacek, 1998). Contemporary intelligence theories stress that intelligence exists in many forms and can be improved through education (Ekinci, 2014). Sternberg (1985) was a leader in the field of cognitive psychology, a contemporary of Sedlacek, and his triarchic theory of intelligence heavily influenced Sedlacek in the development of the NCQ.

Sternberg proposed that there are three basic ways a person possesses and demonstrates intelligence: componential, experiential, and contextual (Sternberg, 1985, 1986). Sometimes he referred to his theory as “successful intelligence.” Componential intelligence, sometimes referred to as analytical intelligence, is how a person solves abstract, traditionally academic problems. This is kind of intelligence most often measured by standardized tests and prior grades (Sternberg, 1985, 1986). Experiential intelligence, sometimes called creative intelligence, is the kind used by people who are skilled in discovering, creating, and inventing (Ekinci, 2014). Contextual intelligence, sometimes referred to as practical intelligence, is understanding and



using abilities to overcome everyday problems. This type of intelligence is often referred to as “street smarts” (Howard et al., 2001).

William Edward Sedlacek is professor emeritus from the University of Maryland, College Park, and has contributed over 300 articles in professional journals and books on topics such as multicultural issues, tests and assessments, advising, research methodology and employee selection (Sedlacek, 2004). Early in his career he became convinced that what he called “The Big Test” did not provide a good measure of all applicants and could be improved upon to colleges and universities both select fitting applicants and provide information to them about the developmental and learning needs of students. In a career spanning over fifty years, he has studied how noncognitive variables have an impact on student success on many groups of students but particularly for nontraditional students.

According to Sedlacek (2004):

Our current tests don't do that. They give us *some* information that is useful for *some* students in predicting what grades they will get in their first year in college, but they don't even do that well for people of color, women, or anyone who has not had a White, middle-class, Euro-centric, heterosexual, male experience in the United States. (p. 6)

Building on Sternberg's theory of experiential and contextual domains (1985, 1988, 2004, 2012), Sedlacek and Brooks developed the NCQ in 1976. It was later modified by Sedlacek and Tracey in 1982. Several forms have been developed and employed since. (Sedlacek, 2004).

### **Review and Synthesis of the NCQ Research**

Concluding that there are built in equity and sociological biases and other difficulties with the traditional academic tests being used, Sedlacek and Brooks (1982), with the help of other colleagues, designed a noncognitive questionnaire (NCQ) to assess student traits and predict success in academic settings. Colleges know that considering race as an admissions characteristic is a tricky business, but courts have allowed the use of noncognitive variables in admittance as a variable approach (Sedlacek, 2004). Researchers using the NCQ have found differences in scores on the instrument when comparing gender, race and ethnicity. This is important to note because one of the reasons for the development of these tests was to address the score differences on the SAT, ACT and GMAT that may be due to racial factors and find methods that ameliorate the differences (Sternberg, 2004, 2012).

Tracey and Sedlacek (1982, 1984) successfully demonstrated predictive validity of the NCQ with SAT scores on first-semester GPA, third semester cumulative GPA, and persistence. Studying the performance of 1,529 students in their first year, they found the NCQ a better predictor than the SAT on third semester GPA for both Black and White students. Together, the NCQ and SAT improved prediction of academic performance better than either measure alone. Further studies by Tracey and Sedlacek (1982, 1984, 1985, 1986, and 1987) showed the value of the NCQ predictive ability over eight semesters, five- and six-year graduation rates. These studies, like many of the studies using the NCQ, used stepwise regression analysis to reveal that the NCQ was predictive for Black students but not in some cases for White students and that SAT scores did not always predict persistence for either group. The former discovery had been hypothesized by Sedlacek and was foremost among the reasons for the creation of the NCQ.

Namely, that underserved minorities may be ill served by traditional tests and that admissions criteria at four-year colleges should be broadened to include noncognitive traits.

Noonan et al. studied 263 community college students in health sciences programs. Community service, strong support person, and leadership best predicted GPA over two years (Noonan et al., 2005). Scores on the community trait were most predictive, and in this area these students scored the lowest of all the traits assessed by the NCQ.

Ting and Bryant (2001) used the NCQ to analyze the GPA of Native American and White students at a southern public university. Forty-eight Native Americans and 122 White students completed the NCQ and the results showed that for Native American students, fall GPA was correlated with SAT verbal scores, realistic self-appraisal system, and successful leadership experience. For White students, fall GPA was significantly related to NCQ traits of successful leadership experience, demonstrated community service, preference of long-term goals, along with SAT verbal and mathematics scores, expectation of highest level of education, and family expectation.

Ting (2003) used the NCQ to predict academic success and retention of first-generation college students at a large public research university. SAT Math score, the admissions index (derived by a university matrix, were studies alongside the NCQ. Again, a stepwise regression method was used and the NCQ trait Coping with Racism (later revised to successfully handling the system) was a significant predictor for first-semester GPA for all students. Leadership experience, the admissions matrix, and SAT Math were found to be of significance. The NCQ trait community service successfully predicted third-semester GPA for White students and students of color. Furthermore, the overall NCQ was not able to successfully predict retention for

first-generation White students but it did predict retention for students of color in their third, fifth, sixth, and eighth semesters.

Adebayo (2008) examined the predictability of cognitive and non-cognitive measures on the academic success of 143 students who were admitted to a conditional admission program at a university. This program allowed students who did not meet the traditional requirements of the four-year school to still be admitted, so it is a given that their traditional cognitive scores and/or completed number of college credits were lower than those of traditional admitted students at this university. Variables included the NCQ, first-semester GPA, high school class ranking, ACT score, and high school GPA. In this study the stepwise multiple regression results demonstrated that high school GPA and two of the NCQ traits (self-appraisal and coping with racism) were found to be significant predictors of academic success. High school GPA alone accounted for 14 percent of the variance, but combined with the two traits listed above, they predicted 21 percent of the variance of first semester grades in college.

Ting (2009) studied Division I athletes at public university by asking them to take the NCQ during a course required as part of their freshmen year. Their SAT scores were collected along with demographic information and stepwise multiple regression was run to determine what factors were most predictive of first year GPA. The noncognitive variables that significantly predicted first year GPA were: Positive Self-Concept, Preference for Long-Term Goals, Demonstrated Community Service, and Acquired Knowledge in a Field. Ting found, as did other researchers listed above, that the noncognitive factors were more predictive of academic success than the SAT.

This review of the literature does not cover nearly every use of the NCQ, but it does cover enough of a representational sample to demonstrate the versatility and usefulness of this

instrument. The NCQ has most frequently been used to predict cumulative GPA and retention, alone or in conjunction with traditional cognitive assessments. Designed to allow the researcher to shine a spotlight on the intelligence and academic promise of underserved minorities, it has been found statistically valid on special populations that include: Black students (Nasim et al., 2005; Tracey & Sedlacek, 1984), student athletes (Sedlacek & Adams-Gaston, 1992), Asian Americans (Fuertes et al., 1994), females (Ancis & Sedlacek, 1997), first generation college students (Ting, 2003) and community college students (Noonan et al., 2005).

To summarize, though there are criticisms of Sedlacek's NCQ, there is sufficient evidence of the questionnaire's merits to continue its use as an instrument of assessment. Generally, reviewers agreed that Sedlacek's intention of using noncognitive assessments as well as traditional cognitive variables, is worth further research to improve admissions processes and college climates for diverse students (King & Bowman, 2006).

### **The Noncognitive Questionnaire**

The NCQ is made up for 29 items. The first six items gather demographic information such as social security number, sex, age, parent's occupation, and race. These are followed by 23 questions that use a Likert-type five-point scale. Items on the NCQ are designed to assess eight non-cognitive dimensions associated with student academic success. Some of the questions are open and require participants to choose from a selection or provide examples from their own lives. The following describes those questions in more detail.

Question seven asks, "How much education do you expect to get during your lifetime?" The four choices are: "College, but less than a bachelor's degree"; "B.A. or equivalent"; "1 or 2 years of graduate or professional study"; "Doctoral degree such as M.D., Ph.D., etc.". Question eight asks the participant to list three goals. The ninth question is "What would be the most likely

cause if the participant had to leave college before receiving a degree. The possibilities are: “Absolutely certain that I will obtain a degree”; “To accept a good job”; “To enter military service”; “It would cost more than my family could afford”; “Marriage”; “Disinterest in study”; “Lack of academic ability”; “Insufficient reading or study skills”; or “Other”. Question 10 requires the participant to respond to the prompt: “Please list three things that you are proud of having done.” The last and 29<sup>th</sup> question on the NCQ is asks the participant to “List any offices held, along with any groups that he belonged to in high school and the community.”.

The NCQ measures concepts that fall into each type of intelligence identified by Sternberg but focuses less on the analytical domain as that is measured already by traditional standardized placement tests. The NCQ measures: positive self-concept, realistic self-appraisal, successfully handling the system, preference for long-term goals, availability of a strong support person, leadership experience, community involvement, and knowledge acquired in a field (see Appendix A).

1. **Positive Self-Concept or Confidence.** People who score high in this area feel confident that they can handle adversity, graduate, and do well in nonacademic areas. This student has a “strong self-feeling, strength of character, determination, independence” (Sedlacek, 1993, p. 34).
2. **Realistic Self-Appraisal.** This student has the ability to “recognize and accepts any strengths and deficiencies, especially academic” (Sedlacek, 2004, p. 37). The ability realistically to self-appraise is important for females who may receive negative or confusing feedback from instructors or family members about their academic performance (Ancis & Sedlacek, 1997). Webb et al. (1997) found that Black females who realistically appraised the difficulty of academic work was correlated with grades.

3. **Understands and Deals with Racism.** In this context, racism is used as a term to identify all cultural biases directed toward a population. The ability to handle racism has been found predictive of college graduation for underrepresented minorities (Bennett, 2002). This question has also been rephrased as “successfully handling the system”; a version that can be more broadly interpreted and natural sounding to those who might not believe they experience racism (Sedlacek, 2004). This scale on the NCQ is intended to measure students’ expectations of encountering any type or form of bias, including sexism, and their ability to deal with the issue.
4. **Preference for Long-Range Goals to Short-Term or Immediate Needs.** A student’s ability to delay gratification in order to focus on long term goals. Tracey and Sedlacek (1989, 1994) found evidence that possession of this trait predicted college grades, retention, and graduation for Black students. Those students who do not score high on this attribute do not work toward specific accomplishment or set goals. Instead, they proceed without a direction or plan toward goals that are undefined or unrealistic (Sedlacek, 1993).
5. **Availability of Strong Support Person.** For this factor, the student recognizes the need for help and is able to find someone that they see can ask for help on a regular basis. USM students traditionally have not attended nor completed college at the same rates that White students do and are therefore less likely to have parents who have done so. Research demonstrates the importance of role models and mentors to female academic and career success (Ancis & Sedlacek, 1997; Tidball et al., 1989) and Black or African-American student researchers (Davidson & Foster-Johnson, 2002).

6. **Successful Leadership Experience.** Nontraditional students who are most successful in post-secondary education have demonstrated the ability to coordinate and lead others (Sedlacek, 2004). This factor can be demonstrated on the NCQ through a variety of forms that include community, church, or scholastic curriculum (Sedlacek, 1993). A significant positive relationship exists between successful leadership experiences, increased self-esteem, and grades for female students (Ancis & Sedlacek, 1997; Pascarella & Terenzini, 1991; White & Shelley, 1996).
7. **Demonstrated Community Involvement or Service.** Being part of a community, they can identify with and derive support from is crucial to the success of female students and underserved minorities (White & Shelley, 1996; Sedlacek, 2004). Many students among the minority at their schools, who do not see students who look like them, feel isolated and are more prone to not persist to graduation.
8. **Knowledge Acquired in a Field.** People from some minority groups have shown a preference for learning in ways that are not the dominant method tested in the traditional school system (Sedlacek, 2004). This relates directly back to why performance on standardized tests, the traditional method for assessing scholastic aptitude, learning, and promise, may be a barrier to students from underserved minorities. Fortunately, there are other ways to demonstrate knowledge.

Underserved minority students are often at odds not only with the compositions of their institution's student body but also the racial, ethnic and socioeconomic makeup of its faculty. The literature about minority students is unequivocal in the negative effect these feelings have on academic performance. This is then compounded by being assessed and placed according to a standardized test that does not accurately measure their intellectual gifts and consigns them to



developmental coursework, making them less likely to complete college level work and graduate.

### **Conclusion**

While community colleges' performance has been under the microscope for decades, progress has been painfully slow and there is still much disagreement about the implementation of practices that will engender student success. Students who take orientation and/or study skills courses have been shown to be less likely to drop out (Windham et al., 2014), and this study pulls from a population taking an orientation during their first semester in college. This study, however, examined the noncognitive factors specifically captured within the NCQ. Clearly, the answer to helping more students be successful at community colleges is more than just providing an orientation course during the first semester.

One gap apparent in the literature is community colleges analyzing students noncognitive scores and combining them with traditional placement measures to ascertain risk. There are many examples of four-year colleges and universities using noncognitive measures in the selecting students for admissions. Some examples are Tufts, the Louisiana State University Medical School in New Orleans, the University of Maryland Medical School and the Gates Millennium Scholars program (Sedlacek, 2003). While the problem of placement into pre-college or developmental coursework has been much studied, another existing gap exists in the research of what the experience is like from the student perspective. One exception examined the experience of Latino/as (Acevedo-Gil et al., 2015) taking pre-college level coursework. Using critical race theory and a validation model as framework, the study found that staff and faculty operated off a deficit model, blaming the students for not attending class and not enough time spent doing homework. Invalidation led to the students questioning their own ability to complete

the coursework, whereas validation accomplished the opposite. From the student perspective, they were trying quite hard and teacher demands were unrealistic (Mau, 1993). Perhaps the difficulty is structural. Other research has suggested the positive influence of cooperative learning models for Native Americans or students of color (Hooker, 2011).

Among the many criticisms of the SAT and ACT one of the most damning is that by providing a test widely promoted as judging all students equally, the tests have instead, by virtue of not assessing nontraditional students fairly, acted as an agent promoting unequal access to education. It is hoped that by examining self-reported NCQ surveys together with existing cognitive assessment and multiple measures, changes can be wrought that will affect student outcomes. For instance, while community colleges are open access, knowing in advance which students might struggle can prompt mandatory interventions for them. Or possibly, by prompting discussion about the experience from the student viewpoint, productive changes can occur regarding practices impacting the success rates of underserved populations; practices such as collaborative learning, deliberate bolstering of student academic confidence based on small successes (Bickerstaff et al., 2017), and caring and consistent validation (Acevedo-Gil et al., 2015).

In the next chapter the researcher will provide a restatement of the purpose and research questions, followed by a proposed research study that will examine community college NCQ scores and combine that with traditional placement tests and multiple measures to predict academic success. Chapter four will provide an analysis of the detailed study while chapter five will examine and discuss the results, concluding with the implications for two-year and four-year colleges and universities, with a section detailing recommendations for post-secondary practitioners.

## **CHAPTER III**

### **METHODOLOGY**

This chapter will begin with a restatement of the purpose, research questions, and hypotheses for this study. It will continue with an explanation of the study's research design, setting, participants, instrumentation, data collection, and data analysis. The chapter will conclude with discussion of limitations and a conclusion.

#### **Purpose Statement**

The purpose of this study was to examine the predictive effects of noncognitive factors (e.g., resiliency, motivation, self-efficacy, etc.) on the academic performance of first year students at a mid-sized community college in Virginia. Students were broken into two groups: White/Asian and underserved minorities (Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native) to ascertain if the percentage of the student performance accounted for is different according to group. Specifically, this study examined student performance as defined by first semester GPA and persistence as defined by retention to second year. This last term was defined as whether a student reenrolls in a second consecutive fall semester, sometimes referred to as fall-to-fall retention. Furthermore, this study analyzed the predictive nature of noncognitive factors alone, along with demographic factors such as gender, race/ethnicity, and in conjunction with traditional placement tests (i.e., Virginia Placement Test, SAT, or paired with high school grade point average combined with high school math course completion to determine the most accurate method for assessing potential student achievement.

### **Research Questions**

The four research questions guiding this quantitative dissertation were:

- 1 To what extent do noncognitive factors predict first semester GPA for community college students above and beyond cognitive factors?
- 2 To what extent do cognitive and noncognitive factors predict fall-to-fall persistence for community college students?
- 3 To what extent do cognitive and noncognitive factors predict first semester GPA and fall-to-fall persistence for underserved minority students?
- 4 To what extent do noncognitive factors predict first fall-to-fall persistence for community college students above and beyond other factors?

### **Hypotheses**

Four hypotheses relate back to the preceding research questions:

H1. Noncognitive variables will not significantly contribute to the first semester GPA of incoming community college students.

H2. Noncognitive variables will not significantly contribute to the likelihood of retention to second year of incoming community college students.

H3. Noncognitive variables relationship on first semester GPA will differ significantly when student gender, race, and type of placement are assessed.

H4. Noncognitive variables relationship on retention to second year will differ significantly when student gender, race, and type of placement are assessed.

### **Research Paradigm**

This study was conducted with a post-positivist approach to investigate the research questions previously addressed. Post-positivism assumes a single objective reality separated

from the feelings and beliefs of individuals. This type of approach is appropriate for the proposed quantitative research study (Leedy & Ormrod, 2015). Hierarchical linear regression analysis is a statistical method for predicting an outcome variable from multiple predictor variables (Fields, 2013). This statistical approach was chosen to examine relationships for multivariate datasets is a practice recommended in academic texts (Field, 2013; Leedy & Ormrod, 2015). A number of assumptions must be considered when using multiple regression analyses, which are explored further in this chapter.

### **Setting**

Students were selected from those enrolled at one mid-size community college. This college is one of the 23 institutions that make up the Virginia Community College System and ranked roughly in the middle of the system in percentage of students retained fall to fall. In the year studied, there was an unduplicated headcount of approximately 7,400 students and a fall student population of approximately 5,300 individuals (College, 2019). The number of first time in college (FTIC), program-placed students was approximately 800. The school offers a variety of Associates degrees for students who intend to transfer to four-year institutions as well as occupational technical degrees and certificates for students intending to go immediately into the workforce. Students also take courses for personal satisfaction or for reasons not related to the completion of a degree, and some students pursue noncredit courses. Classes are available on-campus, online, and in a hybrid format that combines on-campus and online instruction. Students in an Associate degree program are strongly encouraged to take the college's Student Development course (SDV 100) in their first semester and over 700 enrolled in that course in fall 2018.

The credit taking student body for the 2018-2019 school year was 69 percent White, 13 percent Black or African American, and 18 percent other races. Forty-nine percent were 21 years old or less while 59 percent identified as female while 41 percent identified as male. Almost all students were part time: 88 percent part-time to 12 percent full-time.

Access to the necessary data was provided through the college's Office of Institutional Research, and permission obtained from ODU's Human Subjects Committee. Other information required for this study was obtained through the college's student information system, which I had access to by reason of being an employee of the college.

### **Participants**

The population studied was representative of the college student body and the participants included in this study were all those over the age of consent enrolled at the examined community college taking a one-credit orientation course during the fall 2019 semester. All students who enroll in an Associate's degree at this college are expected to complete SDV 100 Student Orientation during their first semester, which for most students happens to be in the fall. The selection method was convenience, also known as accidental sampling, and was appropriate because of the attempt to get the broadest possible sample of incoming students (Leedy & Ormrod, 2015). The other reason this sample method was chosen was to contrast the results of populations contained within a larger sample. The Noncognitive Questionnaire (NCQ) was developed and has most frequently been used on "non-traditional" college student groups (Sedlacek, 2005). These were defined by as not typically White males of European descent, who had potentially experienced discrimination due to gender and/or race (Sedlacek, 2005).

## Variables

**Independent Variables (IV).** The independent variables studied were the eight Non-Cognitive Questionnaire (NCQ) factors. The NCQ is a 23-item measure assessing eight noncognitive variables that are thought to predict the performance and retention of students in college. The researcher will dummy code the method of placement (i.e., SAT, ACT, previous college level work, multiple measures, or VPT).

**Dependent Variables (DV).** There will be two, separately assessed dependent variables: GPA and retention to second year measure by enrollment at the same higher education institution in the fall semester of a student's first and second year.

**Demographic Variables.** Gender, race/ethnicity, and work hours data will be collected. Gender will be measured as a binary variable (0=male, 1=female). The college's student information system does not yet have other gender options. Race will be entered as categorical value of 1 for Black, Hispanic, or Native American and 0 for White or Asian.

## Research Instrument

The NCQ was developed to identify the noncognitive variables that are associated with academic achievement for students from minority populations (Thomas et al., 2007) and measures student characteristics not captured by standardized tests. Previous research has demonstrated that the academic success of students from minority groups who experience inequalities in a college environment can be predicted by the eight non-cognitive variables measured by the NCQ (Ancis & Sedlacek, 1997; Boyer & Sedlacek, 1988; Fuertes & Sedlacek, 1994; Sedlacek & Adams Gaston, 1989; Ting, 2000; Tracey & Sedlacek, 1984).

The NCQ is comprised of 29-items combining both Likert-type and open-ended questions designed to measure participant responses towards eight non-cognitive variables

(Sedlacek, 2004). The first seven items are demographic questions and are not used in the scoring of the NCQ. They ask for age, gender, race, amount of education expected over the course of the respondent's lifetime, grade expected in SDV class, parent and immediate family's education, hours worked per week, father's occupation, mother's occupation, and race. Some of these items were slightly modified for the purpose of this study.

### **Reliability and Validity**

The reliability is the extent to which a measurement instrument yields consistent information about the characteristics being assessed (Leedy & Ormrod, 2015). Reliability was assessed using factor analysis. The test-retest reliability of the NCQ was found to range from .70 to .94, with a median of .85 for the NCQ items with differing samples (Sedlacek, 2004; Tracey & Sedlacek, 1984). The research ensured alphas meet the minimum recommended alpha of .70 to be included in the analysis (DeVellis, 2003)

The validity of an instrument refers to the extent to which a measurement instrument accurately measures the characteristic it is intended to measure and enables justifiable inferences about that characteristic (Gall et al., 1996). Construct validity requires a series of studies gathering evidence, testing a hypothesis based on the construct (Sprinthall, 2012). Woods and Sedlacek (1988) assessed construct and congruent validity of the NCQ, finding evidence for seven of the eight traits. Earlier research found evidence for all eight (Tracey & Sedlacek, 1984, 1985). Though there have been criticisms of the validity of the NCQ (Marchant, 2001), other research has found significant validity on noncognitive factors congruent with those assessed in the NCQ (Robbins et al., 2004; Sedlacek, 2004a). Also, Pieterse (2007) and Smith (2001) reported the NCQ demonstrated satisfactory reliability, construct, and predictive validity in separate reviews of the assessment instrument.



### **Data Collection Procedures**

All faculty teaching the orientation course were provided a course template with the NCQ a requirement on the suggested syllabus. Faculty were also prompted by email by the SDV coordinator to encourage their students to complete the assignment. Students were given the length of the semester to complete the online questionnaire, even if their course was of shorter duration (12-week, 8-week, etc.). An email with information about the questionnaire, the researcher, the informed consent form and a link to the questionnaire was sent to all student email addresses of SDV 100 rosters. Data were collected from students who followed the link from their student email, provided informed consent, and completed the instrument (Appendices B and C).

The cover letter provided students with information about the purpose of the study, why they were contacted, and the nature of the data to be collected. It also provided reassurances about the confidentiality of their information, contact information for the researcher, and explained the necessary disclosures outlined by the IRB in order for the participants to make an informed decision about participation before completing the survey.

The instrument used was the slightly modified Non-Cognitive Questionnaire (Appendix D), and a fuller description of the modifications follows. Question 1 was changed to remove a request for the student's social security number. In Question 2, the word "sex" was changed to "gender." Question 7's first response item was changed from "College, but less than a bachelor's degree" to "Associates degree or certificate." Minors under the age of 18 were exempted from the study for ease of survey collection and difficulties getting parent/guardian permission for college students.

### Scoring the NCQ

The NCQ is scored by using the scoring key provided by the developers in Appendix E (Tracey & Sedlacek, 1984). This key is used to score participant responses to every item on the NCQ beginning with Question 8.

Individual items are categorized into one of the eight non-cognitive dimensions. Positive Self Concept or Confidence (I) is scored by items, 7, 9, 10, 23, 20, and 28. Realistic Self-Appraisal (II) is scored by items 9, 12, and 21. Scores from items 11, 18, 22, 26, 27, are used to assess Understands and Deals with Racism (III). Items 8A, 13, and 19 are used to score for Prefers Long-Range Goals to Short-Term or Immediate Needs (IV). A fifth non-cognitive variable is the Availability of Strong Support (V) and is scored by items 15, 24, and 25. Leadership (VI) is scored using items 14, 17, and 29A. Demonstrated Community Service (VII) is scored by items 16 and 29B. Item 8B and item 29C are used to score Knowledge Acquired in a Field (VIII). Each item response is assigned a corresponding numerical value. For NCQ questions that have more than one response the mean score is calculated and rounded to the nearest whole number. Scores for each NCQ variable (e.g. "Leadership") are computed by complex algorithms that are provided in the scoring key. A high score on an NCQ variable indicates a greater strength in that non-cognitive variable. In scoring the answers, thirteen of them are "negative" items and per the NCQ scoring instructions, were required to be reversed that 1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1.

There are three open-ended questions that require three answers regarding things one is proud of having done; goals one has for him or herself; and offices held or groups belonged to in high school. Coding these answers is conducted by hand and is time-intensive. The scoring key provides a grading rubric explaining how each answer should be rated 1-3. For example, answers

to question 29B are used as part of scoring Community Service Relatedness and would be scored thusly: (1) = no community service performed by group, or vague or unclear in relation to community service (e.g., “basketball team”); (2) = some community service involved but it is not the primary purpose of the group (e.g., “Scouts”); and (3) = group's main purpose is community service (e.g., “Big Brothers/Big Sisters”).

### **Data Collection**

A pilot study was conducted in fall 2018 with students from one area high school provided an opportunity to complete the previously described modified NCQ. Permission was obtained from ODU’s Institutional Review Board and the Institutional Research office at the host college. A query was run that identified the students who were subsequently sent a link to the informed consent forms and the survey. Participants were offered an entry into a raffle to win a \$100 Visa gift card. The pilot study identified a few areas that needed to be improved to facilitate clearer communication with participants.

For this study too, data were collected from students who followed the link from their student email, gave informed consent, and completed the online survey. The researcher again obtained a copy of the Request for Exemption of Research Involving Human Subjects from ODU’s Institutional Review Board Prior before students were contacted. A copy of the IRB permission was forwarded to the institution’s Office of Institutional Research and permission obtained. A query was run to identify new, incoming students enrolled in the college’s SDV class. These students were then sent an introductory email with a link to the survey. A \$100 gift card was offered as a raffle prize as an incentive to increase survey completion percentage. Each student who completely filled out the survey received an entry in the raffle.

The survey used the slightly modified Non-Cognitive Questionnaire shown on the IRB application and described earlier. Coding of individual responses is required for the NCQ based on well-defined heuristics determined by Tracey and Sedlacek (1984). Hierarchical linear regression analysis was conducted to determine relationships between scores on the NCQ scales, gender, race, method of placement into English and math classes, first semester GPA, and retention into second year.

It was necessary to determine the method of placement for each student respondent. Students can be placed into courses in English and math via SAT, ACT, previous college level work, multiple measures, or the VPT. For each student, the researcher looked up their method of placement one at a time in the college's information system after being provided access by the college's Institutional Research office. Because the only variables being examined in this study for the category type of placement were SAT, multiple measures, or VPT, some few students placed via ACT were removed from inclusion in the study.

### **Human Subjects Protection**

Subject demographic information and performance data were collected electronically and kept secure and encrypted on a password protected computer. The researcher followed the protocol for his graduate school's research and that of the institution where the research was conducted. Data will be stored for up to five years in a locked, private office, or alternative protected space, of the primary investigator. In addition, electronic data will be stored on a password-protected computer or another computer to which only the primary investigator has access. After five years, all digital files will be destroyed. Only the researchers will have access to the data. A copy of the Request for Exemption of Research Involving Human Subjects from Old Dominion University's Institutional Review Board Prior was received before students were

contacted. A copy of the IRB permission was forwarded to the Office of Institutional Research at the college participating in the study, and permission obtained.

### **Data Analysis**

The research used multiple regression to answer the research questions. The enter method, sometimes called the full method, was used where all independent variables were entered into the equation at the same time. Analyses were conducted using Statistical Package for Social Sciences (SPSS) software. To evaluate the research questions multiple linear regression were run with all eight NCQ factors (IV1, IV2 and IV3) as the independent variables and DV as the dependent variable. The independent variables analyzed was the eight noncognitive measures found on the NCQ, each of which was listed previously (Ancis & Sedlacek, 1997).

For the research questions  $R^2$  and standardized betas for the final regression model were assessed for small (.10), medium (.30), and large (.50) effect sizes. The model was deemed significant if  $p$ -value  $< .05$ . Variables were compared to one another to identify possible contributions to multicollinearity using Pearson's  $r$ , the most commonly used statistic for determining correlation (Leedy & Ormrod, 2015). At this conclusion of this phase, variables that contributed non-unique variability explanation were eliminated. GPA was entered first as the dependent variable for the first analysis, persistence to second year will be entered as the dependent variable for the second assessment. Several combinations of variables were run, but the block order of entered variables was consistently demographic variables, followed by noncognitive variables, and then type of placement. This was consistent with typical methods used by Sedlacek and other researchers' methodology (Sedlacek 2004; Ting, 2003, 2009; Tracey & Sedlacek, 1984). In each regression, the change at each step ( $R^2$ ) was assessed for significance

to find the most parsimonious model accounting for the change in cumulative GPA. This method is statistically conservative and minimized the potential for Type I errors (Strayhorn, 2013).

A predictive equation can be derived from a multiple regression analysis as follows:

$$\hat{y} = B^0 + B^1X^1 + B^2X^2 \dots B^nX^n$$

In this equation Y is the dependent variable, the X's represent the independent variables, and the B's are constants called regression coefficients, and n is the number of independent variables (Yen, 2018). In this study GPA was the dependent variable and was the Y in the equation for one set of equations; in another set the dichotomous variable of enrollment in second fall semester was the dependent variable. The regression equations were run again using Caucasian/Asian as a demographic variable in one set and underserved minority (USM) in the other.

I also tested to be sure the data met the assumptions of multiple linear regression and checked for multicollinearity (Chen, 2012). Multicollinearity may occur when two or more independent variables are highly correlated, possessing a strong linear relationship with each other. If multicollinearity was present, then it could have impacted the predictive results of variables on an independent level. Secondly, multiple regression assumes a normal distribution. The researcher checked for homoscedasticity and heteroscedasticity using scatterplots via SPSS. Lastly, multiple regression analysis has been found subject to error of the dataset being analyzed contains outliers, so SPSS contains a filter for analyzing and removing them. If this had occurred, it would have been noted in the section outlining the analysis procedures and results of the study.

Multiple kinds of hierarchical regression analysis are found throughout the literature in analyzing the predictive impact of bivariate data on student success. In most, the researcher

chooses the order in which the variables are entered into the equation. Usually, the first variable entered is the one accounting for the most variance, the next variable entered is the one accounting for the next largest amount of variance, etc. (Lomax, 2001). Block input of grouped variables is one common method, there are also the forward and backward methods. In blocked regression, for example, noncognitive traits such as gender, race and ethnicity, Pell-eligibility might all be entered as a block, as might type of placement. Stepwise regression is used throughout the literature on this topic and, though some researchers have argued against it as an effective measurement tool (Antonakis & Dietz, 2011; Cameron, & Trivedi, 2005) it is still commonly used (Adebayo, 2008; Olani, 2009; Schwartz & Washington, 2002; Thomas et al., 2007). Because of this disagreement, however, the “enter” method of regression was used.

Other research studies using multiple regression analysis sometimes used the stepwise method but there are reasons why the enter method was chosen instead. Stepwise regression evaluates the variables one at a time and removes those that don't meet the threshold for statistical significance. However, in a study such as the one described here, testing for a theory means maintaining the inclusion of the variables even if individually they do not rise to the level of significance. Together those variables can have a significant impact on the dependent variable (Smith, 2018).

The final report included descriptive statistics for the sample that includes placement method, race/ethnicity, and gender. The following tables provide the mean and standard deviation of each of the eight noncognitive variables, as well as the reliability and factor loadings for the eight NCQ scales, the predictive nature of the model, the significance of placement variables, race/ethnicity, gender, and hours worked. Hierarchical regression analysis analyzed each of the research questions in turn and the correlational matrix assessed multicollinearity.

### **Limitations**

Some students who take SDV 100 do not pass it the first time and may have been taking the course a second time, so there may have been some maturation affects either from going through the material a second time or gained by outside college experience. It is not unusual for students to change their desired program of study, including moving from a certificate program of study to a certificate program, or vice versa, and that will slightly affect the sample parameters. It may be that the way the survey was initially worded may have been confusing to some eligible students and the electronic survey was changed after the pilot study as follows. The original wording was “You must be older than 18 to complete the survey” and it was reworded to “You must be 18 or older to complete this survey.” Because this survey was conducted during the fall semester students who entered the community college in the spring semester were not among those studied.

Given that this study’s sample was derived from just one institution, caution should be exercised in any attempt to generalize the results to other community colleges or populations of students. It is possible that students at this college are different from students on other campuses in some important way. If this is the case, the data and analysis would likely be different from the norm in that same way.

### **Conclusion**

This section outlined the purpose and specific research questions that guided this study, as well as the project design and means used to answer those same questions. The results of the study will guide practice in combining cognitive and noncognitive assessments to assess the likelihood of community college student persistence. In the next chapter I report the findings of this study.



## CHAPTER IV

### RESULTS

---

In order to examine the predictive effects of noncognitive factors (e.g., resiliency, motivation, self-efficacy, etc.) on the academic performance of first year students at a mid-sized community college in Virginia, this study posed the following research questions:

1. To what extent do noncognitive factors predict first semester GPA for community college students above and beyond cognitive factors?
2. To what extent do cognitive and noncognitive factors predict fall-to-fall persistence for community college students?
3. To what extent do cognitive and noncognitive factors predict first semester GPA and fall-to-fall persistence for underserved minority students?
4. To what extent do noncognitive factors predict first fall-to-fall persistence for community college students above and beyond other factors?

#### **Description of the Participants**

The Institutional Research Office at the institution provided the researcher with a list of the students enrolled in the college's orientation course during the fall 2018 semester (N=256). This course is typically taken during a student's first semester and required for all Associates degree programs at the college. Incomplete surveys were removed as were the few received from students under the age of eighteen because of the difficulty in obtaining parental information and permission. Data on participants' gender is provided in Table 3.

**Table 3**  
*Descriptive Statistics of Noncognitive Variables*

<b>Gender</b>				
	Frequency	Percent	Valid Percent	Cumulative Percent
Female	167	65.2	65.2	65.2
Male	85	33.2	33.2	98.4
Other	4	1.6	1.6	100.0
Total	256	100.0	100.0	NA

Many of the claims for the benefits of the noncognitive questionnaire (NCQ) tout the advantage the survey offers institutions looking to assess incoming or existent students fairly. Female students made nearly two thirds of this sample and have become the majority of undergraduate students today. Underrepresented students are well known to generally score lower on traditional placement tests such as the SAT or ACT. Participants in the study were also analyzed by race as shown in Table 4.

**Table 4**  
*Participants by Race/Ethnicity*

<b>Race</b>			
	Frequency	Percent	Cumulative Percent
American Indian (Native American)	1	0.39	0.39
Asian	16	6.25	6.64
Black- African-American	35	13.67	20.31
Hispanic (or Latino)	23	8.98	29.3
Two or more	21	8.2	37.5
Unknown	1	0.39	37.89
White (of Hispanic origin)	159	62.11	100
Total	256	100	

Many community college students are first generation, a status that is associated with decreased likelihood of retention and graduation. In this study 93 students (36.3 percent) reported they were first generation and 163 students (63.7 percent) said they were not first

generation. Participants in the survey were placed into classes through either the Virginia Placement Test, Multiple Measures, some other method, or a combination between methods. In some cases it was not possible to determine the method of placement. For example, the student record in the student information system often would show not just their initial Math and English classes but several types of assessments. Sometimes these assessments were in conflict with each other. Occasionally it was easy to decipher which method was used for placement because a student's placement would correspond with one test but not for another. In other cases, two or more assessments, both seen alongside each other in a student record, would each lead to the same placement. For the purposes of this study, I placed that those cases in the third category along with students who were placed via prior college classes, SAT, ACT scores, or if it was impossible to determine their method of placement.

**Table 5**  
*Methods of Student Placement*

	Frequency	Percent	Valid Percent	Cumulative Percent
VPT placed	85	33.2	33.2	33.2
Multiple Measures placed	51	19.9	19.9	53.1
Combination/other/cannot determine	120	46.9	46.9	100
Total	256	100	100	

Note. VPT = Virginia Placement Test; MM = Multiple Measures

#### **Analysis of Research Question One**

Research question one examined the extent to which noncognitive factors predict first semester GPA for community college students above and beyond cognitive factors? The entire sample population (N = 256) was analyzed in SPSS (v.23) for this analysis. Descriptive statistics for the independent variables of population age, work hours, and the NCQ noncognitive variables are displayed in Table 6.

**Table 6**  
*Descriptive Statistics for NCQ Items, Age, and Work Hours*

	N	Minimum	Maximum	Mean	Std. Deviation
Age	255	18	60	21.61	7.39
Work_Hours_N	256	5	45	22.73	12.6
Positive_Self-Concept	256	6	19	13.38	2.31
Realistic_Self-Appraisal	256	4	14	10.46	1.86
Understands_and_Deals_with_Racism_Items	256	5	21	13.11	2.7
Prefers_Long-Range_Goals	256	2	8	4.88	1.27
Availability_of_SSPI	256	3	13	7.96	1.48
Successful_Leadership_Experience	255	1	13	8.94	2.01
Demonstrated_Community_Service	255	1	8	4.94	1.28
Knowledge_in_Field	255	2	6	3.47	0.89
Persist_GPA	256	0	4	2.14	1.53
Valid N (listwise)	254				

The NCQ scoring methodology was described in chapter three. It is worth noting that the average participant worked 22.73 hours while being a student and that many community college students are part-time learners. Because some of the NCQ factors are not simply additive their descriptive statistics cannot be easily compared. For example, scoring for racism is done by adding together questions 10, 17, and 21. Items 10 and 21 are scored negatively (see Appendix E) so that the minimum and maximum scores in Table 6 cannot simply be compared with each other in a way that a higher score means an applicant rated themselves higher. It could be exactly the opposite depending on the scoring key. The factor Availability of a Strong Support Person is derived from items 14, 23, and 24 but all three items are scored negatively. Thus, the mean scores above are meaningless as a tool for gathering useful information. Self-reported scores for Positive Self-Concept were more than five times greater than Knowledge in Field scores but that is merely an artifact of the scoring system just described (Appendix E). Later tables highlight results of multiple regression run to examine further the significance of these factors. In this way the raw data yield useful information. See Tables 7, 9, 10, 11, 12, 14, 15, and 16 for clarification.

**Table 7**  
*Analysis of Noncognitive Factors on First Semester GPA*

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.83	1.00		0.83	0.41
Positive_Self-Concept	-0.01	0.03	-0.02	-0.29	0.77
Realistic_Self-Appraisal	0.12	0.04	0.20	3.05	0.00
Understands_and_Deals_with_Racism	0.03	0.03	0.07	0.96	0.34
Prefers_Long-Range_Goals	0.01	0.06	0.01	0.08	0.93
Availability_of_SSPI	-0.08	0.05	-0.10	-1.55	0.12
Successful_Leadership_Experience	-0.03	0.04	-0.05	-0.69	0.49
Demonstrated_Community_Service	0.07	0.06	0.08	1.23	0.22
Knowledge_in_Field	0.16	0.08	0.13	2.08	0.04
VPT	-0.08	0.16	-0.03	-0.49	0.62
MM	0.13	0.19	0.04	0.68	0.50
Gender=Female	0.33	0.15	0.13	2.17	0.03
Gender=Other	0.83	0.58	0.09	1.43	0.15
URM	-0.36	0.16	-0.14	-2.24	0.03
First_Gen_N	-0.04	0.15	-0.02	-0.27	0.79
Work_Hours_N	-0.02	0.01	-0.17	-2.67	0.01
Age	0.03	0.01	0.18	2.89	0.00

a. Dependent Variable: 2018\_Fall\_GPA

Multiple regression was performed to assess the impact of the eight non-cognitive factors on first semester GPA. An ANOVA of the full model demonstrated statistical significance at the .01 level. Two of the individual noncognitive factors were also statistically significant at  $p < .05$ : Realistic Self Appraisal and Knowledge in Field both showed significance. URM, Gender Female, Age and Work Hours were also found to be significant. The skewedness of first

semester GPA was found to be  $-.341$  and the kurtosis was  $-1.43$ ; the scatterplot indicated a normal distribution.

### Analysis of Research Question Two

Research question two examined the extent to which cognitive and noncognitive factors predict fall-to-fall persistence for community college students? Table 8 summarizes descriptive statistics of student persistence fall 2018 semester to fall 2019. Of the 256 students in the sample, 153 re-enrolled the following fall.

**Table 8**  
*Percentage of Students Persisting Fall to Fall*

		Predicted		
		Fall to Fall Persistence		Percentage Correct
		0	1	
Fall to Fall Persistence	0	0	103	0.0
	1	0	153	100.0
Overall Percentage				59.7

a. Constant is included in the model.

b. The cut value is  $.500$

Multiple regression was run to assess the impact of the cognitive and non-cognitive values and Table 9 summarizes those results. In this table, column B represents the slope of the line between the independent and dependent variable(s). Column Exp (B) is the odds ratio.

**Table 9**  
*Multiple Regression Analysis for Fall-to-Fall Persistence*

	B	S.E.	Wald	df	Sig.	Exp(B)
Positive_Self-Concept	0.04	0.06	0.41	1.00	0.52	1.04

Realistic_Self-Appraisal	0.08	0.08	0.98	1.00	0.32	1.08
Understands_and_Deals_with_Racism	-0.09	0.06	2.44	1.00	0.12	0.91
Prefers_Long-Range_Goals	0.02	0.13	0.02	1.00	0.88	1.02
Availability_of_SSPI	-0.10	0.11	0.85	1.00	0.36	0.91
Successful_Leadership_Experience	-0.20	0.08	6.42	1.00	0.01	0.82
Demonstrated_Community_Service	0.00	0.11	0.00	1.00	0.97	1.00
Knowledge_in_Field	0.13	0.16	0.64	1.00	0.42	1.13
URM	-0.49	0.31	2.53	1.00	0.11	0.61
Age	0.01	0.02	0.30	1.00	0.58	1.01
First_Gen_N	-0.19	0.29	0.45	1.00	0.50	0.82
Work_Hours_N	-0.03	0.01	4.84	1.00	0.03	0.97
VPT	0.14	0.32	0.19	1.00	0.66	1.15
MM	0.49	0.39	1.57	1.00	0.21	1.63
Gender=Female	-0.03	0.30	0.01	1.00	0.92	0.97
Gender=Other	0.33	1.26	0.07	1.00	0.79	1.40
Constant	2.76	2.04	1.83	1.00	0.18	15.77

a. Variable(s) entered on step 1: Positive\_Self-Concept, Realistic\_Self-Appraisal, Understands\_and\_Deals\_with\_Racism\_Items, Prefers\_Long-Range\_Goals, Availability\_of\_SSPI, Successful\_Leadership\_Experience, Demonstrated\_Community\_Service, Knowledge\_in\_Field, URM, Age, First\_Gen\_N, Work\_Hours\_N, VPT, MM, Gender=Female, Gender=Other.

As indicated in Table 9, several factors were found to be significant at  $p < .05$ . These included Successful Leadership at .01 and Work Hours at .03. Successful Leadership Experience's B was negative .20 and African American or Black was negative .03. The skewedness of first semester GPA was found to be -.870 and the kurtosis was -.267; the scatterplot indicated a normal distribution.

### Analysis of Research Question Three

Research question three examined the extent to which noncognitive factors predict first semester GPA for USM community college students. In this analysis, majority students consisted of White and Asian students, while minority students consisted of African-American or Black, Hispanic or Latinx, or Two or more races.

#### Table 10

*Noncognitive Questionnaire Results of Multiple Regression Including Other Factors on Majority Students*

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-0.14	2.04		-0.07	0.95
Positive_Self-Concept	-0.01	0.07	-0.01	-0.08	0.93
Realistic_Self-Appraisal	0.14	0.08	0.19	1.68	0.10
Understands_and_Deals_with_Racism	0.03	0.07	0.06	0.45	0.65
Prefers_Long-Range_Goals	0.14	0.14	0.13	1.04	0.30
Availability_of_SSPI	-0.11	0.10	-0.12	-1.10	0.28
Successful_Leadership_Experience	-0.10	0.09	-0.14	-1.15	0.25
Demonstrated_Community_Service	0.08	0.12	0.08	0.68	0.50
Knowledge_in_Field	0.33	0.17	0.22	1.95	0.06
MM	1.20	0.46	0.29	2.62	0.01
Other	0.54	0.30	0.21	1.80	0.08
Gender=Female	0.15	0.33	0.05	0.44	0.66
First_Gen_N	-0.26	0.28	-0.10	-0.94	0.35
Work_Hours_N	-0.02	0.01	-0.20	-1.75	0.08
Age	0.03	0.02	0.15	1.37	0.18

a. Dependent Variable: 2018\_Fall\_GPA

Multiple regression was performed to assess the impact of cognitive and non-cognitive values on first semester GPA. For White/Asian students the only factor shown to be significant ( $p < .05$ ) was Multiple Measures at .01, B was positive 1.2. Knowledge in Field just missed significance at  $p = .06$ .

**Table 11**  
*Multiple Regression for First Semester GPA for USM Students*

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-0.14	2.04		-0.07	0.95



Positive_Self-Concept	-0.01	0.07	-0.01	-0.08	0.93
Realistic_Self-Appraisal	0.14	0.08	0.19	1.68	0.10
Understands_and_Deals_with_Racism_Items	0.03	0.07	0.06	0.45	0.65
Prefers_Long-Range_Goals	0.14	0.14	0.13	1.04	0.30
Availability_of_SSPI	-0.11	0.10	-0.12	-1.10	0.28
Successful_Leadership_Experience	-0.10	0.09	-0.14	-1.15	0.25
Demonstrated_Community_Service	0.08	0.12	0.08	0.68	0.50
Knowledge_in_Field	0.33	0.17	0.22	1.95	0.06
<b>MM</b>	<b>1.20</b>	<b>0.46</b>	<b>0.29</b>	<b>2.62</b>	<b>0.01</b>
Other	0.54	0.30	0.21	1.80	0.08
Gender=Female	0.15	0.33	0.05	0.44	0.66
First_Gen_N	-0.26	0.28	-0.10	-0.94	0.35
Work_Hours_N	-0.02	0.01	-0.20	-1.75	0.08
Age	0.03	0.02	0.15	1.37	0.18

a. Dependent Variable: 2018\_Fall\_GPA

These results derived from analysis of the records of underserved minority students. Regression analysis determined that Multiple Measures was significant at  $p = .01$  when assessing the impact on first semester GPA. Multiple Measures is a method of placement including high school GPA and completion of English or Math. No other factor was found to be statistically significant, although Knowledge in Field approached significance ( $p = .06$ )

#### Analysis of Research Question Four

Research question four examined the extent to which noncognitive factors predict fall-to-fall persistence for community college students above and beyond other factors. For this analysis other factors that impact student success were added. The results can be seen in Table 12.

**Table 12**

*Multiple Regression for Fall-to-Fall Persistence for USM Students*

	B	S.E.	Wald	df	Sig.	Exp(B)
Positive_Self-Concept	-0.01	0.13	0.01	1.00	0.91	0.99
Realistic_Self-Appraisal	0.17	0.16	1.15	1.00	0.28	1.19

Understands_and_Deals_with_Racism	-0.10	0.14	0.50	1.00	0.48	0.91
Prefers_Long-Range_Goals	0.07	0.27	0.07	1.00	0.79	1.07
Availability_of_SSPI	-0.30	0.22	1.90	1.00	0.17	0.74
Successful_Leadership_Experience	-0.14	0.17	0.66	1.00	0.41	0.87
Demonstrated_Community_Service	0.17	0.23	0.58	1.00	0.44	1.19
Knowledge_in_Field	-0.30	0.32	0.84	1.00	0.36	0.74
Age	0.01	0.04	0.09	1.00	0.77	1.01
First_Gen_N	-0.42	0.53	0.62	1.00	0.43	0.66
Work_Hours_N	-0.05	0.02	5.14	1.00	0.02	0.95
VPT	-0.12	0.57	0.05	1.00	0.83	0.88
MM	0.56	0.90	0.38	1.00	0.54	1.74
Gender=Female	-0.25	0.64	0.15	1.00	0.70	0.78
Constant	4.39	4.28	1.05	1.00	0.30	80.68

a. Variable(s) entered on step 1: Positive\_Self-Concept, Realistic\_Self-Appraisal, Understands\_and\_Deals\_with\_Racism\_Items, Prefers\_Long-Range\_Goals, Availability\_of\_SSPI, Successful\_Leadership\_Experience, Demonstrated\_Community\_Service, Knowledge\_in\_Field, Age, First\_Gen\_N, Work\_Hours\_N, VPT, MM, Gender=Female.

Regression was performed to assess the impact of a number of factors on the fall-to-fall persistence of underrepresented minorities. Only Work Hours was found to be significant at  $p = .02$ .

**Table 13**

*Fall-to-Fall Persistence Predicted by the Model for USM Students*

Observed	Predicted		Percentage Correct
	Fall to Fall Persistence	1	
Fall to Fall Persistence	0	1	70.3
Persistence	1	10	76.2
Overall Percentage			73.4

a. USM = 1.00

b. The cut value is .500

Table 13 shows the results when multiple regression was run to examine the effects of the noncognitive factors and other independent variables on fall-to-fall persistence of underrepresented minorities. This model accounts for 73.4% of performance.

**Table 14**  
*Multiple Regression Analysis for GPA and Persistence for White/Asian Students*

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.55	1.46		1.74	0.08
Positive_Self-Concept	0.07	0.05	0.12	1.44	0.15
Realistic_Self-Appraisal	-0.02	0.06	-0.02	-0.25	0.80
Understands_and_Deals_with_Racism	-0.01	0.05	-0.02	-0.25	0.80
Prefers_Long-Range_Goals	-0.05	0.09	-0.05	-0.54	0.59
Availability_of_SSPI	-0.07	0.08	-0.08	-0.88	0.38
Successful_Leadership_Experience	-0.16	0.06	-0.23	-2.68	0.01
Demonstrated_Community_Service	0.05	0.09	0.04	0.54	0.59
Knowledge_in_Field	0.10	0.12	0.07	0.86	0.39
Gender=Female	-0.17	0.23	-0.06	-0.74	0.46
Gender=Other	0.78	0.75	0.08	1.04	0.30
VPT_or_MM=2.0	-0.02	0.31	-0.01	-0.06	0.95
VPT_or_MM=3.0	-0.07	0.27	-0.02	-0.25	0.80
First_Gen_N	0.30	0.23	0.10	1.28	0.20
Work_Hours_N	-0.01	0.01	-0.10	-1.25	0.21
Age	0.05	0.02	0.25	3.09	0.00

a. URM = .00

b. Dependent Variable: Persist\_GPA

Multiple regression analysis in this instance was sorted by race. In this split run analyzing the White and Asian students it was found that Successful Leadership Experience at .01 and age (.02) were significant at  $p < .05$ . No other factors were found to be significant. The same analysis was undertaken for the underserved minority students (see Table 15).

**Table 15**  
*Multiple Regression Analysis for GPA and Persistence Sorted by Race*

	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
--	-----------------------------	---------------------------	---	------

	B	Std. Error	Beta		
(Constant)	0.19	2.77		0.07	0.95
Positive_Self-Concept	-0.07	0.09	-0.10	-0.83	0.41
Realistic_Self-Appraisal	0.21	0.11	0.24	1.89	0.06
Understands_and_Deals_with_Racism	-0.06	0.09	-0.10	-0.66	0.51
Prefers_Long-Range_Goals	0.10	0.19	0.08	0.57	0.57
Availability_of_SSPI	0.05	0.14	0.04	0.33	0.75
Successful_Leadership_Experience	-0.11	0.12	-0.13	-0.98	0.33
Demonstrated_Community_Service	0.07	0.16	0.06	0.46	0.65
Knowledge_in_Field	0.08	0.23	0.04	0.36	0.72
Gender=Female	-0.01	0.45	0.00	-0.02	0.99
VPT_or_MM=2.0	1.62	0.62	0.31	2.60	0.01
VPT_or_MM=3.0	0.55	0.41	0.17	1.34	0.18
First_Gen_N	-0.24	0.37	-0.07	-0.64	0.52
Work_Hours_N	-0.03	0.02	-0.23	-1.91	0.06
Age	0.04	0.03	0.18	1.54	0.13

a. URM = 1.00

b. Dependent Variable: Persist\_GPA

Multiple Regression analysis tested the impact of the independent variables on the dependent variables of first semester GPA and fall to fall persistence for underrepresented minorities ( $p < .05$ ). In this instance the only significant variable was students who were placed either through the Virginia Placement Test (VPT) or Multiple Measures 2.0 level. A second analysis was run using the slightly different method split file to address research questions three and four. In this case, the data were again sorted by race (see Table 16).

**Table 16**

*Multiple Regression for GPA and Persistence for USM students (version II)*

	B	S.E.	Wald	df	Sig.	Exp(B)
--	---	------	------	----	------	--------

Positive_Self-Concept	-0.01	0.13	0.01	1.00	0.91	0.99
Realistic_Self-Appraisal	0.17	0.16	1.15	1.00	0.28	1.19
Understands_and_Deals_with_Racism	-0.10	0.14	0.50	1.00	0.48	0.91
Prefers_Long-Range_Goals	0.07	0.27	0.07	1.00	0.79	1.07
Availability_of_SSPI	-0.30	0.22	1.90	1.00	0.17	0.74
Successful_Leadership_Experience	-0.14	0.17	0.66	1.00	0.41	0.87
Demonstrated_Community_Service	0.17	0.23	0.58	1.00	0.44	1.19
Knowledge_in_Field	-0.30	0.32	0.84	1.00	0.36	0.74
Age	0.01	0.04	0.09	1.00	0.77	1.01
First_Gen_N	-0.42	0.53	0.62	1.00	0.43	0.66
Work_Hours_N	-0.05	0.02	5.14	1.00	0.02	0.95
VPT	-0.12	0.57	0.05	1.00	0.83	0.88
MM	0.56	0.90	0.38	1.00	0.54	1.74
Gender=Female	-0.25	0.64	0.15	1.00	0.70	0.78
Constant	4.39	4.28	1.05	1.00	0.30	80.68

a. Variable(s) entered on step 1: Positive\_Self-Concept, Realistic\_Self-Appraisal, Understands\_and\_Deals\_with\_Racism\_Items, Prefers\_Long-Range\_Goals, Availability\_of\_SSPI, Successful\_Leadership\_Experience, Demonstrated\_Community\_Service, Knowledge\_in\_Field, Age, First\_Gen\_N, Work\_Hours\_N, VPT, MM, Gender=Female.

Multiple regression analysis examined the performance of students identifying as underserved minorities for GPA and fall-to-fall persistence. In this case the one factor that met statistical significance at  $p < .05$  level through multiple regression was work hours at .02.

### Summary

This chapter presented the results of descriptive statistics and statistical analyses used to address the research questions of the study. Logistic regressions were run to investigate the effects of the items on the noncognitive questionnaire on both GPA and fall-to-fall persistence. Additional factors were also analyzed including placement via SAT, multiple measures, gender, first generation in college, age, and hours worked. Because several of the research questions addressed differences across race/ethnicity, results were broken down into two groups: White/Asian and Black/African-American/Latinx/Pacific Islander/Two or more races. Results

indicated that some of the items on the NCQ were mildly predictive across race/ethnicity: Higher scores in Realistic Self-Appraisal and Knowledge Acquired in a Field were both correlated with higher GPA. As a student's self-reported score in each field went up so did that student's GPA.

Students who scored higher in Successful Leadership Experience were less likely to persist. This result was significant at  $p=.01$  and the negative slope of the relationship was an unexpected finding compared to the literature. Discussion about this finding along with possible explanations and recommendations follow in chapter five.

When broken down by race/ethnicity, no particular item on the NCQ questionnaire rose to significance for GPA but the method of placing students through multiple measures was both positive and significant. When both GPA and persistence were looked at by race/ethnicity, none of the noncognitive factors were significant but work hours were. Underserved minority students who reported they worked longer hours were less likely to persist. It was not found that SAT scores or high school grades, both typical predictors of college GPA and persistence, were significant in this study for students identifying as White/Asian or Black/African-American/Latinx/Pacific Islander/Two or more races. Chapter five will discuss further these results and what they mean.

A correlation matrix was run to assess multicollinearity between the items on the noncognitive questionnaire and found that while there are some small relationships between factors, none rose to the level of significance (see Appendix F). Furthermore, an analysis of the data was run to determine skewness and kurtosis and ensure the distribution was fit for regression analysis. The fifth chapter will discuss the findings of the analyses in the context of the related literature, outcomes, recommendations for practitioners and leaders, and suggestions for future research.

## CHAPTER V

### DISCUSSION

The large majority of students at community colleges do not earn the degree they seek (Jenkins & Fink, 2016; Mullin & Phillippe, 2013; Schuetz, 2008; Windham et al., 2014). One key reason appears to be placement into developmental coursework (Bailey, 2009; Bailey et al., 2010; Clotfelter et al., 2015; Fong et al., 2015). Researchers have also long examined the differences between the general community college student body and those who start at four-year colleges or universities to discover other reasons to explain the difference in completion. The goal being, of course, better recognition of which students might struggle to improve the outcomes for students at both types of institutions.

Tracey and Sedlacek (1984, 1989) developed the Noncognitive Questionnaire to help assess and predict the retention of college students with a specific focus on designing a tool that would help more accurate selection and admission of minority students. This is a laudable goal, of course, and several studies have demonstrated the validity of noncognitive measures in applicant selection (Crede & Kuncel, 2008; Flowers, 2015; Reid & Moore, 2008; Sedlacek, 2004; Ting, 2009; Ting & Sedlacek, 2000; Tucker & Mcknight, 2019).

#### **Purpose Statement and Research Questions**

This study sought to add to the literature by combining traditional cognitive and non-cognitive measures to yield a better predictive model of predicting community college student success as defined by first semester GPA and fall-to-fall persistence. Since most assessments of the noncognitive questionnaire chosen have been conducted on four year college or university students, this research also examined the predictive nature of this instrument itself on community

college students. The results differed for each dependent variable and are reviewed in this chapter.

Four research questions guided this study:

1. To what extent do noncognitive factors predict first semester GPA for community college students above and beyond cognitive factors?
2. To what extent do cognitive and noncognitive factors predict fall-to-fall persistence for community college students?
3. To what extent do cognitive and noncognitive factors predict first semester GPA and fall-to-fall persistence for underserved minority students?
4. To what extent do noncognitive factors predict first fall-to-fall persistence for community college students above and beyond other factors?

### **Summary of Methodology**

Participants in this study were students at a mid-size community college in Virginia who were enrolled in fall 2019 in a student orientation class. This class is required for every Associates degree at the college and recommended by both curriculum and staff academic advisors that it be taken in a student's first semester. Students were incentivized by orientation class instructors and offered a chance at Amazon gift cards for participation. They were provided an explanation of the study, contained within an informed consent document, and given an electronic link to complete the survey. Students who had not completed the survey by a certain date within the semester were reminded by their instructor and, in some cases, provided the survey link again.

Participant information was gathered by the college's Office of Institutional Research under the terms spelled out in pre-study documents and then provided to the researcher. Scoring



the slightly modified noncognitive questionnaire followed the guidelines provided by the designer of the instrument. Self-reported scores were either quantitative or qualitative. Qualitative answers were reviewed and scored as instructed to maintain the validity of the instrument. The slight modification of the instrument was necessary to customize it for community college students since a few of the questions were better tailored for four-year college or university students.

Finally, the researcher was able to examine the student information system data to ascertain the method by which these students were placed into English and Math classes. The community college studied was in the process of switching from one method of placing students into developmental or college level English and Math to a pilot project using multiple measures. In essence, the multiple measures method used a combination of high school GPA and completion of certain math courses while in high school to determine placement. As shown in Table Four it was impossible to determine the placement method in the majority of students examined because the college's student information system collected on many students not only SAT results, but also high school GPA, courses completed, and other possible placement methods including the ACT or GED. It was possible to determine that of the 256 students analyzed, 89 were placed via SAT scores and 51 via multiple measures.

After the participating students were coded and scored according to the scoring system tool devised by Sedlacek and Tracy, the researcher populated a spreadsheet that include all the students' demographic information, placement test information, and answers to a few questions not linked to the eight noncognitive factors being examined. These data were then used to run both descriptive statistics and multiple regression analyses in SPSS. Analyses were run using

multiple regression on the NCQ factors as well as race, gender, method of placement (SAT or multiple measures), and hours worked per week.

### **Summary of Results**

The first research question looked at the impact on first semester GPA of noncognitive factors over and above cognitive factors. Two of Sedlacek's items were found to be statistically significant. Realistic Self-Appraisal  $p=.003$  and Knowledge Acquired in Field  $p=.039$ . The *B* value for both factors was positive, indicating a positive correlation. As a student's self-reported score in each field went up so did that student's GPA.

The students who scored more highly in the Realistic Self-Appraisal area gave themselves higher ratings to such questions as "It should not be hard to get a B (3.0 GPA) at (name of school)" and "I am as skilled academically as the average applicant to (name of school)." Although the average GPA at the institution where this study was conducted is very close to 3.0, community colleges are traditionally open access, and many students enter with a high school GPA less than that number. A truthful and realistic answer to the prior questions, therefore, may indicate the participant thinks it will be hard for them to earn a B grade based on their previous high school experiences. Previous research by Webb et al (1997) showed that for Black female medical students a realistic assessment of the difficulty of academic work was correlated with later grades. This is demonstrably a different population than the general community college student and may be a large reason the results differed from those found in this study.

Students who scored higher in Knowledge Acquired in Field, sometimes referred to as Nontraditional Knowledge, rated themselves higher to queries such as: "List offices held and/or groups belonged to in high school or in your community." Higher scores were awarded to

answers where leadership was required to fulfill that role or prior leadership was required to obtain that role (i.e., student council). Students scored highest in the factor Knowledge Acquired in a Field when listing offices and/or groups held in high school or in the community that were directly or indirectly tied to education. If their answer was left blank, was vague, or not at all school related they were scored lower.

One of the prime tenants behind the development of the NCQ was a belief that underserved minority students are equally capable of doing well academically in college but not well served by the SAT or other current standard measures of aptitude. A wealth of scholarship exists criticizing the SAT for being merely reflective of cultural and social class biases, and subsequently not an enlightened choice to predict underserved minority achievement (Freedle, 2003). This particular factor, Knowledge in a Field, was included to address the predictive nature nontraditional learning has on the academic success of certain groups (Ting, 1997; Tracey & Sedlacek, 1984,1989, 2004).

The second research question examined how the studied cognitive and noncognitive factors predicted persistence from fall-to-fall semester. Retention from one year to the next is a paramount concern at community colleges where the annual dropout rate often exceeds 50 percent (SREB, 2003). Summers (2003) is among many researchers who have found that students who failed, withdrew from a course, or enrolled late were less likely to persist. This includes the finding that students who scored one grade level higher in their cumulative GPA were 45.9% more likely to re-register for the spring semester. This finding connects research questions one and two as logically students who re-enroll from fall to spring are more likely to return for a second fall semester than those who did not.

Regression analysis demonstrated that only one of the NCQ factors were statistically significant and correlated with student persistence from fall-to-fall semester. Successful Leadership was significant at  $p=.01$  and negatively correlated with persistence. Students who rated themselves high in this area answered statements such as “I am sometimes looked up to by others” and “In groups where I am comfortable, I am often looked to as a leader.” Leadership traits were associated with academic success for underserved students and/or students in special support programs (Ting, 1997; Tracey & Sedlacek, 1989; White & Sedlacek; 1986). Students who are African-American/Black also were found less likely to persist to the following fall semester.

Community college students differ from their traditional four-year counterparts in many ways. They are disproportionately minority, lower-income, and first-generation students. A higher percentage of them are first generation. In addition to work outside school they occupy caretaking roles such as parent, grandparent, or spending time caring for other family members. It is highly conceivable that community college students who score themselves higher on the leadership scale occupy non-academic roles such as lower management in restaurant or retail jobs where the hours or responsibilities detract from their college performance. A student occupying a supervisory level work position may also have a different concept of themselves, less as a student and more as a manager. It can easily be surmised how the immediate needs of a workplace situation, such as covering a shift for a low-wage employee who did not show up, take precedence over less immediate needs such as studying for next week’s exam or working on a paper due later that month.

The third research question assessed the impact of cognitive and non-cognitive factors on the first semester GPA of underserved minorities. The NCQ was designed to provide a counter

narrative for special populations to traditional cognitive measures. Thus, it was hoped that an effect would show after an examination of this segment of the student population. After multiple regression analysis, the only factor shown to be significant ( $p < .05$ ) was Multiple Measures at .01,  $B$  was positive 1.2. To understand this result it is necessary to examine more closely how this placement tool was used in practice. According to data published by the College Board in 2019 64 percent of graduating seniors took the SAT, which at that time was still required by most four-year colleges or universities. One possible confounding variable is that students who take the SAT may differ from those who do not. When a student's SAT score is high enough to place a student into college level coursework no examination of the student's high school GPA or math course completion is required. When there is no SAT data presented or the SAT score is lower than college level than those other criteria would be examined for placement. Conversely when the high school GPA and math course completion are high enough to ensure placement in college level coursework no examination of an SAT is required. Both high school performance and SAT scores are well known predictors of student success in college; therefore, it is notable that only one of the two (multiple measures) demonstrated a significant impact on first semester GPA.

The fourth research question examined the extent to which noncognitive factors predict first fall-to-fall persistence for underserved community college students above and beyond other factors. None of the NCQ factors were found to be significant though the model combining all of the referenced factors did explain 73.4 percent of fall-to-fall persistence. Again, the only factor that was significant was work hours ( $p=.02$ ) and again the correlation was negative ( $B=-.05$ ). USM students who worked more hours were less likely to persist than those who communicated that they worked fewer hours.

When GPA and fall-to-fall persistence were considered together, further examination by race showed that for the student group of White and Asian students the NCQ factor of Successful Leadership experience was significant ( $p=.01$ ) and that it again was the negative ( $B= -0.2$ ). Race/ethnicity was found to be significant for USM students with  $p = .026$  and  $B = -.36$ . Number of hours worked at a job, not including schoolwork, was also significant at  $p = .008$  and  $B = -.02$ . These results tally with previous research demonstrating the achievement gap between URM students and majority White/Asian Students. Likewise, the impact that working many hours outside of college has on academic performance (i.e., GPA) is unsurprising. Underserved minority students often have unmet financial need and fewer resources in terms of family income and assets and therefore may need to work or choose to work more hours outside school to pay expenses, thus diverting time away from study. Students of both majority and minority groups who scored higher for Successful Leadership experience were shown more likely to struggle academically, as defined by GPA or a combination of GPA and persistence. This finding may indicate the presence of a confounding variable: socioeconomic status.

For USM students, those who either took the Virginia Placement Exam (VPT) or scored into developmental education through placement in the lowest triad of the multiple measures system was found to be significant at  $p=.01$ . There are systematic differences in those who take the VPT versus the SAT. The VPT, use of which has been discontinued by the VCCS since this study was begun, was a homegrown test devised solely for the purpose of placement in VCCS English and Math courses. Students possessing either high enough results on the SAT or who would be placed into college level courses through multiple measures generally would not take the VPT, though it used to be used more widely as an assessment for all local high school students interested in pursuing dual enrollment in college courses while in high school.

Age was another significant factor, and it was positively correlated, showing that as our examined student's age increased so too did their GPA and persistence. Maturity, motivation, increased time management skills, and more stable financial footing are all possible and interrelated explanations.

For the first and second research questions, adding noncognitive factors to traditional cognitive assessments did not greatly aid in predicting GPA or persistence. As shown, very few of the NCQ factors themselves were found to be significant predictors of academic success for the community college population. Analysis of combined cognitive and noncognitive factors yielded a model for USM students that predicted 73.4% of persistence correctly. It is unknown what percentage of that number is due to the noncognitive factors versus work hours, gender, race/ethnicity, SAT's or other placement assessments. The results of the regression analysis in this study, while not large, do increase the extent to which the model is able to use the predictor/independent variables (the Non-Cognitive Questionnaire factors) to explain the variation in the dependent variables (GPA and retention to second year).

A correlation matrix (Appendix F) was run to examine the relationships between the eight factors on the NCQ. Analysis of the matrix using the Pearson correlation coefficient where the closer the number is to 1.00 the stronger the relationship and items can be related either positively or negatively. The matrix showed only weak to moderate relationships between the variables with none exceeding .52.

### **Discussion**

The most notable finding in the study is what did not appear. Contrary to most of the published studies using the NCQ as an evaluative tool predicting or assessing student success measures (Adebayo, 2008; Fuertes & Sedlacek, 1994; Noonan et al., 2005; Sedlacek, 2003, 2004; Sedlacek & Adams-Gaston, 1992; Ting, 2000, 2003, 2009;), few of the eight cognitive

factors were found to be significantly correlated with community college student GPA in the first semester or fall-to-fall persistence. Additionally, one of the noncognitive factors positioned to be a positive, Leadership Experience, was negatively correlated with persistence. In other words, students who rated themselves higher for leadership experiences were less likely to remain into their second year.

Noncognitive factors Realistic Self-Appraisal and Knowledge Acquired in Field mattered in terms of first semester GPA. These results were across race and ethnicity. The latter finding was robust enough though that when broken out by race, Leadership Experience was significant for Whites and Asians as predictive of both GPA and persistence – and again it was negatively correlated. This finding was counter to previous studies and thus merits further examination.

Community colleges were built on the notion that they provide a means for students of merit regardless of race, gender, ethnicity, first-generation status, or socio-economic status to access the post-secondary educational system. Compared to private four-year university options they are remarkably affordable and educate a disproportionate share of the nation's underserved minorities, who are often from families lower on the socioeconomic scale. As open access institutions they have confronted public skepticism, criticisms of dreams deferred, of being maintainers of a two-tiered class structure. The days of nearly one in two entering students being compelled to register for long sequences of developmental education are ending, but students still do arrive at the open door sometimes ill equipped for academic success. Accurate placement has long been the focus of community college assessments, not admittance. Because most of the research on the NCQ has been done on students at four-year institutions it is important to consider whether it is as useful a tool for community colleges.



Although only three of the eight factors of Sedlacek's NCQ were statistically significant across all measures of GPA and persistence, taken together and added to traditional cognitive assessments they did provide a slightly more predictive model. Care must therefore be taken when discussing these results and the discussion should include an examination of the statistical method used in the analysis. For example, many studies assessing the impact of the NCQ factors find either individual factors significant or the instrument significant. But Thomas et al. (2007) conducted a meta-analysis of research using the NCQ as a predictive instrument for college admission/placement using multiple regression for the analysis. The authors did not find statistical significance for any individual factor and warned that small individual factors, themselves insignificant, will add up throughout the model to increase the magnitude of the multiple  $R$ , leading to a possible erroneous conclusion as to its significance. Their recommendation, while careful to note the positive contributions of some cognitive factors towards predictive college admissions decisions, is that practitioners do not utilize the NCQ tool for this purpose. For community college professionals, the question is not one of selective admission but how useful is the tool for predicting student success.

### **Findings Related to the Literature**

The results of the current study help add to the body of research on the applicability of the NCQ to today's college student, particularly the community college student. Previous research, perhaps because of a reliance on a different student population, largely showed that the NCQ was predictive of student success in academic settings including medical schools, PWI's, and special populations including athletics, engineering, and nursing programs. These studies, along with a host of dissertations, typically took place at a single four-year college or university. This is clearly easier on the researcher(s), but it might be that such studies contain more

knowledge about that particular college or university and its student population than a larger sample across universities would provide. Furthermore, there is a well-known bias for peer reviewed academic journals to publish studies that show positive, significant results versus those that do not find significant results or those that replicate previously published work (Duyx et al., 2017).

Not all researchers, even those conducted at one four-year university, have found positive linkages between the NCQ and student success metrics or other assessments of noncognitive factors and student success. One such study conducted at the University of Missouri-Columbia, was tested using a population of conditional admit students that in some ways would be similar to community college students. None of the factors reached significance when correlated with GPA, retaining to second year, or graduation within a five-year time period (Orscheln, 2012). In research conducted with Hispanic students at a predominantly White four-year university, the researchers conceded that traditional academic variables might be the most predictive measures of student success for this population (Sedlacek & Fuyertes, 1995). In another study, Black males who were students at a largely White university did not return significant results on the NCQ scales (Schwartz & Washington, 2002), but Black males at a high school studied using the NCQ did (Powell, 2018). In that case, Leadership Experience, Realistic Self-Appraisal, and Availability of a Strong Support Person were all found correlated to academic success. Those results were similar to the ones found in the current study. It may well be that research into noncognitive factors using a high school population yields more usable information on community college students than studies on traditional college or university student populations.

One surprising finding in my study contrasted with the results of previous studies using the NCQ. While Successful Leadership Experience was significant, it was negatively correlated

with fall-to-fall persistence ( $B = -.20$ ). Work hours ( $B = .03$ ) was also negatively correlated. The latter finding is not unexpected, community college students often work many hours per week, and this has been well documented to be negatively linked with academic success. Explaining the contrary results of the successful leadership experience for community college students requires a little more theorizing.

As noted previously, the body of research involving the NCQ is based on student populations attending four-year colleges or universities. One notable exception is Noonan et al. (2005), who examined NCQ factors' impact on first semester GPA and subsequent semesters using a community college population. They too found that leadership was significant, along with community involvement and availability of a strong support system; results that this study did not find. Unfortunately, it is unknown whether their correlations of leadership with GPA was a negative or positive one.

Of the sample of students who participated in the current study, 39.8% did not return for the following fall semester and the NCQ noncognitive factor Leadership Experience was negatively correlated. There are many possible explanations for such a paradoxical result. It could well be that students who rate themselves higher in this regard are more likely to transfer to a four-year college or university and not return to the community college. These results may be different from most published studies using the NCQ because the typical four-year student would not be transferring. Future researchers who use the NCQ to examine the performance of community colleges may wish to confine their study to competitive career and technical degrees from which most students would be unlikely to transfer while in the middle of the program. Researchers could also build into their model a method of tracking those students who have transferred through using the National Student Clearinghouse.

When this finding was examined further by breaking down the results by race, the finding was only significant for students identifying as White or Asian ( $p < .006$ ). In this case, further explanations could include the possibility that students of different races systematically differ in how they answer the questions related to this noncognitive factor or it could be that race itself is a factor in the availability of leadership experiences.

The model for fall-to-fall persistence for USM students successfully predicted 73.4% of returning students but left more than 25 percent unaccounted for. Future researchers in this area must wrestle with trying to explain more of the missing pieces. The more predictors that can be known for specific populations helps future leaders attempting to genuinely solve problems with data instead of guesswork.

### **Recommendations for Practitioners and Leaders**

Since asking too many questions or requiring the completion of too many surveys can be seen as an obstacle, institutional leaders must wrestle with balancing the need to obtain useful information from incoming students versus creating barriers to enrollment. Placement tests have been dropped in lieu of placement via SAT, ACT, high school grades and course completion. Asking community college students to complete the NCQ, even in the context of a first semester orientation class, does not seem to yield enough useful information to merit the time and effort. In much the same way as college leaders, our community college students must maintain the tricky equilibrium between the needs of post-secondary education and the demands and opportunities of life. Seeking to gain a foothold in tomorrow's economy, these students are still very much today's workforce. In addition to being students, they may be parents or family caretakers, coaches, and/or involved in religious or civic duties.

Tinto's (1970) model of student engagement is still very relevant for community college leaders as well as university officials. How much a student sees themselves a part of their educational institution *despite their other obligations* matters in terms of their educational performance. Sedlacek's factor of realistic self-appraisal, assessing one's strengths and weaknesses and allowing for self-development (2004) can be thought of as a precursor to the current model of growth mindset (Dweck, 2007). Or even older, Aristotle's injunction to know oneself. This finding about the importance of making an accurate assessment of one's abilities cut across racial lines. Grades, of course, are a method by which faculty provide assessment of student performance but are not necessarily an accurate portrayal of capability. In the hands of higher education practitioners hoping to understand and welcome their incoming students they are both a predictive tool and a snapshot of a past moment in a student's life. This study sought to learn which noncognitive factors are missing pieces of the puzzle and how important those pieces are to the overall picture.

The following are recommendations for how practitioners can best utilize the findings of this study:

1. Help students develop a realistic self-appraisal since that was correlated with first semester GPA in a positive direction. Meetings with academic coaches, tutors, assessing strengths, building schedules with time blocked for study are all promotable practices. Orientation courses have long been adopted by higher education in the effort to help onboard and engage incoming students (Cueso, 1997). These classes can become a dumping ground for anything and everything thought to benefit newcomers so leaders of these efforts must be judicious with what to include. It might be well though to develop a unit in orientation courses focused on helping students

- develop resiliency and emotional intelligence, since all of the together may aid in the development of a student body more able to know themselves and therefore make sound decisions about the challenges they undertake.
2. College leaders should advocate for the implementation of a proficiency-based curriculum in recognition of the unequal footings that underlie the lived experience of the student body. Such a curriculum allows for the incremental nature of growing knowledge as well as growing confidence. Often these are associated with a commensurate gaining in chronological and emotional maturity. Students with lower high school GPA's were less likely to persist fall-to-fall; they must be given time for growth and progress. The teaching of Carol Dweck's growth mindset or similar theories that promote hope among students who have heretofore struggled out to be required pre-requisite reading. There must be recognition of the widespread nature of self-doubt and imposter syndrome, particularly during today's post-Covid atmosphere of anxiety and depression, and particularly among underserved minorities. Implementing this change would allow for students to see tangible results to repeated attempts and rewards persistence, encouraging growth. This practice, informed by research showing that underserved minorities and lower income college students are often working many hours outside of their college studies, acknowledges inequalities while keeping equal the expectation for learning.
  3. Increase available resources to address unmet financial needs. Community college students work a lot of hours outside of school as has been well documented, and living expenses incurred while in college are larger than the relatively affordable tuition and fees. First generation students and underserved communities often have

fewer family resources to meet this need, which may explain the correlation between work hours and retention, and why this is more significant among these populations. There is growing momentum for eliminating the tuition for community colleges with more than half the states having programs for two or four-year institutions. Students work to pay many more expenses than just tuition so removing the cost of the tuition may do little to address disproportionate working hours. This is especially true at community colleges where existing financial aid programs entirely cover the cost of tuition, fees, and books. The costs of non-college expenses is where the problem arises. Resources such as food pantries address food insufficiency while wellness and counseling programs address student's mental and physical health needs. Federal work-study positions and paid part-time employment for students on or off campus are strategies that can make further inroads in keeping the role of student to the forefront.

4. Be extremely judicious in the awarding of leadership opportunities. This seemingly paradoxical result showed students' self-reported higher scores for leadership experience negatively correlated with student persistence and in some cases, GPA. While this finding merits further investigation, it may well be that students who take on too much become overwhelmed and drop out. Students doing well in management at the workplace may also begin to value either their studies or the perceived future benefits of college less. Instead, college leaders should choose to promote widely and often the advantages of a college degree. Opportunities for leadership should be presented to a range of individuals and their well-being carefully monitored.

5. Design sequences of courses that encourage students to take as many courses per academic term as they can reasonably handle. Courses should be offered in multiple delivery formats (online, hybrid, in-person) and also at times that center student needs above faculty convenience (morning, evening, and weekend offerings. Faculty need to be encouraged to make information available to students with varying degrees of access to time on task and technology. This does not remove the responsibility of the student to complete the work well, but instead is aimed at equalizing access for students of all backgrounds.

These recommendations are not just directed at community college leaders. Though they may be most applicable there, leaders of four-year colleges or universities also have students with similar issues, and, as the number of high school graduates continues to decline in America due to demographics, there will be more and more academically under-prepared students enrolling at four-year institutions.

Because those students are existing among a more affluent student body, their lack of resources may even feel more acute by comparison, the school may not have existent programs for them to access, or they may feel uncomfortable asking for help. It is important that all schools be proactive and widespread in their approach to disseminating information about supportive resources.

### **Suggestions for Future Research**

More research is clearly needed to develop a fuller picture of which noncognitive factors are most predictive of student success in community colleges. And because there are mixed results, it may be that the NCQ is not the most attractive instrument to assess that likelihood, or that it needs to be studied in conjunction with other factors such as Pell fund eligibility,



educational attainment of the student's parents or guardians, or other tests designed to test the large group of characteristics known as noncognitive factors. Information on Pell fund eligibility, or some other assessment of a student's socioeconomic status, would be very useful to obtain more information about the somewhat surprising seeming results from this study about the negative correlation with the NCQ factor Successful Leadership Experience and GPA/Persistence. Other tests such as the Student Readiness Inventory, the College Student Inventory, Student Adjustment to College Questionnaire, and the Community Survey of Student Engagement are more modern and already in wide usage. For future researchers, the Community College Research Center has a list of over 20 available options (Kafka, 2016).

Further research using the NCQ could inform community college practitioners which noncognitive factors are most important for incoming or existing community college students. These factors would then be part of the answer of why some students struggle or drop out, others flourish, and most of the others meander a course between the two poles. Such knowledge would be used to inform program development and institutional consciousness about the background, successes, and struggles of the student body. In our zeal to improve outcomes, we must be mindful not to trample on the strengths and insights of the underserved minority groups whose voices may not be fully recognized. Our approach must be an inclusive one, borne of a desire to see all students achieve their goals.

High dropout rates in community colleges suggest that future research should use a longer timeline to evaluate student success or look beyond the metrics of graduation, GPA, or persistence. Very few students at community colleges take full time enrollment or graduate in two years. Many stop out for a semester or years along the way. Though their achievements may

be harder to measure, these typical community college students should not be excluded because of somebody else's definition of success.

Other methods of performance may be trickier to capture but reveal a more accurate picture. Guidelines for financial aid require that a student be enrolled and taking classes towards a degree or certificate, thus ensuring that a savvy student dependent on financial aid to take classes, enroll themselves in a credential that they never intend to complete at that institution. Further research could inform college presidents and decision makers about where to allocate resources to increase retention. Since some of these programs are known to be quite expensive per participant (i.e., Project ASAP), leaders must be certain of the specific applicability of measurements to their populations so as to be as confident as possible that they will see the anticipated results. Additional research into community college populations that combine known cognitive predictors (GPA, SAT, ACT) with noncognitive factors, but not necessarily the NCQ, seems reasonable.

### **Conclusion**

Since this research was conducted the VCCS has continued to move away from standardized placement tests and mandated the use of multiple measures for placement of students within five years of their high school graduation. Students further removed from high school are doing informed self-placement – which generally means that very few of them place themselves into developmental education. It may be that the era when the NCQ might have been useful for placement into classes is ending for now but not permanently ending. Interest into the noncognitive factors that predict attrition remains high.

Post pandemic, the large percentage of community college students choosing online learning means that traditional forms of engagement are difficult to enact and achievement gaps

are widening. Understanding why some underserved minority students are struggling to persist is critical. A growing number in our nation, some of them elected officials, are questioning not only the impact of community colleges but the very value of post-secondary education. At the same time, community colleges have never had so highly placed an advocate as Dr. Jill Biden, still actively teaching, nor a president so openly committed to funding their free access.

Continued recognition of the cognitive and noncognitive factors that are predictive of which students will succeed and which will struggle is imperative. If community colleges are to fulfill our mission as the educational engine of social mobility, we must find a way to help more of our aspiring graduates achieve their goals. Further, we must work towards changing the conditions such as economic inequality that place unequal burdens on our underserved minorities who ask merely for the same opportunity to realize their potential.

## REFERENCES

- AACC (American Association of Community Colleges (2019). Fast Facts, 2019.  
<https://www.aacc.nche.edu/wp-content/uploads/2019/03/AACC-2019-Fact-Sheet-1.pdf>
- Acevedo-Gil, N., Santos, R. E., Alonso, L., & Solorzano, D.G. (2015). Latinas/os in community college developmental education: Increasing moments of academic and interpersonal validation. *Journal of Hispanic Higher Education, 14*(2), 101–127. doi: 10.1177/1538192715572893
- Adebayo, B. (2008). Cognitive and non-cognitive factors. *Journal of College Admission, 200*, 15–21.
- Adelman, C. (1999). *Answers in the toolbox: Academic intensity, attendance patterns, and bachelor's degree attainment*. US Department of Education. Office of Educational Research and Improvement.
- Allen, J., Robbins, S. B., & Sawyer, R. (2010). Can measuring psychosocial factors promote college success? *Applied Measurement in Education, 23*(1), 1-22.  
 doi:10.1080/08957340903423503
- Ancis, J. R., & Sedlacek, W. E. (1997). Predicting the academic achievement of female students using the SAT and noncognitive variables. *College & University, 72*, 2–8.
- Astin, A. (1971). *Predicting academic performance in college*. The Free Press of Macmillan.
- Astin, A. (1975). *Preventing students from dropping out*. Jossey-Bass.
- Astin, A. (1977). *Four critical years: Effects of college on beliefs, attitudes, and knowledge*. Jossey-Bass

- Astin, A. W., Tsui, L., & Avalos, J. (1996). *Degree attainment rates at American colleges and universities: Effects of race, gender, and institutional types* (Report No. HE 029589). Higher Education Research Institute (ERIC Document Reproduction Service No. ED 400749).
- Attewell, P., Lavin, D., & Domina, T. (2006). New evidence on college remediation. *Journal of Higher Education*, 77(5), 886–924.
- Antonakis, J., & Dietz, J. (2011). Looking for validity or testing it? The perils of stepwise regression, extreme-scores analysis, heteroscedasticity, and measurement error. *Personality & Individual Differences*, 50(3), 409–415.
- Bahr, P. R., Fagioli, L. P., Hetts, J., Hayward, C., Willett, T., Lamoree, D., Newell, M. A., Sorey, K., & Baker, R. B. (2019). Improving placement accuracy in California’s community colleges using multiple measures of high school achievement. *Community College Review*, 47(2), 178–211.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman
- Bailey, T. (2009). Challenge and opportunity: Rethinking the role and function of developmental education in community college. *New Directions for Community Colleges*, 145, 11-30.
- Bailey, T., Jeong, D. W., & Cho, S.-W. (2010). Referral, enrollment, and completion in developmental education sequences in community colleges. *Economics of Education Review*, 29(2), 255–270.
- Barbitta, S., & Munn, W. (2018). Multiple measures placement in North Carolina. *New Directions for Community Colleges*, 2018(182), 59–73.
- Beatty, A., Greenwood, M. R. C., & Linn, R. L. (Eds.) (1999). *Myths and tradeoffs: The role of tests in undergraduate admissions*. National Academy Press

- Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*, 485–540.
- Bennett, C. I. (2002). Enhancing ethnic diversity at a Big Ten university through Project TEAM: a case study in teacher education. *Educational Researcher, 31*(2), 21–29.
- Bettinger, E. P., Evans, B. J., Pope, D. G., & National Bureau of Economic Research. (2011). Improving College Performance and Retention the Easy Way: Unpacking the ACT Exam. NBER Working Paper No. 17119. In *National Bureau of Economic Research*. National Bureau of Economic Research.
- Bickerstaff, S., Barragan, M., & Rucks-Ahidiana, Z. (2017). Experiences of Earned Success: Community College Students' Shifts in College Confidence. *International Journal of Teaching & Learning in Higher Education, 29*(3), 501–510.
- Bowen, W. G., & Bok, D. C. (1998). Why race-conscious admissions make sense. *College Board Review, 186*, 8.
- Bridgeman, B., Burton, N., & Cline, F. (2003). Substituting SAT II: Subject tests for SAT I: Reasoning: Impact on Admitted Class Composition and Quality. *Research in Higher Education, 44*(1), 83–98.
- Brint, S., & Karabel, J. (1989). *The diverted dream: Community colleges and the promise of educational opportunity in America, 1900-1985*. Oxford University.
- Brown, R. T., Reynolds, C. R., & Whitaker, J. S. (1999). Bias in mental testing since “Bias in Mental Testing.” *School Psychology Quarterly, 14*(3), 208–238
- Burton, N. W., & Ramist, L. (2001). Predicting success in college: SAT studies of classes graduating since 1980. Research Report No. 2001-2. *College Entrance Examination Board*.

- Colgren, C., & Sappington, N. E. (2015). Closing the achievement gap means transformation. *Education Leadership Review of Doctoral Research*, 2(1), 24-33.
- Community College Survey of Student Engagement (n.d.).  
<https://www.ccsse.org/aboutsurvey/aboutsurvey.cfm>
- Conley, D. T. (2007). The challenge of college readiness. *Educational Leadership*, 64(7), 23–29.
- Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6), 425–453.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Crisp, G., & Delgado, C. (2014). The impact of developmental education on community college persistence and vertical transfer. *Community College Review*, 42(2), 99–117.
- Cuseo, J. B. (1997). Freshman Orientation Seminar at Community Colleges: A Research-Based Rationale for Its Value, Content, and Delivery.
- Darling-Hammond, L. (1994). Performance-based assessment and educational equity. *Harvard Educational Review*, 64(1), 5–30.
- Davidson, M. N., & Foster-Johnson, L. (2001). Mentoring in the preparation of graduate researchers of color. *Review of Educational Research*, 71(4), 549–574.
- Davis, J. E., & Jordan, W. J. (1994). The effects of school context, structure, and experiences on African American males in middle and high school. *Journal of Negro Education*, 63(4), 570–587.
- DesJardins, S. L., & Lindsay, N. K. (2008). Adding a statistical wrench to the “toolbox.” *Research in Higher Education*, 49(2), 172–179.

- Di Tommaso, K. (2016). Evaluating the effectiveness of a non-cognitive assessment instrument. *Research and Teaching in Developmental Education, 32*(2), 4–22.  
<http://www.jstor.org/stable/44290294>
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087.
- Duran, R. P. (1983). Hispanics' education and background: Predictors of college achievement. College Board Publications.
- Duyx, B., Urlings, M. J., Swaen, G. M., Bouter, L. M., & Zeegers, M. P. (2017). Scientific citations favor positive results: a systematic review and meta-analysis. *Journal of Clinical Epidemiology, 88*, 92-101.
- Ekinci, B. (2014). The relationships among Sternberg's triarchic abilities, Gardner's multiple intelligences, and academic achievement. *Social Behavior and Personality: An International Journal, 42*(4), 625-633.
- Fields, R., & Parsad, B. (2012). Tests and cut scores used for student placement in Postsecondary education: Fall 2011. *National Assessment Governing Board*.
- Finnegan, C. (2018, January 23). *Initiative update: Developmental education – A redesign to meet the promise*. Virginia Community College System.
- Flowers, A. M. (2015). The family factor: The establishment of positive academic identity for Black male engineering majors. *Western Journal of Black Studies, 39*(1), 64-74.
- Fong, C. J., Davis, C. W., Kim, Y., Kim, Y. W., Marriott, L., & Kim, S. (2017). Psychosocial factors and community college student success: a meta-analytic investigation. *Review of Educational Research, 87*(2), 388–424. 10.3102/0034654316653479



- Fong, K. E., Melguizo, T., & Prather, G. (2015). Increasing success rates in developmental math: The complementary role of individual and institutional characteristics. *Research in Higher Education, 56*(7), 719-749.
- Freedle, R. O. (2003). Correcting the SAT's ethnic and social-class bias: A method for reestimating SAT scores. *Harvard Educational Review, 73*(1), 1-43.
- Fuertes, J. N., Sedlacek, W. E., & Liu, W. M. (1994). Using the SAT and noncognitive variables to predict the grades and retention of Asian American university students. *Measurement & Evaluation in Counseling & Development, 27*, 74-84.
- Fuertes, J. N., & Sedlacek, W. E. (1995). Using noncognitive variables to predict the grades and retention of Hispanic students. *College Student Affairs Journal, 14*(2), 30-36.
- Geiser, S., & Santelices, M. V. (2007). Validity of high-school grades in predicting student success beyond the freshman year: High-school record vs. standardized tests as indicators of four-year college outcomes. Research & Occasional Paper Series: CSHE. 6.07. *Center for Studies in Higher Education*.
- Goeller, L. (2013). Developmental mathematics: Students' perceptions of the placement process. *Research & Teaching in Developmental Education, 30*(1), 22-34.
- Greene, T. G., Marti, C. N., & McClenney, K. (2008). The effort-outcome gap: Differences for African American and Hispanic community college students in student engagement and academic achievement. *Journal of Higher Education, 79*(5), 513-539.
- Harper, S. R. (2006). Reconceptualizing reactive policy responses to Black male college achievement: Implications from a national study. *GSE Publications, 169*.

- Hedlund, J., Wilt, J. M., & Nebel, K. L. (2006). Assessing practical intelligence in business school admissions: A supplement to the graduate management admissions test. *Learning & Individual Differences, 16*(2), 101–127.
- Hodara, M., & Jaggars, S. S. (2014). An examination of the impact of accelerating community college students' progression through developmental education. *Journal of Higher Education, 85*(2), 246–276.
- Hodara, M., & Xu, D. (2016). Does developmental education improve labor market outcomes? Evidence from two states. *American Educational Research Journal, 53*(3), 781–813.
- Hooker, D. (2011). Small peer-led collaborative learning groups in developmental math classes at a tribal community college. *Multicultural Perspectives, 13*(4), 220–226.
- Horn, L. J., & Carroll, C. D. (1996). *Nontraditional undergraduates: Trends in enrollment from 1986 to 1992 and persistence and attainment among 1989-90 beginning postsecondary students. Postsecondary education descriptive analysis reports. Statistical analysis report*. US Government Printing Office.
- Ivcevic, Z., & Brackett, M. (2014). Predicting school success: Comparing conscientiousness, grit, and emotion regulation ability. *Journal of Research in Personality, 52*, 29-36.
- Jaggars, S. S., Hodara, M., Cho, S.-W., & Xu, D. (2015). Three Accelerated developmental education programs: Features, student outcomes, and implications. *Community College Review, 43*(1), 3–26.
- Jenkins, P. D., & Fink, J. (2016). Tracking transfer: New measures of institutional and state effectiveness in helping community college students attain bachelor's degrees. Columbia University, Teachers College, Community College Research Center.  
<https://doi.org/10.7916/D8C24W80>

- Jenkins, D., Jaggars, S. S., & Roksa, J. (2009). Promoting gatekeeper course success among community college students needing remediation: Findings and recommendations from a Virginia study (Summary Report). *Community College Research Center, Columbia University*.
- Juszkiewicz, J. (2017). Trends in community college enrollment and completion data, 2017. American Association of Community Colleges
- Kafka, T. (2016). A list of non-cognitive assessment instruments. *Community College Research Center, Teachers College*. <https://67.205.94.182/images/a-list-of-non-cognitive-assessment-instruments.pdf>
- Kappe, R., & van der Flier, H. (2012). Predicting academic success in higher education: what's more important than being smart? *European Journal of Psychology of Education - EJPE (Springer Science & Business Media B.V.)*, 27(4), 605–619.
- King, P. M., & Bowman, N. A. (2006). [Review of the book *Beyond the big test: Noncognitive assessment in higher education*, by W.E. Sedlacek]. *Journal of Higher Education*, 77, 1104-1110.
- Komaraju, M., Ramsey, A., & Rinella, V. (2013). Cognitive and non-cognitive predictors of college readiness and performance: Role of academic discipline. *Learning & Individual Differences*, 24, 103–109.
- Krathwohl, D. R. (1998). *Methods of educational and social science research: An integrated approach*. Longman/Addison Wesley Longman.
- Lanham, B. D., Schauer, E. J., & Osho, G. S. (2011). A comprehensive analysis of the efficacy of non-cognitive measures: Predicting academic success in a historically Black university in south Texas. *Journal of College Teaching & Learning (TLC)*, 8(4), 43-52.

- Mattson, C. E. (2007). Beyond admission: Understanding pre-college variables and the success of at-risk students. *Journal of College Admission, 196*, 8–13.
- Mau, S. (1993, April). Culture wars: Conflicting expectations in a college (remedial) mathematics course. In *Annual Meeting of the American Educational Research Association, Atlanta, GA*.
- Melguizo, T., Kosiewicz, H., Prather, G., & Bos, J. (2014). How are community college students assessed and placed in developmental math? Grounding our understanding in reality. *Journal of Higher Education, 85*(5), 691–722.
- Metzner, B. S. (1989). Perceived quality of academic advising: the effect on freshman attrition. *American Educational Research Journal, 26*, 422–442.
- Micceri, T. (2009, February). How we justify and perpetuate the wealthy, white, male academic status quo through the use of biased admissions requirements. Paper presented at the Florida Association for Institutional Research Annual Conference, Cocoa Beach, FL.
- Micceri, T. (2010). *Assessing the usefulness of SAT and ACT tests in minority admissions* University of South Florida.
- Mullin, C. M., & Phillippe, K., (2013, January). Community college contributions (Policy Brief 2013-01PB). American Association of Community Colleges.
- Munt, J. A., & Merydith, S. P., (2012). The relationship of students' personality traits and psychosocial characteristics with academic retention. *Journal of College Student Retention: Research, Theory & Practice, 13*(4), 457–478.
- National Center for Education Statistics (NCES). (2018). *IPEDS fall 2017 enrollment survey* [AACC analysis]. Author.

- National Student Clearinghouse Research Center (2016). *Persistence and retention – 2015*.  
<https://nscresearchcenter.org/snapshotreport-persistenceandretention18/>
- Naumann, W. C. (1998). *Predicting first-semester grade point average using self-regulated learning variables*. The University of Nebraska-Lincoln.
- Ngo, F., & Kwon, W. (2015). Using multiple measures to make math placement decisions: Implications for access and success in community colleges. *Research in Higher Education, 56*(5), 442-470. doi:10.1007/s11162-014-9352-9
- Noonan, B. M., Sedlacek, W. E., & Veerasamy, S. (2005). Employing noncognitive variables in admitting and advising community college students, *Community College Journal of Research and Practice, 29*(6), 463-469. doi: 10.1080/10668920590934170
- O'Connor, N. (2009). Hispanic origin, socio-economic status, and community college enrollment. *Journal of Higher Education, 80*(2), 121–145.
- Olani, A. (2009). Predicting first year university students' academic success. *Electronic Journal of Research in Educational Psychology, 7*(3), 1053-1072. <http://www.investigacion-psicopedagogica.org/revista/new/english/ContadorArticulo.php?376>
- Palmer, R. T., & Strayhorn, T. L. (2008). Mastering one's own fate: Non-cognitive factors associated with the success of African American males at an HBCU. *NASAP Journal, 11*(1), 126-143.
- Pascarella, E. T., & Terenzini, P. T. (2005), *How college affects students. Volume 2: A third decade of research*. Jossey-Bass.
- Reason, R. D. (2009). An examination of persistence research through the lens of a comprehensive conceptual framework. *Journal of College Student Development, 50*(6), 659–682.

- Robbins, S., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin, 130*, 261–288. doi: 10.1037/0033-2909.130.2.261
- Rodríguez, O. (2014). Increasing access to college-level math: Early outcomes using the Virginia Placement Test. <https://doi.org/10.7916/D8HQ3X1P>
- Roksa, J., Jenkins, D., Jaggars, S. S., Zeidenberg, M., & Cho, S. W. (2009). Strategies for promoting gatekeeper course success among students needing remediation: Research report for the Virginia Community College System. *Community College Research Center, Columbia University*.
- Roscigno, V. J. (2000). Family/school inequality and African-American/Hispanic achievement. *Social Problems, 47*(2), 266.
- Roscigno, V. J., & Ainsworth-Darnell, J. W. (1999). Race, cultural capital, and educational resources: Persistent inequalities and achievement returns. *Sociology of Education, 72*(3), 158–178.
- Saxon, D. P. (2017). Developmental education: The cost literature and what we can learn from it. *Community College Journal of Research and Practice, 41*(8), 494-506.
- Scott-Clayton, J., & Columbia University, C. C. R. C. (2012). Do high-stakes placement exams predict college success? CCRC Working Paper No. 41. In *Community College Research Center, Columbia University*. Community College Research Center, Columbia University.
- Scott-Clayton, J., Crosta, P. M., Belfield, C. R., (2012). *Improving the targeting of treatment: Evidence from college remediation* (Working Paper 18457). National Bureau of Economic Research.

- Sedlacek, W. E. (2003). Alternative admissions and scholarship selection measures in higher education. *Measurement & Evaluation in Counseling & Development*, 35(4), 263.
- Sedlacek, W. E. (2004a). *Beyond the big test: Noncognitive assessment in higher education*. Jossey-Bass
- Sedlacek, W. E. (2004b). Why we should use noncognitive variables with graduate and professional students. *The Advisor: The Journal of the National Association of Advisors for the Health Professions*, 24(2), 32-39.
- Schuh, J. H. (1999). Examining the effects of scholarships on retention in a fine arts college. *Journal of College Student Retention: Research, Theory and Practice*, 1(3), 193–202. doi:10.2190/FP58-T6P4-0DP0-8RJW
- Schwartz, R. A., & Washington, C. M. (2002). Predicting academic performance and retention among African American freshmen men. *NASPA Journal*, 39(4), 354-370. doi: 10.2202/1949-6605.1178
- Sinha, R., Oswald, F., Imus, A., & Schmitt, N. (2011). Criterion-focused approach to reducing adverse impact in college admissions. *Applied Measurement in Education*, 24(2), 137–161.
- Smith, G. (2018). Step away from stepwise. *Journal of Big Data*, 5(1), 1-12. doi.org/10.1186/s40537-018-0143-6
- Sternberg, R.J. (1985). *Beyond IQ*. Cambridge University Press.
- Sternberg, Robert (1988) *The triarchic mind: A new theory of intelligence*. Viking Press.
- Sternberg, R. J. (2004). Theory-based university admissions testing for a new millennium. *Educational Psychologist*, 39(3), 185-198. doi:10.1207/s15326985ep3903\_4
- Sternberg, R. J. (2012). College admissions: Beyond conventional testing. *Change*, 9/10. 1-13.

- Sternberg, R. J., Castejón, J. L., Prieto, M. D., Hautamäki, J., & Grigorenko, E. (2001). Confirmatory factor analysis of the Sternberg triarchic abilities test (Multiple choice items) in three international samples: An empirical test of the Triarchic theory. *European Journal of Psychological Assessment, 17*(1), 1-16.
- Sternberg, R. J., & Clinkenbeard, P. R. (1995). The triarchic model applied to identifying, teaching, and assessing gifted children. *Roepers Review, 17*(4), 255-60.  
doi.org/10.1080/02783199509553677
- Strayhorn, T. L. (2008). Influences on labor market outcomes of African American college graduates: A national study. *Journal of Higher Education, 79*(1), 28–57.
- Summers, M. D. (2003). Attrition research at community colleges. *Community College Review, 30*(4), 64–84.
- Terenzini, P. T., Rendon, L. I., Upcraft, M. L., Millar, S. B., Allison, K. W., Gregg, P. L., et al. (1994). The transition to college: Diverse students, diverse stories. *Research in Higher Education, 35*, 57-73.
- Thomas, L. L., Kuncel, N. R., & Crede', M. (2007). Noncognitive variables in college admissions: The case of the non-cognitive questionnaire. *Educational and Psychological Measurement, 67*(4), 635-657. doi: 10.1177/0013164406292074
- Ting, S. M. (1998). First-year grades and academic progress of college students of first-generation and low-income families. *The Journal of College Admission, 158*, 15-23.
- Ting, S. R. (2000). Predicting Asian Americans' academic performance in the first year of college: An approach combining SAT scores and noncognitive variables. *Journal of College Student Development, 41*(4), 442-449.



- Ting, S. M. R., & Man, R. (2001). Predicting academic success of first-year engineering students from standardized test scores and psychosocial variables. *International Journal of Engineering Education, 17*(1), 75-80.
- Ting, S. M. R. (2009). Impact of noncognitive factors on first-year academic performance and persistence of NCAA Division I student athletes. *The Journal of Humanistic Counseling, Education and Development, 48*(2), 215-228. doi: 10.1002/j.2161-1939.2009.tb00079.x
- Ting, S. R., & Bryant, A., Jr. (2001). The impact of acculturation and psychosocial variables on academic performance of Native American and Caucasian college freshmen. *Journal of College Admission, 171*, 22–28.
- Ting, S. R. and Robinson, T. L. (1998). First-year academic success: A prediction combining cognitive and psychosocial variables for Caucasian and African American students. *Journal of College Student Development, 39*, 599-610.
- Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2<sup>nd</sup> edition). University of Chicago Press.
- Tobey, P. E. (1996). *Cognitive and non-cognitive factors as predictors of retention among academically at-risk college students: A structural equation modelling approach*. University of Southern California.
- Tracey, T. J., & Sedlacek, W. E. (1994). Noncognitive variables in predicting academic success by race. *Measurement and Evaluation in Guidance, 16*, 172-178.
- Tucker, L., & McKnight, O. (2019). Assessing the validity of college success indicators for the at-risk student: Toward developing a best-practice model. *Journal of College Student Retention: Research, Theory & Practice, 21*(2), 166–183.

- Waugh, G., Micceri, T., & Takalkar, P. (1994). *Using ethnicity, SAT/ACT scores, and high school GPA to predict retention and graduation rates.*
- Webb, C. T., Sedlacek, W., Cohen, D., Shields, P., Gracely, E., Hawkins, M., & Nieman, L. (1997). The impact of nonacademic variables on performance at two medical schools. *Journal of the National Medical Association, 89*(3), 173.
- White, C. J., & Shelley, C. (1996). Telling stories: Students and administrators talk about retention. *New Directions for Student Services, 74*, 15-34.
- White, T. J., & Sedlacek, W. E. (1986). Noncognitive predictors: grades and retention of specially-admitted students. *Journal of College Admission, 111*, 20–23.
- Wilds, D. J., & Wilson, R. (1998). Minorities in higher education, 1997-1998: Sixteenth annual status report.. American Council on Education.
- Windham, M.H., Rehfuss, M.C., Williams, C. R., Pugh, J.V., & Tincher-Ladner, L. (2014). Retention of first-year community college students. *Community College Journal of Research & Practice, 38*(5), 466-477. doi:10.1080/10668926.2012.743867
- Xu, D., & Dadgar, M. (2018). How effective Are community college remedial math courses for students with the lowest math dskills? *Community College Review, 46*(1), 62–81.

## APPENDIX A

### **Noncognitive Factors for Diagnosis in Advising Nontraditional Students (Sedlacek, 2004)**

- I. Positive self-concept or confidence. Strong self-feeling, strength of character. Determination, Independence
- II. Realistic self-appraisal, especially academic. Recognizes and accepts any deficiencies and works hard at self-development. Recognizes need to broaden his/her individuality.
- III. Understands and deals with racism. Realist based upon personal experience of racism. Is committed to fighting to improve existing system. Not submissive to existing wrongs, nor hostile to society, nor a "cop-out." Able to handle racist system. Asserts school or organization role to fight racism.
- IV. Prefers long-range goals to short-term or immediate needs. Able to respond to deferred gratification.
- V. Availability of strong support person to whom to turn in crises.
- VI. Successful leadership experience in any area pertinent to his/her background (gang leader, church, sports, noneducational groups, etc.)
- VII. Demonstrated community service. Has involvement in his/her cultural community.
- VIII. Knowledge acquired in a field. Unusual and/or culturally related ways of obtaining information and demonstrating knowledge. Field itself may be nontraditional.

## APPENDIX B

### ODU Institutional Review Board Informed Consent Form

Dear Participant:

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. You are being asked to participate in a research project. Researchers are required to provide a consent form to inform you about the study, to convey that participation is voluntary, to explain risks and benefits of participation, and to empower you to make an informed decision. You should feel free to ask the researchers any questions you may have.

**Study Title:** Combining Multiple Measures with Non-Cognitive Assessments to Increase Placement Accuracy and Predict First Year Success

**Primary Investigator:** Chris R. Glass, Ph.D., Assistant Professor, College of Education, Department of Educational Foundations and Leadership, Old Dominion University

**Investigator:** David Lerman, M. Ed., Doctoral Student, Community College Leadership Program, College of Education, Department of Educational Foundations and Leadership, Old Dominion University

#### 1. PURPOSE OF RESEARCH:

As a student, you are being asked to participate in a research study exploring non-cognitive traits. Your participation will contribute to the knowledge surrounding college student assessment, placement, and retention. This study, entitled Combining Multiple Measures with Non-Cognitive Assessments to Increase Placement Accuracy and Predict First Year Success, is conducted by the investigators listed above.

#### 2. WHAT YOU WILL DO:

You will take a survey that takes about 20 minutes to complete. You may choose not to respond to any item if you are concerned that responding would reveal personally identifiable information.

#### 3. RISKS AND BENEFITS:

No risks are anticipated. The potential benefits of the study include increased knowledge about your feelings regarding what are commonly referred to as non-cognitive factors (i.e., community, self-concept, leadership, availability of a support person, etc.) by completing the survey and contributing to the improvement of students and the college community.

#### 4. PRIVACY AND CONFIDENTIALITY:

Your confidentiality will be protected to the maximum extent allowable by law. Any direct identification information, including your name, will be removed from data when responses are analyzed. All data will be secured in password-protected, secure servers. The data will be accessible only to the researchers associated with this study and the Institutional Review Board. During analysis, numeric codes will be assigned to your information so that your name is not associated with the data files. During dissemination, findings will be reported by theme (aggregating the data). The results of this study may be published or presented at professional meetings, but the identities of all research participants will remain confidential. All data will be stored for at least five years after the project closes. Five years after the conclusion of the study, the data will be destroyed.

### **5. YOUR RIGHTS TO PARTICIPATE, SAY NO, OR WITHDRAW:**

Your participation is completely voluntary. By clicking on the survey link, you will indicate your voluntary participation in this study. It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study at any time. You may choose not to participate at all, or to answer some questions and not others. You may also change your mind at any time and withdraw as a participant from this study with no negative consequences.

### **6. COSTS AND COMPENSATION FOR BEING IN THE STUDY:**

At the end of the completed survey your contact information will be entered into a prize drawing. The information entered will not be linked to your survey responses, beyond that the survey must be complete. At the conclusion of the survey period, a drawing for a \$100 Visa card will take place. The student winner will be notified through her/his student email account.

### **7. CONTACT INFORMATION FOR QUESTIONS AND CONCERNS:**

- If you have any questions later on, then the researchers should be able to answer them; please contact the researchers Dr. Chris R. Glass, 2309 Education Building, Old Dominion University, Norfolk, VA, [crglass@odu.edu](mailto:crglass@odu.edu), 757-683-4118. If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, Dr. Laura Chezan, the current chair for the Darden College Human Subjects Review Committee, at 757-683-7055 or [lchezan@odu.edu](mailto:lchezan@odu.edu) at Old Dominion University.
- If you say YES, then your consent in this document does not waive any of your legal rights. However, in the event of harm arising from this study, neither Old Dominion University nor the researchers are able to give you any money, insurance coverage, free medical care, or any other compensation for such injury. In the event that you suffer injury as a result of participation in any research project, you may contact the responsible principal investigator at Dr. Chris R. Glass, 2309 Education Building, Old Dominion University, Norfolk, VA, [crglass@odu.edu](mailto:crglass@odu.edu), 757-683-4118, or Dr. Laura Chezan, the current chair for the Education Human Subjects Review Committee, at 757-683-7055 or [lchezan@odu.edu](mailto:lchezan@odu.edu) at Old Dominion University.

## APPENDIX C

### PVCC Informed Consent Form

Dear Piedmont Virginia Community College Student,

The Student Services Division is conducting a research study to further understand factors that contribute to student placement and progress at Piedmont Virginia Community College.

We are requesting your participation in the completion of a questionnaire, which will take approximately twenty minutes. Your participation in this study is voluntary. You may choose not to participate or to withdraw from the study at any time; there will be no penalty.

Your responses to this survey will be kept confidential and any identifiable information will be limited to the researchers and discarded once coded. The results of the research study may be published, but your name will not be used.

The potential benefits of the study include increased knowledge about your feelings regarding what are commonly referred to as non-cognitive factors (i.e., community, self-concept, leadership, availability of a support person, etc.) by completing the survey and contributing to the improvement of students and the college community.

At the end of the completed survey your contact information will be entered into a prize drawing. The information entered will not be linked to your survey responses, beyond that the survey must be complete. At the conclusion of the survey period, a drawing for a \$100 Visa card will take place. The student winner will be notified through her/his student email account.

This research has been approved by the College's Institutional Review Board. Your completion of the questionnaire will be considered your consent to participate. If you have any questions concerning the research study, please contact the Office of Institutional Research, Planning and Institutional Effectiveness at 434-961-5301 or [jhamm@pvcc.edu](mailto:jhamm@pvcc.edu).

Thank you for participating in the following survey.

## Appendix D

### Supplementary Success Questionnaire (Modified NCQ)

Piedmont Virginia Community College is using this questionnaire to gather information for the purpose of improving future student success. Please be completely open and honest. We appreciate your help! Your email address will be recorded when you submit this form.

1. What is your age? \*
2. What is your gender? \*
3. What is your race? \*
4. How much education do you expect to get during your lifetime?
5. If you earn a college degree will you be the first person in your immediate family to do so? \*
6. What grade do you expect to earn in your Student Orientation (SDV) course?
7. Approximately how many hours per week do you plan to work this semester?
8. Please list three goals that you have for yourself right now. \*
9. More than 50 percent of community college students typically leave before receiving a degree. If this should happen to you, what would be the most likely cause?
10. Please list three things that you are proud of having done: \*
11. The College should use its influence to improve societal conditions in the state.
12. It should not be very hard to get a B (3.0) average at PVCC
13. I get easily discouraged when I try do something and it doesn't work \*
14. I am sometimes looked up to by others. \*
15. If I run into problems concerning school, I have someone who would listen to me and help me. \*

16. There is no use in doing things for people, you only find that you get it in the neck in the long run. \*
17. In groups where I am comfortable, I am often looked to as leader. \*
18. I expect to have a harder time than most students at PVCC. \*
19. Once I start something, I finish it. \*
20. When I believe strongly in something, I act on it. \*
21. I am as skilled academically as the average applicant to PVCC. \*
22. I expect that I will encounter racism at PVCC. \*
23. People can pretty easily change me even though I thought my mind was already made up on the subject. \*
24. My friends and relatives don't feel I should go to college. \*
25. My family has always wanted me to go to college. \*
26. If course tutoring is available on campus at no extra cost, I will attend regularly. \*
27. I want a chance to prove myself academically. \*
28. My high school grades don't really reflect what I can do. \*
29. Please list offices held and/or groups belonged to in high school or in your community. \*



## APPENDIX E

### NCQ Scoring Key

#### SCORING KEY FOR SUPPLEMENTARY ADMISSIONS QUESTIONNAIRE II (slightly modified)

William E. Sedlacek

Questionnaire items	Variable Name (Number)
6	Use to score for Self-Concept (1) Option 1 = 1; 2 = 2; 3 = 3; 4 = 4; No response = 2
7	A. Options for Long Range Goals (IV) Each goal is coded according to this scheme: 1 = a vague and/or immediate, short-term goal (e.g., “to meet people,” “to get a good schedule,” “to gain self confidence”) 2 – a specific goal with a stated future orientation which could be accomplished during undergraduate study (e.g., “to join a sorority so that I can meet more people,” “to get a good schedule so that I can get good grades in the fall,” “to run for a student government office”) 3 = a specific goal with a stated future orientation which would occur after community college (e.g., “to get a good schedule so I can get the classes I need for graduate school,” “to become a president of a Fortune 500 Company”) B. Options for Knowledge Acquired in a Field (VIII) Each goal is coded according to this scheme: 1 = not at all academically or school related; vague or unclear (e.g., “to get married,” “to do better,” “to become a better person”) 2 = school related, but not necessarily or primarily educationally oriented (e.g., “to join a social club,” “to become student body president”) 3 = directly related to education (e.g., “to get a 3.5 GPA,” “to get to know my teachers”) Find the mean for each dimension (e.g., Long Range Goals) and round to the nearest whole number.
Questionnaire items	Variable Name (Number)
8	Use to score for Self-Concept (I) and Self Appraisal (II) Option 1 = 4; 2 through 9 = 2; No response = 2
9	Use to score for Self-Concept (I) Each accomplishment is coded according to this scheme:

1 = at least 75% of students starting at your school could accomplished it (e.g., “graduated from high school,” “held a part-time summer job”)

2 = at least 50% of students starting at your school could have accomplished it (e.g., “played on an intramural sports team,” “was a member of a school club”)

3 = only 25% of students starting at your school could have accomplished it (e.g., “won an academic award,” “was captain of football team”)

Find the mean code for this dimension and round to the nearest whole number.

For items 10 through 28, positive (+) items are scored as is. Negative (-) items are reversed, so that 1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1. A shortcut is to subtract all negative item responses from 6.

Questionnaire items	Direction	Variable Name (Number)
10	-	Use to score for Racism (III)
11	-	Use to score for Realistic Self-Appraisal (III)
12	+	Use to score for Long-Range Goals (IV)
13	-	Use to score for Leadership (VI)
14	-	Use to score for Availability of Strong Support (V)
15	+	Use to score for Community Service (VII)
16	-	Use to score for Leadership (VI)
17	+	Use to score for Racism (III)
18	-	Use to score for Long-Range Goals (IV)
19	-	Use to score for Positive Self-Concept (I)
20	-	Use to score for Realistic Self-Appraisal (II)
21	-	Use to score for Racism (III)
22	-	Use to score for Positive Self-Concept (I)
23	-	Use to score for Availability of Strong Support (V)
24	-	Use to score for Availability of Strong Support (V)
25	-	Use to score for Racism (III)
26	-	Use to score for Positive Self-Concept (I)
28		Use to score for Leadership (VI), Community Service (VII), and Knowledge Acquired in a Field (VIII). Each organization is given a code for A,B, and C below. Find the mean for each dimension (e.g., Leadership) and round to the nearest whole number.

A. Leadership (VI)

1 = ambiguous group or no clear reference to activity performed (e.g., “helped in school”)

2 = indicates membership but has not formal or implied leadership role; it has to be clear that it’s a functioning group and, unless the criteria are met for the score of “3” as described below, all groups should be coded as “2” even if you, as the rater, are not familiar with the group (e.g., “Fashionettes,” “was part of a group that worked on community service projects through my church”)

3 = leadership was required to fulfill role in group (e.g., officer or implied initiator, organizer, or founder) or entrance into the group was dependent upon prior leadership (e.g., “organized a tutoring group for underprivileged children in my community,” “student council”)

B. Community Service Relatedness (VII)

1 = no community service performed by group, or vague or unclear in relation to community service (e.g., “basketball team”)

2 = some community service involved but it is not the primary purpose of the group (e.g., “Scouts”)

3 = group’s main purpose is community service (e.g., “Big Brothers/Big Sisters”)

C. Knowledge Acquired in a Field (VIII) (same coding criteria as used for item 8B.

**APPENDIX F**  
**Correlation Matrix**

	Constant	Positive Self-Concept	Realistic Self-Appraisal	Understands and Deals with Racism Items	Prefers Long-Range Goals	Availability of SSPI	Successful Leadership Experience
Constant	1.00	-0.35	-0.34	-0.44	0.04	-0.52	-0.44
Positive Self-Concept	-0.35	1.00	-0.28	0.18	-0.17	-0.08	0.11
Realistic Self-Appraisal	-0.34	-0.28	1.00	-0.05	-0.05	0.35	-0.16
Understands and Deals with Racism Items	-0.44	0.18	-0.05	1.00	-0.49	-0.07	0.34
Prefers Long-Range Goals	-0.52	-0.08	0.35	-0.07	1.00	1.00	0.04
Availability of SSPI	-0.52	-0.08	0.35	-0.07	0.01	1.00	0.04
Successful Leadership Experience	-0.44	0.11	-0.16	0.34	0.01	0.04	1.00
Demonstrated Community Service	0.06	-0.03	0.15	-0.21	-0.14	-0.05	-0.43
Knowledge in Field	-0.42	0.16	-0.10	0.21	-0.01	0.14	0.09
Age	-0.15	-0.12	0.06	0.07	-0.04	-0.01	-0.12
First Gen N	0.08	-0.06	-0.14	-0.01	0.05	-0.15	0.09
Work Hours N	-0.29	0.14	0.00	0.23	-0.16	0.17	0.14
VPT	-0.25	0.33	-0.01	0.20	-0.19	-0.01	0.03
MM	0.04	0.12	-0.15	-0.04	0.02	-0.14	0.01
Gender = Female	-0.32	0.01	0.07	0.08	0.01	0.37	-0.07

	Demonstrated Community Service	Knowledge in Field	Age	First Gen N	Work Hours N	VPT	MM	Gender = Female
Constant	0.06	-0.42	-0.15	0.08	-0.29	-0.25	0.04	-0.32
Positive Self- Concept	-0.03	0.16	-0.12	-0.06	0.14	0.33	0.12	0.01
Realistic Self- Appraisal	0.15	-0.10	0.06	-0.14	0.00	-0.01	-0.15	-0.07
Understands and Deals with Racism Items	-0.21	0.21	0.07	-0.01	0.23	0.20	-0.04	0.07
Prefers Long- Range Goals	-0.14	-0.01	-0.04	0.05	-0.16	-0.19	0.02	0.08
Availability of SSPI	-0.05	0.14	-0.01	-0.15	0.17	-0.01	-0.14	0.01
Successful Leadership Experience	-0.43	0.09	-0.12	0.09	0.14	0.03	0.01	0.37
Demonstrated Community Service	1.00	-0.20	0.11	0.02	-0.08	-0.03	-0.08	-0.21
Knowledge in Field	-0.20	1.00	-0.03	-0.06	0.04	0.08	0.00	0.20
Age	0.11	-0.03	1.00	-0.01	-0.22	0.07	0.08	0.12
First Gen N	0.02	-0.06	-0.01	1.00	-0.21	-0.04	-0.08	0.05
Work Hours N	-0.08	0.04	-0.22	-0.21	1.00	0.03	-0.03	0.09
VPT	-0.03	0.08	0.07	-0.04	0.03	1.00	0.30	0.01
MM	-0.08	0.00	0.08	-0.08	-0.03	0.30	1.00	0.05
Gender = Female	-0.21	0.20	0.12	0.05	0.09	0.01	0.05	1.00

## VITA

**DAVID H. LERMAN**

978 Thorn Rose Lane, Charlottesville, VA | 434 293-5899 | d\_lerman@yahoo.com

### EXPERIENCE

---

<b>Piedmont Virginia Community College (PVCC), Charlottesville, VA</b>	2001-Present
Student Services Division	
<b>Director, Student Success and Retention</b>	2017-Present
<b>Coordinator, Student Success</b>	2015-2017
<b>Student Success Advisor, Counseling and Career Services</b>	2005-2015
<b>Program Manager, WIA Adult Program &amp; Education for Independence Program</b>	2001-2005
<b>CASA (Court Appointed Special Advocates), New Orleans, LA</b>	1999-2000
<b>Project Coordinator, New Orleans Child Advocacy Center</b>	

### EDUCATION

Old Dominion University (ODU), Norfolk, VA	2022
<b>Community College Leadership, Ph.D.</b>	
<b>Dissertation:</b> Combining Cognitive and Noncognitive Assessments to Predict First Year GPA and Persistence in Community College Students.	
Virginia Commonwealth University, Richmond, VA	2012
<b>M.Ed., Counselor Education</b>	
University of San Diego, San Diego, CA	1993
<b>B.A., Psychology</b>	

### PROFESSIONAL AFFILIATIONS & AWARDS

<b>Leadership Award, ODU CCL program</b>	2020, 2022
<b>Distinguished Service Award, PVCC</b>	2016
<b>Fellowship, ODU Community College Leadership Ph.D. program</b>	2018
<b>Selected Participant, VCCS International Exchange Program. Netherlands</b>	2013-2014
<b>Staff Showcase Award, Virginia Community College Association</b>	2004, 2013
<b>Chancellor's Fellowship, Virginia Community College System</b>	2012
<b>Community Service Award, PVCC Board (inaugural award)</b>	2006
<b>Chair, PVCC College Senate (inaugural chair)</b>	2002-2004
<b>President/Vice-President, PVCC Professional Association of Support Staff</b>	
2002-04, 2016	