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## **Inclusive Learning Environments: A focus on Learning Styles, Gender, and Personality Types**

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African-Americans have struggled to attain higher education since before Abraham Lincoln signed the Emancipation Proclamation in 1863 (Allen & Jewell, 2002; Cokley, 2003). Booker T. Washington, John A. Schultz and George B. Tindall, to name a few, have detailed the risks and dangers that African-Americans took to educate themselves. Stories of slaves routinely beaten and whipped for attempting to read and write demonstrate the intrinsic motivation and commitment to education that African-Americans possessed (Lucas, 1994).

By 1899, no more than 88 African-Americans had been awarded degrees from Predominately White Institutions (PWIs), mostly from Oberlin College (Lucas, 1994), while an estimated 475 African-Americans had graduated from Historically Black Colleges and Universities (HBCUs). A 1928 survey conducted by W. E. B. DuBois reveals that fewer than 14,000 African-American students received college-level instruction, and by 1939, only 119 doctoral degrees had been conferred upon African-American students by PWIs (Lucas, 1994). In 1914, the president of Harvard closed its dormitories to African-Americans; while they continued to be admitted, they were not encouraged to socialize with White students (Lucas, 1994).

Since the 1970s, doors of PWIs, including many state comprehensive universities (SCUs), have opened for African-Americans. However, African-Americans enrolled at these institutions tend to be less successful than White students as evidenced by the attrition disparity (Thelin, 2004). As SCUs enroll a substantial portion of students of color attending four-year institutions of higher learning due to proximity and cost, it is important for stakeholders at these institutions to understand how best to serve all constituents (Henderson, 2007). An institution's ability to properly serve all students will decrease factors that are detrimental to their students' persistence (Kimbrough, Molock, & Walton, 1996). Though there are many factors that affect the academic achievement of students, cultural awareness is especially important for African-Americans.

Researchers have examined many outside classroom assistance programs, such as orientation programs, mentoring programs, and learning support services, yet the retention and persistence of African-American college students continues to fall behind many of their counterparts (Astin, 1996). Since much of the literature in assisting African-American college students involves out-of-class efforts, it may be beneficial to look at the learning styles of African-Americans within the context of the classroom (Rodgers, 2000). As a result, this study will look at only African-American college students to realize if type or gender is more associated with Separate and Connected learners within this group. In particular, is gender or type-preferences associated more with Separate or Connected learning? Using a mixed method, this study intends to find out what attributes to the African-American college students' learning style, so as to better prepare those who serve these students to provide a more effective academic experience.

### **Literature Review**

This study was conceptualized by examining the following: Thinking and Feeling personality types, Separate and Connected learning styles, gender-conditioning and cultural conditioning.

*Personality types and learning styles.* Belenky, Clinchy, Goldberger, and Tarule (1986) first introduced the concept of procedural knowledge of Separate and Connected learning styles. Belenky et al. theorized five types of learning from which women perceive themselves and approach the world: silence, received knowledge, subjective knowledge, procedural knowledge, and constructed knowledge. A person exhibiting a silent learning style blindly follows authority, sticks with stereotypes, and has a difficult time defining oneself. With received knowledge, one listens to the voices of others, whereas with subjective knowledge, one listens to oneself and severs the sense of obligation to follow others' views. In constructed knowledge, one integrates his or her own opinions and sense of self with reason and influence from the outside world. Finally, procedural knowledge consists of Connected learning and Separate learning. Connected learners believe truth to be "personal, particular and grounded in firsthand experience" (Belenky, et al., 1986, p. 113). They attempt to find truth through listening, empathizing, and taking impersonal stances to information, whereas Separate learners completely exclude their feelings from making meaning and rely strictly on reason.

Belenky et al. saw that the way women think about education and learning also affects their self-perception. Most women prefer a Connected learning style, while most men prefer a Separate style (Perry, 1970). These attributes are logically similar to the characteristics of persons preferring

Thinking (T) and Feeling (F) in Jung's (1921) theory of psychological types. Jung's (1921) and Myers and Briggs' (1980) theories have four polar dimensions—Extraversion (E) and Introversion (I), Sensing (S) and Intuition (N), Thinking (T) and Feeling (F), and Perception (P) and Judgment (J). For this study, the Thinking and Feeling dimension is the central focus. A person with a Thinking-type preference is described by Myers-Briggs as one who makes judgments or decisions using logic, criticism and analysis. A person with a Feeling-type preference makes judgments or decisions using empathy, subjectivity and feelings. Everyone can exhibit both forms of judgment but, in general, prefers one to the other.

*Gender-Conditioning.* According to West and Fenstermaker (1995), societal norms play an active part in shaping gender identity and roles. Gender refers to socially defined and learned behavior that shapes the opportunities that one is offered in life, the roles one may play and the kinds of relationships that one has. It is distinct from sexuality, which is a biologically determined (West & Fenstermaker, 1995). They found that gender-conditioning affects masculinity and femininity roles, status, norms, and values, as well as responsibilities, needs, and expectations. Gender also affects sexual behavior, the division of labor, power, and the distribution of resources and rewards (West & Fenstermaker, 1995).

Connell (1987) found that traditional male and female gender roles may lead to the acceptance of certain behaviors and the belief that these behaviors are "natural" to that gender. For example, traditional gender characteristics would suggest that males are strong, aggressive, dominant, and invulnerable; whereas females are nurturing, weak, passive, emotional, and gentle. Given these characteristics, it would be easy to see how the traditional male stereotype encourages a dominant/perpetrator role, while the traditional female stereotypes encourage a submissive/victim role (West & Fenstermaker, 1995).

Connell also found unfortunate side effects of such stereotyping. Both genders accept limitations imposed upon them and allow stereotypes to direct behavior. As males are not traditionally viewed, nor often view themselves, as being emotional or intimate, many males experience a fear of intimacy or emotions as weakness. Some men may also experience frustration in their failure to achieve "socially defined" expectations such as being the "breadwinner" (Connell, 1995). Given structural and racial bias against African-American men, this expectation may be especially hard on them.

According to Connell (1987), many women do not explore their capabilities of exercising traditionally "male traits," such as aggressiveness or independence. As a result, they may feel powerless to take action in a range of situations, particularly if their personal safety is threatened

(Connell, 1987). Such restrictions may not be the case, however, for many African-American women. Due to the large number of African-American single parent homes, where only the mother is present, these women may be forced to develop a greater level of autonomy and assertiveness.

Connell also found that traditional gender roles are slowly changing, bringing about a vast number of positive outcomes for both genders, including freedom for both men and women to explore and develop new roles based on personal choices rather than gender stereotypes, equality of interaction between genders, and increased social, domestic, and career opportunities. While this change is still evolving, an expectation to conform to traditional gender roles still exists with many members of society (Connell, 1987).

*Issues of Cultural Conditioning.* Nichols (1998) compared and contrasted broad cultural differences that are part of the conditioned learning of its members. He examined European American, African-American, Hispanic, Asian, and Native American cultures. Nichols found comparisons of European American and African-American cultures were relevant. He compared values, epistemology, logic and processes used in cultures. The highest cultural values for African-Americans are interpersonal relationships and leading the people. For example, if achievement on a job or helping a person in distress were in conflict, Nichols believes that African-Americans might leave work to help another and not put work as the first priority. African-American students would want interpersonal relationships with their teachers, as well. In short, the values in their cultural conditioning were closer to Feeling and Connected learning than Thinking and Separate learning. For European American culture, individual achievement is the highest value and not interpersonal relationships, values more like Separate learning.

According to Nichols (1998), epistemology, or learning style, is more logical in European American culture and more experiential in African-American culture. Rationality is expressed in quantitative science and engineering. Affect is expressed through experiential learning, reflection, and emotions. Once again, European American culture is more Separate and African-American culture more Connected, using Nichols' (1998) analysis. Logic is expressed through values and feelings in the African-American culture versus either dichotomies or in-system analysis in European-American Culture. Again, African-American culture is closer to Feeling and Connected learning and European America culture is closer to Thinking and Separate learning. Finally, Nichols characterizes African-American culture as using processes that emphasize human and spiritual networks as compared to the modern and post-modern debates in European American culture.

## Quantitative Methodology

In this study, the Myers-Briggs Type Indicator (MBTI) Form M was used to measure the F and T preference. Form M consists of 93 items that have been revised to reflect social and cultural changes from MBTI inventory G. The new form contains updated item wording and removes outdated language, increasing the instrument's capacity to differentiate at the midpoint of each scale, which is an important issue in measuring people with close preferences. It bases item weight on a national sample of adults, which includes diverse groups according to gender, race, ethnicity, religion, and socioeconomic status. It eliminates research items used on Form G. It improves the item-to-scale correlations and lower scale inter-correlations. It also eliminates separate gender scoring, minimizing the influence of social desirability in responses to the items with more than two response options (Myers et al., 1998).

The MBTI Form M divides personality type according to four dichotomous dimensions. Below is a summary of the reliability and validity of the new MBTI Form M: the split half reliabilities for the MBTI Form M showed an improvement from Form G, ranging from .91 on the I and E dimension, .92 on the N and S and P and J dimensions, and .89 on the F and T dimension (Myers et al., 1998). A summary of the Form G data suggests, however, that sample characteristics, particularly those related to type development, may result in variation in reliabilities across groups. The internal consistency of the four MBTI scales was estimated using coefficient alpha, which is the average of all of the item correlations (Myers et al., 1998, p. 161). In the national sample (N=2,859), internal consistency ranged from .93 for the F and T preference to .95 on the N and S dimension (Myers et al., 1998).

Myers et al. found that the consistency of the four MBTI scales is quite high in all samples available to date, whether computed using logical split-half, consecutive item split-half, or coefficient alpha. There has been a substantial improvement in Form M reliabilities over those of Form G in samples collected so far. Test-retest reliabilities of the MBTI show consistency over time, with levels of agreement much greater than by chance. When subjects report a change in type, it is most likely to occur in only one preference and in scales where the original preference clarity was low. The test-retest reliabilities of Form M are improved over those of Form G. The reliability coefficient for T and F remains the lowest of the four scales.

A new method for estimating measurement precision is available with the use of the Item Response Theory (IRT). This method is based on calculating the amount of information that is available from each item that can be used to discriminate people of opposite preferences.

Form M has a greater precision than all of the other scales used to measure the MBTI (Myers et al, 1998).

The factor structure of MBTI item pools provides evidence of the construct validity of the MBTI assessment tool. When examining factor analytic studies, it is important to select an item pool that is appropriate for the question being asked. If the research question involves the four preference scales, then the items of interest are only those items that are used to score the four preference scales of the MBTI. For this study, these were the 93 items that were used in the Form M scoring.

According to Myers et al., 1998, a number of exploratory factor analyses of the MBTI scales have demonstrated very close correspondence with the hypothesized four-factor structure. More rigorous confirmatory factor analysis provides even stronger support for the model. Correlations of the four preference scales with a variety of scales from other instruments support the predictions of type theory regarding the meaning of and the behaviors believed to be associated with the four dichotomies. Evidence for the dichotomous nature of the scales was seen in plots of preference scores against external variables. Analysis of these plots demonstrated that the only significant differences between successive groups of scores were exactly at the midpoint of the scales, which was also where the major changes in direction and slope was observed (Myers et al., 1998).

### **Qualitative Methodology**

*Mansfield and Clinchy Interview Protocol.* The two learning styles, Separate and Connected, are rated from the qualitative interview designed by Mansfield and Clinchy (1992). Two trained individuals rated the interview responses in order to classify them as preferring Separate or Connected learning. If these two individuals disagreed, they were instructed to meet and discuss the protocol. If they agreed after the discussion, the decided style would be used. However, there were no instances in this study where the raters did not come to an agreement. The rating criteria used is from the Women's Ways of Learning (Belenky, et al., 1986) rating manual.

The interviewer used the following stimuli, representing the Separate style, in order to obtain ratable data: "I never take anything for granted. I just tend to see the contrary. I like playing the 'devil's advocate'—arguing the opposite of what somebody's saying, thinking of exceptions, or thinking of a different train of logic." The stimulus used to represent the Connected style included: "When I have an idea about something and it differs from the way another person is thinking about it, I'll usually try to look at it from that person's point of view—see how they could say that, why they think that they're right, why it makes sense."

Each participant was asked how both quotes “struck” them, and when/where/with whom they would or would not use each style. They were also asked to reflect on the purposes for each style and how difficult or easy those behaviors might be for them. Finally, each participant was asked to which style they best related and how they would expand their style, in light of the interview.

Interviews lasted between 30 and 45 minutes. Each interview was audio-recorded and transcribed. The transcripts were rated by individuals who had no knowledge of the participants’ gender or psychological type, using the manual first developed for identifying Connected and Separate learning styles in the 1986 study.

*Population and Sample.* The participants for this study were randomly selected from African-Americans college student from a state, comprehensive university, ages 18 to 25. The participants were first contacted via email, wherein the message explained the purpose of the study and asked them to participate. The message also asked these students to take the MBTI Form M. It further explained that some of them would be asked to participate in a follow-up interview at a later date. Those who accepted were invited to a workshop on personality type and learning style after the study was completed.

*Procedures.* This group of participants first took the MBTI Form M instrument, which assesses personality type. 148 students were given special instructions to complete the inventory by the researcher, who had been trained in this protocol. First, they were told to take as much time as needed to complete the inventory. Next, the researcher explained that the assessment is a force-choice questionnaire, which means they needed to choose one of the two responses. If they found that the two responses were equally appealing, then they were asked to choose one that they would be happiest using for the rest of their lives (Myers et al., 1998).

After completion of the inventories, participants were scored using Form M templates. These scores have a rating of either Slight, Moderate, Clear, or Very Clear on four dimensions: Extraversion and Introversion, Sensing and Intuition, Thinking and Feeling, and Judging and Perceiving. Furthermore, these scores indicate in which direction the participants answered consistently. After the participants completed the MBTI, 66 were interviewed for their learning styles using Mansfield and Clinchy (1992) protocol. This interview was designed to determine the learning styles, Separate or Connected, based on the Belenky et al. (1986) theory.

*Data Analysis.* This study consists in part of a correlational analysis. Relationship analysis employs a structural use of statistics to analyze a theoretical system or systems (Sax, 1968). The theoretical systems, which this study examines, are psychological type measured by MBTI

Form M and gender and learning styles measured by Mansfield and Clinchy's (1992) interview protocol.

This analysis looks at how these three variables are related to each other. According to Sax (1968), this type of methodology stems from John Stuart Mill's canon of concomitant variation which states, "Whatever phenomenon varies in any manner whenever another phenomenon varies in some particular manner, is either a cause and effect of that phenomenon, or is connected with it through some fact of causation" (p. 263).

Correlational studies only demonstrate that a relationship between two or more variables either exists or not. This study cannot claim that type or gender causes learning style, or vice versa. This study investigated only if there is a relationship or not. If there is not a relationship found, then there is not a causal relationship present. If a relationship is found, the study then points in the direction in which studies can go to test causal hypotheses (Sax, 1968).

Generalized Linear Models (GLM) is used to analyze the data. GLM observes which predicted variables are more significantly related with the response variable. When GLM is used it makes no assumptions about data. Regardless of the distribution or the frequency of the data, GLM is useable. GLM analyzes data that is not normally distributed. The GLM was used in this study due to the categorical data involved.

## Results

The goal was to obtain 120 participants to complete the interview: 30 Thinking males, 30 Feeling males, 30 Thinking females, and 30 Feeling females. Having a set number of participants in each of the categories would increase the probability for obtaining five participants in the eight categories (Separate Thinking Male, Separate Feeling Male, Connected Thinking Male, Connected Feeling Male, Separate Thinking Female, Separate Feeling Female, Connected Thinking Female, and Connected Feeling Female). Having at least five participants in each category would allow the researcher to use log-linear analysis for analyzing the data. However, Table 1 reflects the actual gender and type distribution for this study, while Table 2 gives an actual breakdown of the number of participants interviewed: male, female, Thinkers and Feelers.

The sample of males was more widely distributed among the different type categories than the females (see Table 3). There was only one empty type category (INTP). On the other hand, the females had five empty type categories (ISTP, INTP, ESTP, ENTP, ENTJ) (see Table 4). Therefore, the results among the women may not be as representative of the population studies as the men. Note, there are five empty type

Category	Male	Female	Total
Thinking	20	24	44
Feeling	21	83	104
Total	41	107	148

Table 1. Actual Gender and Type Distribution. Note: The actual number of participants interviewed was less than the anticipated number due to students who were not responsive to the invitation to participate. There were also students who did respond but declined to participate.

Participants	Male Thinkers	Female Thinkers	Male Feelers	Female Feelers	Total
Interviewed	14	12	14	26	66
Not Interviewed	6	14	7	57	82
Total	20	24	21	83	148

Table 2. Actual Number of Participants Interviewed.

ISTJ N=1 Interviewed: S (3.5%)	ISFJ N=1 Interviewed: C (3.5%)	INFJ N=2 Interviewed: S,C (7.1%)	INTJ N=1 Interviewed: S (3.5%)
ISTP N=3 Interviewed: C, S, S (10.7%)	ISFP N=2 Interviewed: C, C (7.1%)	INFP N=2 Interviewed: C, S (7.1%)	INTP N=0 Interviewed: (0.0%)
ESTP N=2 Interviewed: S, S (7.1%)	ESFP N=1 Interviewed: S (3.5%)	ENFP N=3 Interviewed: C, C, C (10.7%)	ENTP N=2 Interviewed: S, C (7.1%)
ESTJ N=1 Interviewed: S (3.5%)	ESFJ N=2 Interviewed: C, S (7.1%)	ENFJ N=1 Interviewed: S (3.5%)	ENTJ N=4 Interviewed: S, S, S, S (14.2%)

Table 3. Interviewed Male type Distribution. Note: It was the desire of the researchers to have as many of the 16 types represented as possible to avoid any possible bias from other preferences. Only 1 of the 16 types is not represented in this table.

categories in Table 4. This is acceptable but not as desirable as the men’s profile in Table 3. The missing types are all T types and mostly P types.

At least five participants were needed for the eight categories (Separate Thinking Male, Separate Feeling Male, Connected Thinking Male, Connected Thinking Female, Separate Thinking Female, Separate Feeling Female, Connected Thinking Female, and Connected Feeling Female) in order to analyze data using Log-Linear Analysis. However, Table 7 reflects the actual distribution of participants’ gender, Male and Female, learning styles, Separate and Connected, and psychological type, Think-

ISTJ N=3 Interviewed: C, S, C (8.0%)	ISFJ N=5 Interviewed: S, C, C, C, C (13.0%)	INFJ N=3 Interviewed: C, C, C (8.0%)	INTJ N=3 Interviewed: S, S, S (8.0%)
ISTP N=0 Interviewed: (0.0%)	ISFP N=1 Interviewed: S (3.0%)	INFP N=2 Interviewed: C, C (5.0%)	INTP N=0 Interviewed: (0.0%)
ESTP N=0 Interviewed: (0.0%)	ESFP N=1 Interviewed: C (3.0%)	ENFP N=7 Interviewed: C, C, C, C, C, C, C (18.0%)	ENTP N=0 Interviewed: (0.0%)
ESTJ N=6 Interviewed: S, S, S, S, S, S (3.5%)	ESFJ N=4 Interviewed: C, C, C, C (11.0%)	ENFJ N=3 Interviewed: C, C, S (8.0%)	ENTJ N=0 Interviewed: (0.0%)

Table 4. Interviewed Female Type Distribution.

Learning Style	Thinking type			Feeling Type		
	Male	Female	Total	Male	Female	Total
Separate	12	10	22	5	3	9
Connected	2	2	4	9	23	31
Total	14	12	26	14	26	40

Table 5. Actual Type, Learning, and Gender Distribution.

GLM Formula	learning ~ gender + type, family = binomial, data=results				
Deviance results	Min	1Q	Median	3Q	Max
	-1.9728	-0.4952	-0.4952	0.6039	2.0782
Coefficients	x	Estimate	Std. Error	z value	Pr(> z )
	Intercept	-2.0368	0.6115	-3.331	0.000866***
	Gender	1.4491	0.8276	1.751	0.079958
	Type	3.6463	0.9869	3.695	0.000220***
Signif. Codes: 0'***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Dispersion parameter for binomial family taken to be 1					
Null Deviance: 90.949 on 65 degrees of freedom					
Residual Difference: 59.149 on 62 degrees of freedom					
AIC: 67.143					

Table 6. Generalized Linear Model for Binomial Model Statistical Report.

ing and Feeling. Three categories, Connected Thinking Male, Connected Thinking Female, and Separate Feeling Female, did not have five participants; therefore, log-linear analysis could not be used for this study.

The percentages of the participants' type and learning style in relation to their gender in this study are: 85% of Thinking men were Separate; 83% of Thinking women were Separate; 64% of Feeling men were Connected; and 88% of Feeling women were Connected. Overall, regardless of the participants' gender, 84% of Thinkers were rated Separate, while 77% of Feelers were rated Connected. Perhaps Feeling men are most susceptible to gender cultural influences at 64%; nevertheless, the majority associated with type.

*Statistical Results.* The GLM analyzes whether gender or type is more significantly associated with the response variable of Connected and Separate learning styles. Table 6 provides the statistical report of the results for this study. The table does not list the response variable; however, it does include the predicted variables. It is also important to note that the probability (p-value) determines whether the reported statistics are significant. The lower the p-value, the lower the probability that the observed statistics did not occur by chance. For the purposes of this study, the p-value used is 0.01. This value indicates that the analysis is 99% certain that the observed statistics did not occur by chance.

*Quantitative Results.* Table 6 explains the GLM for Binomial Model for this study. It shows that the effect of type is significant with the learning style at the level  $p > 0.0002$ , whereas the effect of gender is not significant at the  $p > 0.0799$  with the learning style. Thus, type is associated more with learning style than is Gender. Type and learning style have a significant association.

## Discussion

The strict sample requirement was a major factor in the limitations of this study. The current study sought participants whose age ranged from 18 to 25 and were of African or Caribbean descent. There were also participants who were interested in participating in the study but indicated that they were not U.S. citizens. The list of African-American students that actually received the email and were U.S. citizens is estimated to be 250. From that sample, 148 participants completed the MBTI inventories, and only 66 of the 129 invited students for the interview participated. Despite the fact that the sample of only 148 participants was used for this study, it is important to note that the 148 participants were randomly selected from the pool of 350.

The consistencies as well as wording of the questions in the interview protocol were limitations of the current study. In order to improve the

Separate and Connected quotes' reliability, they should be consistent with one another. The Separate learning quote includes descriptions of behaviors that a person might demonstrate who use this style; whereas the Connected learning quote does not. It would be more appropriate for either both quotes to have descriptions of behaviors, or eliminate the descriptions from the Separate learning quote.

In addition to increasing the interview protocol consistencies, the wording of some questions in the interview need evaluating. There are questions in the interview protocol that were not clear (see Appendix C). For example, these specific questions: "How does this strike you?" "Give specific examples of when you have used one or both", and "Can you describe ways in which you might broaden your approach?" Many of the participants expressed that they did not understand exactly what the question was asking due to the wording. The lack of clarity in the wording limited the substance of the responses. Furthermore, the interview protocol groups questions together, for instance: "Has anyone treated you in that way?" "How did you feel about it?" In many instances, participants would not answer one of the questions asked. Hence, each question should be asked separately in future studies.

During this study the researcher contacted and attended a variety of student organization meetings. When the researcher was allowed to attend the organizational meetings, students were informed about the study and were asked to participate. However, not many of the students wanted to stay after the meeting to complete the MBTI inventory. Furthermore, the atmosphere usually was not conducive for taking the MBTI inventory. Moreover, there were a number of students who completed the MBTI inventory, who did not wish to participate in the interview section of the study.

The current research was conducted in a predominately White state, comprehensive university. The African-American student population comprised only 3% of the total student body. It would be beneficial to conduct such a study at a HBCU to increase the sample size. A larger sample size would increase the ability to generalize the results to the African-American student population.

## **Implications**

Implications of practice for this study include the necessity for the creation and implementation of more individualized learning environments. This kind of learning environment will require instructors to take into consideration that all students are different. In order to implement this type of learning, it will take some effort and change on the part of institutions of higher education. These efforts will show a commitment to

providing the highest level of academic service. Instruction will require a level of inclusiveness of the various types of learning styles within the curriculum. Teachers will have to consider the many different individuals who are being educated, who may not be part of the broader culture. This consideration will entail furthering the education of the individuals who are providing the instruction about learning styles, personality type and gender-conditioning, an increased sensitivity to understanding the various population of students and their differences. In addition to an increased awareness and sensitivity, employing assessment processes of the preferred learning styles and personality types of the students will also be necessary. After conducting this study, the finding suggests the following implications:

- More research should be conducted regarding the relationship of personality type and African-American college students.
- Higher education professionals need to look further into other factors than culture and gender-conditioning, such as personality type, when assessing the academic achievement of African-American college students.
- The Myers-Briggs Type Indicator should be given to college students and incorporated into the development of curriculum and instruction.
- Professors should be provided training and given information with regard to accommodating the various personality types of the students whom they teach.
- Professors should be provided training and given information involving the Separate and Connected learning styles of college students.
- The learning styles of college students should be taken into consideration in the development of curriculum and instruction.

### **Recommendations for Further Study**

As previously stated, the current study was conducted at a PWI. If this same study is conducted at a HBCU, there may be a difference in the results. This study could also be conducted at single-gender institutions, as well, to investigate whether cultures at various types of institutions have an effect on the results.

As it pertains to this study, the information provided by Nichols (1998) did not coincide with the results section of this study. The students in this study most likely adhered to the dominant cultural conditioning of the European American educational system. Hence, a binary study may need to be conducted with both first-year and graduating African-American college students to further investigate that speculation. In addition to a binary study, a second interview with those students who preferred the opposite learning

style of their type preference might be needed to qualitatively explore how and why their learning style preference varied from their type preference.

## Conclusion

This study demonstrated a relationship between learning styles and psychological types. The focus of this study was on 66 African-American college students, ages 18-25. These students are U.S. citizens and are of Caribbean or African descent. This study is a follow up to Rodgers' studies conducted in 1992, 1998 and 2000. In Rodgers' studies, there were 120 U. S. college students, ages 18-25, and it found that psychological type was associated more with Separate or Connected styles than gender. Men and women who preferred Thinking favored the Separate learning style; while men and women who preferred Feeling favored the Connected learning style. The results for the current study were very similar with 85% of Thinking men as Separate; 83% of Thinking women as Separate, 64% of Feeling men as Connected; and 88% of Feeling women as Connected. Overall, regardless of the participants' gender, 84% of Thinkers were rated Separate while 77% of Feelers were rated Connected. However, a few Thinking type females preferred Connected and vice versa for males (Rodgers, 1998). This was also the case in the current study. There were a few Thinking types who preferred the Connected style and vice versa. This study demonstrated a relationship between learning styles and psychological types.

The results from this current study corroborate three of the previous studies by Ullman-Petrash (1993), Rodgers (1998) and Rodgers (2000). The GLM for Binomial Model was used to test whether type and learning style would be statistically significant with African-American college students. The Generalized Linear Models for Binomial Model tested the relationships and interactions of the gender, type and learning style. According to the GLM for Binomial Model, the researcher concluded that the effect of psychological type is significant at the p-value of 0.00 with the learning style. Furthermore, the effect of gender was not significant when the learning style was at a p-value of 0.07. In addition to the GLM for Binomial Model, correlational studies of Rodgers (2000) and Williams (2000) and the current study further supported that the psychological type, Thinking and Feeling, are statistically significant with the learning styles, Separate and Connected. The GLM for Binomial Model for Rodgers' (2000) study reported that the relationship between personality type and learning style was significant (p-value of 0.00), whereas the effect of gender and learning style was not significant (p-value of 0.80). The results of the GLM for Binomial Model for Williams (2000) reported that the relationship between personality type and learning style demonstrated significance (p-value of 0.001). The current study showed concurrence.

This study indicates that psychological type and learning style are, in fact, related for African-American college students. Moreover, critical to the findings of this study is that culture does not affect the learning styles of these students. Although the results of this study conducted with African-American college students were similar to the general student population in Rodger's study (1998), it is important to recognize the distinct differences. This implies that it is imperative for higher education professionals to be cognizant of the possible differences that can exist between style and psychological type. However, it is even more important to know an individual's type above gender, due in large part to there being more female Feeling types and male Thinking types in the general population of the U.S. database.

This study reports that Connected African-American males may prefer to learn in Separate environments. It was speculated that this preference was associated with influences from family, peers or other conditioning factors. Therefore, higher education professionals should be equipped to serve everyone, no matter the race or culture. Since SCUs have a tradition of serving a broad range of learners, these institutions in particular should play close attention to the various factors that increase the success of their students. According to the American Enterprise Institute almost 70 percent of all students enrolled in a public four-year school attend SCUs (Schneider, 2014). Moreover, this study is linked to Universal Design Instruction (UDI), a theoretical construct based on research in inclusive learning environments and best practices for teaching (Rose & Meyer, 2006). According to UDI common understanding is needed of the nature of inclusive instruction and its potential efficacy in increasing the quality and reach of education (McGuire & Scott, 2006; Tinto, 2008). Universal design for learning provides a much-needed framework for discussing inclusion in education. Notably, it provides clear recommendations for proactively addressing inclusion issues from a broad perspective including race, class, gender, and/or ability. If SCUs are to maximize their existence and continuance it is imperative that they consider such theories.

The more SCUs understand about students of color, the greater the chances of increasing their learning outcomes and overall collegiate experience. SCUs play an important role of educating a large segment of the population. Thus state comprehensive universities can benefit from this research increasing its chances to ensure that all its students have increased opportunities to attain a quality education and overall experience.

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