

AC 2007-1648: THE PACT: A FRAMEWORK FOR RETAINING 1ST YEAR AFRICAN-AMERICAN ENGINEERING MEN

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The Pact: A framework for retaining 1st year African American Engineering Men

In 2001, the National Science Foundation (NSF) reported that 8.1% of the total science and engineering degrees offered at the baccalaureate level were awarded to African-Americans. In 2004, Caucasian men composed of 69.3% of the science and engineering degrees whereas African-American men accounted for 5.9%.¹ African-American men are still disproportionately represented in the engineering and science fields. In order to address this need, Virginia Tech's College of Engineering has developed The VT PACT, a retention program for first-year African-American men in engineering. The purpose of this paper is two-fold: 1) to discuss how the book titled, *The Pact*, written by Drs. Sampson Davis, George Jenkins, and Rameck Hunt was used as a framework to develop the The VT PACT and 2) to discuss the impact of The VT PACT for the 2005-2006 academic year and the 2006 fall semester.² The researchers provide brief background on statistics for African-American men pursuing degrees in engineering, an overview of retention programs geared toward African-American men and an overview of the book, *The Pact*. Following the overview of *The Pact*, this paper explains the process used to align *The Pact* as a framework to set a pact among first-year African-American men in engineering. Then the paper concludes with how The VT PACT impacted the first-year African American males in engineering for the 2005-2006 academic year and the 2006 fall semester and recommendations for future VT PACT cohorts.

Statistics in Engineering

In 2005, the U.S. Department of Education reported the number of bachelor degrees conferred by degree granting institutions, by racial and ethnic group and sex (Table 1). Table 1 displays an increase of degrees awarded to African American men, but in smaller proportion when compared to Caucasian men and African-American women. The number of degrees awarded to African American women is almost double the number of degrees awarded to African American men. For the 2004-2005 academic year, Grose reported that 66.2% of bachelor's degrees were awarded to Caucasians, where as only 5.3% of bachelor's degrees were received by African Americans.³ Among this 5.3%, African American women received 2,427 of those degrees and African American men obtained 1,149.

| Numbers of Degrees Conferred | | | |
|-------------------------------------|--------------|--------------------------------|---------------------------------------|
| <i>Year and Gender</i> | <i>Total</i> | <i>Caucasian, non-Hispanic</i> | <i>African-American, non-Hispanic</i> |
| Total | | | |
| 2000-01 | 1,244,171 | 927,357 | 111,307 |
| 2001-02 | 1,291,900 | 958,597 | 116,623 |
| 2002-03 | 1,348,503 | 994,234 | 124,241 |
| 2003-04 | 1,399,542 | 1,026,114 | 131,241 |
| | | | |
| Males | | | |
| 2000-01 | 531,840 | 401,780 | 38,103 |
| 2001-02 | 549,816 | 414,892 | 39,196 |
| 2002-03 | 573,079 | 430,024 | 41,472 |
| 2003-04 | 595,425 | 445,483 | 43,851 |
| | | | |
| Females | | | |
| 2000-01 | 712,331 | 525,577 | 73,204 |
| 2001-02 | 742,084 | 543,705 | 77,427 |
| 2002-03 | 775,424 | 564,210 | 82,769 |
| 2003-04 | 804,117 | 580,631 | 87,390 |

Data from U.S. Department of Education⁴

Table 1. Bachelor's degrees conferred by degree-granting institutions by racial/ethnic group and gender of students for years 2000-01 through 2003-04.

Overview of Retention Programs for African American Men

An internet search was conducted to see if there were any retention programs geared towards African American males in engineering. The search provided very limited information on programs specifically targeted towards African American men in engineering. Therefore, an overview of retention programs for African American males in college was obtained from the book, *African American Men in College*.⁵ Five retention programs are discussed below.

SAAB

Student African American Brotherhood (SAAB) was created by Dr. Tyrone Bledsoe to address the academic challenges faced by African Americans at Georgia Southwestern State University. The primary purpose of SAAB is for all Black male members to be role models for each other as well as for other Black males in their community. Another goal for the program is for all Black males at participating institutions to take full advantage of their academic years and to better understand and practice their full responsibilities, rights, and privileges as citizens of this country. SAAB provides an opportunity for its

members to work in the community with other younger Black males in need of guidance and direction. To accomplish its goals, educational and cultural activities are offered to all student participants. Services such as tutorial assistance, career planning and counseling, cultural and social activities, personal development opportunities, community service and service learning, and spiritual enrichment opportunities are offered. The basic structure of the organization consists of six committees addressing the following areas: (1) personal development, (2) service, (3) academic, (4) financial affairs, (5) spiritual-enrichment/ social, and (6) membership/public relations.

The Black Man On Campus Project

The Black Man On Campus (BMOC) Project was initiated during the fall 2000 at Bowling Green State University (BGSU). The program was intended to provide a foundation for the academic and social success of African American males at BGSU through mentoring relationships, a classroom environment that embraced their African American cultural legacy, and activities designed to promote a positive self-image. The proposed impact of the BMOC Project on student success was defined by the four elements of the Project:

1. Transition - facilitate a smoother transition from high school to college by lining students with a faculty or staff mentor.
2. Involvement - promote involvement in campus life as a way to enhance socialization, stimulate leadership development, and promote a positive self-image.
3. Persistence - expect a greater first –to-second-semester and first-to-second-year persistence rate for students who participate in this Project compared with students who do not participate.
4. Success - ensure a smooth transition and greater on-campus involvement for students, to increase the likelihood they will persist to graduation and be successful at BGSU and beyond.

Black Men's Collective

The Black Men's Collective (BMC) was created in 1992 to address the low retention rate of African American males at Rutgers University. The BMC was formed for the expressed purpose of increasing the interaction and dialogue among African American males around academic and life issues ranging from retention to economic empowerment. The BMC is structured in this way to allow for full, equal participation and ample leadership opportunities for all members. As far as events, the BMC sponsors an annual Cultural and Academic Bonding workshop for first-year African American male students. The program serves as an orientation to the university as well as a forum for addressing some of the challenges facing first-year African American males at the university. The BMC also sponsors several other programs each year, including general membership meeting, discussions on academic and career success, a Black Men's Retreat, and a Kwanzaa celebration, to name just a few. Cross-generational mentoring and role modeling occurs in the BMC informally and through the connections made between participants. A formal peer mentoring program was recently developed to foster an

intentional link between continuing African American male students and first-year students. Overall, the BCM is perceived by the Rutgers administration as having provided a successful initial attempt to help develop and retain African American males.

Black Male Rap Session

African Americans have a rich oral tradition, and rap is a significant part of that tradition. Rap, therefore, can be used as a discussion format to exchange dialog and ideas. Thus, the informal, biweekly support group for African American male students at the University of Louisville, known as the Black Male Rap Session (B-MRS), was created. B-MRS is an attempt to engage the positive influences of the college environment as they relate to student development, with group techniques to enhance the potential for black males to feel more comfortable in the traditionally White college and university setting. B-MRS has six primary objectives.

1. To provide a positive and supportive environment for the discussion (rap session) of a variety of topics, issues, and concerns relevant to Black males.
2. To facilitate the rap sessions. The group leader is responsible for keeping the discussion moving so as to involve all participants.
3. To encourage Black faculty members to participate in B-MRS; for example, they can present examples of their research or lead a group discussion.
4. To facilitate the transition of Black Male Students to the college environment. For many Black males adjusting to the new academic expectations in the postsecondary environment proves to be very difficult.
5. To provide a snack or a meal, simply because many minority males are often underprivileged financially.
6. To develop an evaluation mechanism to determine the success or failure of the rap sessions and use that evaluation mechanism as a tool to improve the program.

African American Men of Arizona State University

African American Men of Arizona State University (AAMASU) is one of several retention initiatives coordinated through Arizona State University's (ASU) Multicultural Student Center. The college student organization is a formally recognized student group of ASU African American students designed to support the retention, leadership training, and cultural development of its participants. The goal of this program is to provide holistic programming at the university level to enhance the critical analysis, independent study, and programming skills of ASU African American male participants in the AAMASU student organization.

Many of the components discussed in these retention programs have been implemented in The VT Pact. Next is an overview of the book, *The Pact*, and The VT PACT.

Overview of *The PACT*

In this section of the paper, the researchers had a student that participated in The 2005 VT PACT to write a brief overview of the book, *The Pact*. The student explained how the journeys of Drs. Sampson Davis, George Jenkins, and Rameck Hung led to a pact in order to fulfill their dreams to becoming medical doctors.

The Pact is a great, inspirational book that captures, in many ways, the obstacles that young African Americans face as they struggle to elude the inevitable ghetto and poverty life. In the book, three young men from the same school district with great aspirations of becoming doctors made a pact to hold each other accountable for their success. One's failure meant everyone failed and this was the mentality that kept them going. They each excelled in high school and received college acceptance letters to the same school. With their completely different personalities, but similar unstable and troubling family backgrounds, the three young students never gave up.

In many ways the book signifies more than just a pact, it signifies the nearly perpetual determination of African American students who seek to excel. During their college life, there were many circumstances that really forced them to contemplate quitting school. Fortunately, they were all serious about the pact that they made with each other, so they never allowed each other to deviate from their path. All three of the students had other great talents that seemed to be less challenging and more auspicious, but they all realized that rapping, sports, or entertainment were all whimsical careers in which you struck big by chance. One of the three tried his luck at a rapping career and it seemed to have taken off well, but in no time his fellow pact friends reminded him of his goals. They slipped into their old street ways sometimes, but they always evaluated their actions and took corrective measures to prevent themselves from doing such things again.

Some of the students had many family emergencies that just seemed to drag them down, but the others fought back and prevented each other from going back to their dangerous homes. After their long arduous undergraduate education, each of the students sought to get some place for their residencies. As usual, the process was not easy: one of the students was rejected several times. His was a serious case of hopelessness, as he received rejections upon rejections. Just when he felt like giving up, he tried one last time and he obtained a residency. In his own words, Sampson (Sam) makes a statement that best summarizes the perseverance among the pact members. One might ask, what is the point of trying? And Sam is likely to respond, "When you've failed repeatedly and think you're done, that last try-the one that requires every ounce of will strength you have-is often the ounce to pull you through....There is nothing sweeter than stealing victory from the jaws of defeat." This is the same teaching, but rather it was derived from his life experience.

History of The VT PACT

In 2005, the Director of the Student Transition Engineering Program (STEP) at Virginia Tech met with all the African American males that participated in STEP. STEP is a summer bridge program for incoming freshmen in engineering. During the first week of STEP the director introduced the book, *The Pact*, to the students. The students were eager to read the book so the director provided the students the book to read and met with the students weekly to discuss the book. Examples of questions discussed during their weekly meetings include:

1. “Rameck’s grandmother tries to teach him a tough lesson when she takes back the money she’s lent him for portfolio pictures because he found out this his mother used it to pay the utility bill. ‘You can’t help nobody till you help yourself,’ she tells him. Do you agree with her philosophy? What do you think Rameck took away from that experience?”
2. “Education is at the center of this success story. But teachers like Ms. Johnson, who nurtured and inspired George, were less prevalent than those who ‘...just didn’t know how to reach us and didn’t seem to care. They expected and accepted mediocrity or less, and unfortunately, we usually gave no more.’ Why do you think George felt this way? To what degree are teachers—and students—to blame for this situation? Does the book suggest any ways to improve the system?”
3. “If the program that gave these young men a chance at college—and the hundreds of other programs like it—didn’t exist, do you think they would have succeeded anyway? Why or why not?” (<http://www.penguinputnam.com/static/rguides/us/pact.html>)

After several discussions on the book, the students and the director begin to apply lessons learned from the book to the students’ transition from high school to the College of Engineering at Virginia Tech. The students were asked to contemplate this idea before returning back to Virginia Tech for their fall semester. In the fall, the students and the director met four times during the semester. The meetings did not last longer than an hour. During the first meeting, the students and the director discussed how to use the book to motivate the students to complete their degrees in engineering. Also, the students were asked to set a pact. The students set a pact to obtain a 3.4 grade point average (GPA), in which, the group accomplished by obtaining a group GPA of a 3.61 during their first semester. In addition to setting a goal to accomplish a specific GPA, the group also set other goals:

1. To set goals for the 4 years at Virginia Tech in the College of Engineering and hold each other accountable on reaching each goal
 - a. To maintain a 3.3 overall GPA
 - b. Utilize resources on campus
2. To meet regularly and motivate each other to do well by encouraging each other to perform well academically, socially, and professionally
 - a. To make each other comfortable with one another due to the shortage of black men on campus

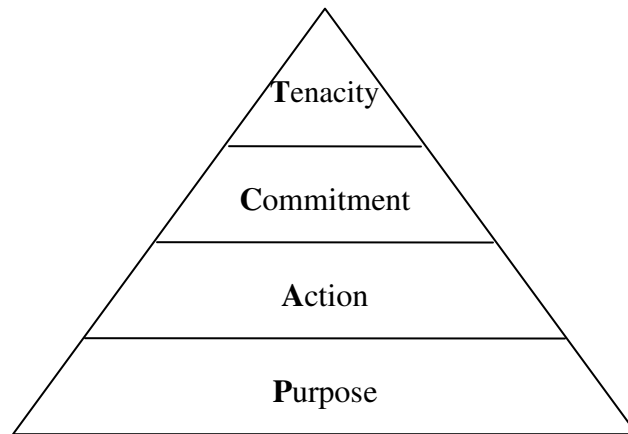
After setting goals, The VT PACT students were responsible for meeting monthly with the director of STEP. These meetings were conducted to update the director and the VT PACT

members about the students' first semester experience at Virginia Tech. In addition, these meetings were used to discuss their pact and sharing information about their professional, personal, and academic life.

The VT PACT Framework

During the second year of The VT PACT, a framework was developed to implement The VT PACT as a program to retain first-year African American males in engineering. This framework was centered on the acronym PACT.

P = Purpose
A = Action
C = Commitment
T = Tenacity



One construct of this model is tenacity. Tenacity means persistent determination. The students have the ultimate drive to accomplish these goals. For example, when discussing tenacity with the group, the students discussed their feelings about not failing and reaching their desired goal of graduating with their engineering degree. When asked to explain tenacity, one student referred to the story of the “The Little Engine That Could.” He indicated that when you feel like giving up you must keep pressing on to the end. Regardless of the outcome, you still can determine to move forward with your goals.

A second construct of this model is commitment. Webster Dictionary defines commitment as the state of being bound emotionally or intellectually to a course of action or to another person or persons.⁶ In this group, the young men had to make a pact as a group and as an individual to achieve a 3.4 GPA. They decided on how this pact was going to be achieved both as individuals and as a group. For example, the students had to submit individual goals to the director on how they were going to accomplish this task. As a group, they came up with more approaches to achieve these goals as a group.

A third construct of this framework is action. According to the Webster Dictionary action is an act that one consciously wills and that may be characterized by physical or mental activity.⁶ The students in the program decided in setting their goals and how much time and energy they were going to put into their goals. For example, they knew in high school they studied five to 10 hours for all their class. However, they discovered through the students that participated in the Student Transition Engineering Program (STEP) that the time spent studying and working on projects were going to highly increase. Another example of the young men working to put

action in obtaining their personal and group goals was that they were going to sit in the front of the class and stay awake in all the classes.

A final construct to this model is purpose. Purpose means desired goal or intention. This construct is a critical element to The VT PACT because it will set the tone for the entire group. Each individual in the group had to define their purpose on why they were at the university and how they were going to reach their individual goals. The function of the group is to help facilitate a discussion on the students' individual goals and spark a conversation on how to set objectives and obtaining their goals. For example, many of the students indicated they wanted to receive a 3.0 GPA. Then they discussed how they would achieve their expected GPA. Some of the different ways in which they could reach this goal was studying 3-5 hours per class, study groups, ask professors for assistance when the subject matter does not connect and several other ways.

The Impact of The VT PACT

A qualitative and quantitative study was conducted to evaluate the impact of The VT Pact. Structured interviews were conducted to understand the impact of The VT PACT on the 2005 cohort. For the 2006 cohort, a posttest-only design with a non-equivalent group was used to compare first-year African-American men who participated in the 2006 cohort and those who did not. Below both studies will be discussed.

The 2005 VT Pact

In the fall of 2005, 21 African American men enrolled in Virginia Tech's College of Engineering. Six of the 21 first-year men participated in The 2006 VT Pact.

Participants

Five of the six (83%) African-American males who participated in The 2005 VT Pact during their first-year of engineering participated in the interviews. Each participant was asked 6 questions:

1. Why did you join The VT PACT?
2. How would you describe your 1st year of VT?
3. How did the book, *The PACT*, impact your VT experience?
4. Describe some of your best experiences from The VT PACT.
5. Describe some of your challenging experiences from The VT PACT.
6. What would you change about your VT PACT experience?

Summary of interview responses

All of The VT PACT participants decided to participate in The VT PACT because they were interested in a support system to help them during their first year in engineering. The participants indicated that they joined The VT PACT to develop a tight knit community with other African American men pursuing engineering degrees, to have someone to keep them accountable, and to help other African American men excel.

Three of The VT PACT participants stated that their first year at Virginia Tech was very difficult, where as two of the participants stated that their first year was average because of the summer engineering bridge program they participated in during the summer prior to their first semester at Virginia Tech. In addition, all of the participants shared similar experiences about their social life. All of the students were active in at least one student organization and participated in The VT PACT social events.

The book, *The Pact*, had a positive experience on all of The VT PACT participants. Two of the participants stated that the book provided them a greater appreciation for their education. Two participants indicated that the book provided them a sense of motivation. One student was motivated to succeed and help other students succeed and the other student was motivated because he felt as if he was not alone because the book demonstrated men similar to him that were faced with many obstacles and overcame the odds to accomplish their goals.

All of The VT PACT students indicated that their best experience from The VT PACT was a combination of the academic and social activities. They enjoyed socializing with each other outside of class, helping each other with class assignments, and attending the social events together. They also stated some challenges from being in The VT PACT. These challenges included holding VT Pact members accountable for reaching their VT PACT grade point average goal, motivating members who put in minimum effort to succeed during their first-year of engineering, and helping fellow students who were having difficulty in many of their classes.

The VT PACT participants were also asked about what they would change about their first-year experience. Four of the five stated they would not change anything, and one student indicated he would have spent more time socializing with his friends.

The 2006 VT PACT

In the fall of 2006, 23 African American men enrolled in Virginia Tech's College of Engineering. Eleven of the 23 (48%) first-year men participated in The 2006 VT Pact. A posttest-only design with a non-equivalent group was conducted to compare first-year African-American males who did not participate in The VT PACT (control group) and those who participated in The 2006 VT Pact (experimental group). The participants were compared on constructs from the Student Adjustment to College Questionnaire (SACQ): academic adjustment, social adjustment, personal-emotional adjustment, and attachment.

Participants

Twenty-three (100%) first-year African-American males enrolled in Virginia Tech's College of Engineering completed the online SACQ. The mean age for the participants was 18.39 ($SD = 0.72$). These participants were divided into two groups, non-VT PACT (control group) and VT PACT (experimental group). The non-VT PACT group included 12 first-year African-American men who did not participate in The VT PACT, and The VT PACT group included 11 first-year African-American men who were participants in The VT PACT.

Questionnaire

The SACQ was administered for this study. The purpose of the SACQ was to assess how well a student is adapting to the demands of the college experience.⁷ The questionnaire was comprised of 67 questions distributed among four subscales: academic adjustment (20), social adjustment (20), personal-emotional adjustment (15), and attachment (15). Each question was a Likert-type question with a scale ranging from 1 (applies very closely to me) to 9 (doesn't apply to me at all).

Results and Discussion

T-tests were conducted to examine the group differences (non-VT PACT and VT PACT) for grade point average (GPA) and the SACQ variables. None of the variables were statistically or significantly different. Table 2 displays the mean and standard deviation for each variable examined in this study.

| | Mean (SD) | |
|-------------------------------|--------------------------------|---------------------------------|
| | Non-VT PACT (control group) | VT PACT (experimental group) |
| First semester GPA | 2.67 (1.67) | 2.79 (2.63) |
| Academic adjustment | 6.69 (1.04) | 6.64 (2.02) |
| Social adjustment | 6.35 (1.81) | 6.40 (1.56) |
| Personal-emotional adjustment | 5.73 (1.13) | 5.91 (2.14) |
| Attachment | 5.17 (2.19) | 6.96 (1.35) |

Table 2: Non-VT PACT and VT PACT Differences.

Grade point averages

Table 2 displays a higher first-semester GPA for The VT PACT participants ($M = 2.79$, $SD = 0.63$) compared to the non-VT PACT participants ($M = 2.67$, $SD = 0.67$). The higher GPA for The VT PACT students can be the result of more academic and social support from their peers as well as the College of Engineering.

SACQ scores

The scores for each variable of the SACQ were divided into three categories: high, medium, and low. Scores ranging from 9 – 6.5 were categorized as high transition scores, scores ranging from 6.49 – 3.5 were categorized as medium transition, and scores ranging from 3.49 – 1 were categorized as low transition. The cut off for these scores were identified by rank-ordering all total scores and identifying the top, middle, and lower third of scores. All of the SACQ variables fell between 4 and 6, which is in the middle of the Likert-type scale. This middle range indicates that the students' perception of their ability to adjust to their first-semester in Virginia Tech's College of Engineering was a medium transition.

Academic adjustment

The academic adjustment subscale measures the student's successes in coping with the educational demands of the college experience. Three examples of questions from this subscale include:

- I have been keeping up to date on my academic work.
- I know why I'm in college and what I want out of it.
- I am satisfied with the level at which I am performing academically.

Middle range scores for this variable are associated with an average GPA (2.0 – 3.0) in the freshman year and feelings of some control over the outcome of one's academic efforts.

Social adjustment

The social adjustment subscale measures the student's successes in coping with the interpersonal and societal demands of the college experience. Three examples of questions from this subscale include:

- I feel that I fit in well as apart of the college environment.
- I am meeting as many people and making as many friends as I would like at college.
- I am very involved with social activities in college.

Middle range scores for this variable are associated with participation in social activities in college, some success in separating from home ties and establishing social autonomy, a lesser sense of loneliness, social avoidance, and social distress.

Personal-emotional adjustment

The personal-emotional adjustment subscale measures the degree to which a student is experiencing general psychological distress. Three examples of questions from this subscale include:

- I have been feeling tense or nervous lately.
- Lately I have been feeling blue and moody a lot.
- I have felt tired much of the time lately.

Middle range scores for this variable are associated with lesser emotional reliance on other people, support from parents, greater degree of mental health and psychological well-being, and lesser degree of psychological distress, anxiety, and depression.

Attachment

The attachment subscale measures the student's degree of commitment to the educational-institutional goals and the quality of the relationship or bond established between the student and the institution. Three examples of questions from this subscale include:

- I am pleased now about my decision to go to college.
- I am quite satisfied with my social life at college.
- I expect to stay at college for a bachelor's degree.

Middle range scores for this variable are associated with lesser likelihood of discontinued enrollment and more overall satisfaction with the college experience.

Conclusion

The goal of The VT PACT is to improve the first-semester GPA and transition of first-year African American males in engineering. Based on the medium transition scores for the SACQ variables and the mean GPAs of 2.67 and 2.79 for non-VT PACT and VT PACT participants, respectively, more initiatives are needed to improve the transition of first-year African American males in engineering. Based on the first two years of The VT PACT and current retention programs for African American men, below are recommendations that can be incorporated into future VT PACT cohorts to increase the GPAs, academic adjustment, social adjustment, personal-emotional adjustment, and attachment of first-year African American males in engineering:

- Formal study hall to help improve the students' study skills and test taking skills
- Formal mentoring between first-year African-American males and upper classmen VT to help students transition from high school to college and to encourage and motivate to excel engineering
- More faculty and staff involvement
- Living learning community to provide the students opportunity to stay with other students with similar backgrounds and interests

Bibliographic Information

1. National Science Foundation. (2004). Women, minorities, and persons with disabilities in science and engineering. Retrieved September 15, 2006, from <http://www.nsf.gov/statistics/wmpd/race.htm>
2. Davis, S., Jenkins, G., & Rameck, H. (2002). *The Pact*. New York: The Berkley Publishing Group. .
3. Grose, T. K. (2006). Trouble on the horizon. *PRISM*, 16(2), 26-31.
4. U.S. Department of Education National Center for Education Statistics (2007). Bachelor's degrees conferred by degree-granting institutions, by racial/ethnic group and sex of student: Selected years, 1976-77 through 2003-04 Retrieved December 15, 2006, from http://nces.ed.gov/programs/digest/d05/tables/dt05_261.asp
5. Cuyjet, M. (2006). *African American men in college*. San Francisco: Jossey-Bass.
6. Webster Dictionary Online December 15, 2006, from <http://www.websterdictionary.com/>
7. Baker, R. W. & Siryk, M. A. (1984). *Student Adaptation to College Questionnaire Manual*. Los Angeles: Western Psychological Services.