

CONSTRUCT VALIDITY, RESPONSIVENESS, AND DEMOGRAPHIC PREDICTORS OF THE  
INVENTORY FOR ASSESSING THE PROCESS OF CULTURAL COMPETENCE AMONG  
HEALTHCARE PROFESSIONALS – STUDENT VERSION (IAPCC-SV©)

A DISSERTATION  
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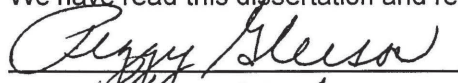
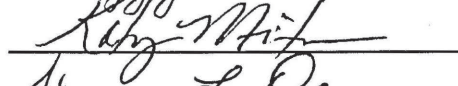
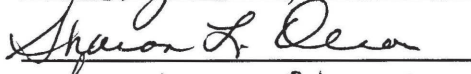
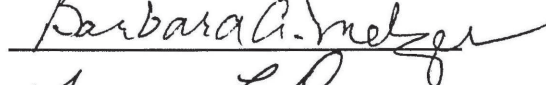
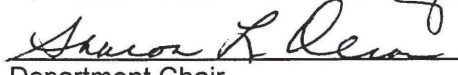
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To the Dean of the Graduate School:

I am submitting herewith a dissertation written by Suzanna Dougherty Okere entitled "Construct Validity, Responsiveness, and Demographic Predictors of the Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals – Student Version (IAPCC-SV©)." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Physical Therapy.

  
Peggy Gleeson, Ph.D., Major Professor

We have read this dissertation and recommend its acceptance:

  
  
  
  
  
Department Chair

Accepted:

  
Dean of the Graduate School



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## DEDICATION

To my parents, for instilling in me the importance of never letting the fear of failure prevent one  
from attempting to succeed.

To my husband, Odindu, your continuous support means more to me than I can express.

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## ABSTRACT

SUZANNA DOUGHERTY OKERE

### CONSTRUCT VALIDITY, RESPONSIVENESS, AND DEMOGRAPHIC PREDICTORS OF THE INVENTORY FOR ASSESSING THE PROCESS OF CULTURAL COMPETENCE AMONG HEALTHCARE PROFESSIONALS – STUDENT VERSION (IAPCC-SV©)

MAY 2012

The IAPCC-SV© measures the cultural competence of student healthcare professionals. However, the psychometric properties of the instrument have not been documented for student physical therapists. The purpose of this study was to document the IAPCC-SV's© construct validity, responsiveness, and demographic predictor variables. Student physical therapists in the State of Texas (n=303) participated in this study. The IAPCC-SV's© construct validity was examined via factor analysis. The instrument's responsiveness was assessed by comparing IAPCC-SV© post-test scores of the control (professional behaviors module) and experimental (cultural competence module) groups, while controlling for pre-test score. Regression analysis was used to determine if the cultural composite survey score predicted IAPCC-SV© score, and majority/minority status, over and above cultural composite score, predicted IAPCC-SV© score. The alpha level was set at  $p < .05$  for all tests of significance. This investigation identified a 3 factor structure, as opposed to the proposed 5 factor structure, for the IAPCC-SV©. The instrument was responsive to changes in students' cultural competence as evidenced by significantly higher post-test scores of the experimental group (cultural competence module) when compared to the control group (professional behaviors module)  $F_{1,32}=26.56$ ;  $p < .001$ . Majority/minority status was not a significant predictor of IAPCC-SV© score over and above cultural composite score  $F_{1,270}=2.66$ ;  $p = .11$ . Cultural composite score was a significant predictor of IAPCC-SV© score,  $R^2 = .22$ ,  $F_{1,271}=77.16$ ;  $p < .01$ . This investigation did not support the proposed 5 factor structure of

the IAPCC-SV©; however, there was preliminary support for several of the proposed factors. The IAPCC-SV's© responsiveness to changes in student physical therapists' cultural competence suggests it may be an appropriate instrument to use as an outcome measure with student physical therapists. Although the cultural composite score predicted IAPCC-SV© score, additional research is necessary to identify other predictors of IAPCC-SV© score, since the percent of variance accounted for by the cultural composite score was low.

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## CHAPTER I

### INTRODUCTION

#### **STATEMENT OF THE PROBLEM**

There is a clear disparity between the general population demographics in Texas and the demographics of practicing physical therapists (PTs) in Texas. Therefore, it is likely that PTs in the State of Texas will be caring for patients from a culture or background different than their own. The Commission for Accreditation in Physical Therapy Education (CAPTE) requires that physical therapist (PT) education programs prepare students to care for patients in a culturally competent manner to maximize the quality of care delivered to patients.<sup>1</sup> However, the properties of instruments used to measure the cultural competence of PT students have not been well documented. Furthermore, variables that may predict the cultural competence of PT students have not been thoroughly studied.

#### **CLINICAL RELEVANCE**

Improving the cultural competence of student PTs is one of the current strategies for decreasing the health disparities of racial and ethnic minorities.<sup>2</sup> Documenting the properties of cultural competence assessment tools is the first step to identify student PTs' cultural competence. This study's results will assist PT education programs in determining if the Inventory for Assessing the Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV©)<sup>3</sup> is an appropriate instrument to assess the cultural competence of PT students entering their program. In addition, identifying predictors of cultural competence can be a cost effective way of estimating PT students' cultural competence.

## REVIEW OF LITERATURE

In 2012, the population of Texas was estimated as 43.5% Anglo, 40.2% Hispanic, and 11.5% Black.<sup>4</sup> According to Jennifer Jones, Executive Assistant, Executive Council of Physical Therapy and Occupational Therapy Examiners for the State of Texas (written communication, January 2012), the 2012 Texas PT demographics were 73.9% Caucasian or White (not of Hispanic Origin), 6.9% Hispanic, and 3.6% African American (not Hispanic). These marked racial/ethnic disparities between the patient and PT populations suggest that therapists in the state of Texas will be caring for patients of a different culture.

CAPTE expects that graduating PTs provide care with respect for cultural differences. The CAPTE Standards incorporate cultural competence into more than 10 CAPTE criteria with which PT education programs must demonstrate compliance.<sup>1</sup> The American Physical Therapy Association (APTA) Vision Statement for Physical Therapy 2020<sup>5</sup> states, "They [physical therapists] will provide culturally sensitive care distinguished by trust, respect, and an appreciation for individual differences." Therefore, PT education programs are required, through professional standards, to prepare students to care for patients in a culturally competent manner.

The APTA Committee on Cultural Competence has released a *Blueprint for Teaching Cultural Competence in Physical Therapy Education (Blueprint)* to assist PT education programs with incorporating cultural competence education into their curricula.<sup>2</sup> The current strategy is to improve the cultural competence of PTs in order to decrease health disparities. In an effort to guide PT education programs on how to improve cultural competence of PTs, the Committee on Cultural Competence has adopted the Campinha-Bacote model.<sup>3</sup> Campinha-Bacote<sup>6</sup> proposed the Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals (IAPCC©) which is based upon the Campinha-Bacote model<sup>3</sup> to measure the cultural competence of healthcare providers. The original instrument was later revised, resulting in the Inventory for Assessing the Process of Cultural Competence Among Healthcare

Professionals - Revised (IAPCC-R©).<sup>3</sup> Capell et al<sup>7</sup> and Brathwaite<sup>8</sup> have established preliminary support for the construct validity of the IAPCC-R©.

Campinha-Bacote<sup>3</sup> modified the instrument for use with student healthcare professionals, resulting in the Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV©). The construct validity of the IAPCC-SV© cannot be assumed from the IAPCC-R© studies. However, since the IAPCC-SV© is largely based upon the IAPCC-R©'s constructs and content, it is reasonable to suggest that there is preliminary support for the IAPCC-SV©'s construct validity. To date, the principal investigator did not identify any published studies that have examined the IAPCC-SV©'s construct validity via factor analysis. In 2010, Okere et al<sup>9</sup> established the IAPCC-SV©'s internal consistency (Cronbach's alpha=.75) and test re-test reliability (ICC (2,1)=.87) with one cohort of 40 students enrolled in a Doctor of Physical Therapy curriculum. In this study, all students also participated in a cultural competence learning module based upon the Campinha-Bacote model<sup>3</sup>, and global rating of change scores were tabulated to confirm that the module was successful in changing the cultural competence of those students. Since this investigation did not have a control group, the IAPCC-SV©'s responsiveness could not be established. No demographic information was collected on the participants; therefore, no demographic variables could be examined for their ability to predict the students' cultural competence. Before the IAPCC-SV© is widely used with PT students, the following IAPCC-SV© properties need to be examined: construct validity, responsiveness, and demographic variables that may predict the IAPCC-SV© total score.

While no published studies were identified that have examined the IACPP-SV's construct validity via factor analysis, two studies have examined the IAPCC-R©'s construct validity via factor analysis.<sup>10,11</sup> Both of these studies were performed outside of the United States. In 2010, Olt et al<sup>10</sup> performed a confirmatory and exploratory factor analysis on a translated and adapted Swedish version of the IAPCC-R©, and the analysis did not confirm the instrument's 5 factor



structure. However, since Olt et al did not identify any published factor analyses of the IAPCC-R© English version, they could not determine if the results were due to the Swedish translation and adaptation, or the construction of the instrument's English version. In 2007, Ho and Lee<sup>11</sup> performed an exploratory factor analysis using the IAPCC-R© with Taiwanese medical students and concluded that there was no "identifiable factor structure" for the IAPCC-R©. The results of these two factor analysis studies should be interpreted with caution since both studies were performed internationally and neither study utilized PT students. In addition, these studies utilized the IAPCC-R©, not the IAPCC-SV©.

The literature examining the IAPCC-SV©'s responsiveness is also limited. However, Musolino et al<sup>12</sup> examined the IAPCC-R©'s responsiveness with PT students. Musolino et al reported IAPCC-R© scores of PT students were significantly higher at post-test, following participation in a cultural competence learning module, when compared to pre-test. In addition, the IAPCC-R© scores of PT students who participated in a cultural competence learning module (experimental group) were significantly higher than IAPCC-R© scores of PT students who did not participate in a cultural competence learning module (control group). The Musolino et al study provides preliminary support that the IAPCC-R© is responsive to differences in, and changes to, the cultural competence of PT students. Additional research is necessary to document the IAPCC-SV©'s responsiveness with PT students.

There is some evidence to suggest that certain demographic variables may predict cultural competence. Differences in cultural competence may exist between white and non-white subjects. Wilbur<sup>13</sup> studied nurse practitioner students and compared IAPCC-R© scores of White, African American, and other race (Asian, Native Hawaiian, Other Pacific Islander) students. Although the post-hoc Scheffe analysis failed to find significant differences among groups, the significant global ANOVA suggests that further examination of race as a predictor of cultural competence is justified. Fitzgerald et al<sup>14</sup> documented a significant difference in IAPCC-SV©

scores between white and non-white nursing students, albeit with a small non-white sample size. While the available data on race as a predictor of cultural competence are limited, the existing data support the need for further investigation into race as a predictor of IAPCC-SV© score.

Several variables other than race have been studied to examine their relationship with cultural competence. Sargent et al<sup>15</sup> studied the cultural competence of nursing students and faculty at a large public Midwestern state university. In particular, this investigation examined the relationship between number of countries participants had visited and the IAPCC© score. Sargent et al identified a significant correlation between number of countries visited and the IAPCC© score ( $r=.33$ ;  $p<.001$ ). While this is only a fair<sup>16</sup> relationship, it does provide preliminary evidence to support further investigation into the number of countries visited as a predictor of cultural competence.

Kawashima<sup>17</sup> studied the cultural competence of Japanese nurses as measured by the IAPCC-R©. A total of 16 different demographic/personal variables were examined for their relationship to cultural competence and several of these variables demonstrated significant findings. There were significant differences in IAPCC-R© scores among groups according to their ability to speak a foreign language. This variable accounted for 4.3% of the variance in the IAPCC-R© score, providing preliminary evidence to support further investigation into the ability to speak a foreign language as a predictor of cultural competence.

There were also significant differences in IAPCC-R© scores among groups according to their previous coursework in cultural diversity.<sup>17,18</sup> Japanese nurses who had taken courses related to cultural nursing care had significantly higher IAPCC-R© scores than nurses who had not taken courses related to cultural nursing care ( $p<.001$ ).<sup>17</sup> This variable accounted for 2.0% of the variance in IAPCC-R© score. Findley<sup>18</sup> also studied the relationship between the number of cultural diversity courses taken and IAPCC-R© score, and obtained similar results. There was a significant difference in IAPCC-R© scores among groups that completed 1, 2, 3, 4, 5, and >5

cultural diversity courses ( $p=.01$ ). However, follow up testing was not reported to determine which among the 6 groups differed from each other. These 2 studies<sup>17,18</sup> support further investigation into previous coursework in cultural diversity as a predictor of cultural competence.

The Kawashima<sup>17</sup> study also documented significant differences in IAPCC-R© scores among groups with experience in caring for culturally/ethnically diverse patients. Nurses who had experience in caring for culturally/ethnically diverse patients had significantly higher IAPCC-R© scores when compared to those who did not have this experience ( $p<.001$ ). This variable accounted for 2.4% of the variance in IAPCC-R© score. Findley<sup>18</sup> reported results that are consistent with Kawashima's findings. Findley asked nurses, "How often do you care for patients whose cultural background is different from your own?"<sup>18</sup> Response choices included: "rarely, occasionally, usually, and almost always."<sup>18</sup> The global ANOVA indicated a significant difference in IAPCC-R© scores among the groups ( $p=.001$ ) however, no additional testing was reported to determine which groups differed in IAPCC-R© scores. These 2 studies<sup>17,18</sup> provide preliminary evidence to support further investigation into experience in caring for culturally/ethnically diverse patients as a predictor of cultural competence.

## **OVERVIEW OF THE STUDY**

This methodological study incorporated both descriptive and double-blind experimental pre-test/post-test research designs. The IAPCC-SV©'s construct validity and the demographic predictors were examined for PT students in the first semester of their PT education. The IAPCC-SV©'s responsiveness was examined by comparing the IAPCC-SV© post-test scores of students who participated in a cultural competence learning module (experimental group) to those who participated in a professional behaviors learning module (control group). Both modules were designed with the same testing procedure (pre-test/post-test) and module delivery format, with the only difference being the content of the modules. This design minimized the possibility that



the obtained results were due to differences in testing procedure or module format. Documenting the IAPCC-SV©'s properties assisted in determining if it is an appropriate instrument to measure the cultural competence of PT students.

## **PURPOSE AND HYPOTHESIS**

This dissertation is comprised of 3 studies. Therefore, there were 3 purposes:

- I. to establish the construct validity (via factor analysis) of the IAPCC-SV©
- II. to determine the responsiveness of the IAPCC-SV©
- III. to investigate demographic predictor variables of the IAPCC-SV©

It was hypothesized that:

- I. the variables would load on only 1 component, with each component being represented by a number of strongly loaded variables
- II. the IAPCC-SV© would demonstrate responsiveness, evidenced by significantly higher post-module IAPCC-SV© scores of the experimental group when compared to the control group
- III. the cultural composite score would predict IAPCC-SV© score, and majority/minority status, over and above cultural composite score, would predict IAPCC-SV© score

## **PARTICIPANTS**

First semester PT students (n=303) from Texas universities were recruited to participate in the study. All students were recruited to participate in Study I (construct validity) and Study III (demographic predictors). Of the 303 students, 40 students from Texas State University–San Marcos (Texas State) were recruited to participate in Study II (responsiveness). The 303 students were recruited because they possessed a variety of cultural exposures and experiences and represented a variety of racial/ethnic backgrounds, ages, and both male/female genders.

*Inclusion criteria:* *Studies I and III.* First semester PT students from Texas PT education programs

were eligible to participate in the study. *Study II.* First semester PT students, Class of 2014, at Texas State were eligible to participate in the study. Exclusion criteria: *Studies I, II and III.* Students previously enrolled in a PT education program were excluded from this study.

## **INSTRUMENTATION**

### **IAPCC-SV© (Studies I, II, III)**

The IAPCC-SV© is a 20-item, self-assessment tool that requires approximately 10-15 minutes to complete.<sup>3</sup> The IAPCC-SV© utilizes a 4-point Likert scale with the following response choices, "strongly agree, agree, disagree, and strongly disagree."<sup>3</sup> One item is reverse coded. The following number of items assess each cultural construct: awareness: 3, knowledge: 5, skill: 3, encounters: 5, and desire: 4. Total scores range from 20 to 80 and a student's score reflects the cultural competence level at which the student is operating: culturally incompetent (20-40 points), culturally aware (41-59 points), culturally competent (60-74 points), and culturally proficient (75-80 points). Okere et al<sup>9</sup> demonstrated the IAPCC-SV©'s internal consistency (Cronbach's alpha= .75) and the test-retest reliability (ICC(2,1)=.87) with PT students. This copyrighted instrument can be obtained by contacting Dr. Campinha-Bacote.<sup>19</sup>

### **Demographic Survey (Studies I, II, III)**

The demographic survey (Appendix A) consists of 10 total items. The first 3 items relate to age, gender, and race. Five of the remaining 7 items relate to cultural experiences that were selected based upon the current literature.<sup>15,17,18</sup> Two items were original items. Response choices vary by question; however each item has a 5-point response scale, with values ranging from 0-4. These 7 items comprise the cultural composite score, whose total scores could range from 0-28. This tool was constructed by the principal investigator (PI), based upon the current literature, to assess its ability to predict the IAPCC-SV© score.<sup>15,17,18</sup>

### **Professional Behaviors Assessment Tool (PBAT) (Study II)**

The Professional Behaviors Assessment Tool<sup>20</sup> (Appendix B) consists of 10 questions that ask students to rate themselves on their professional behaviors in the physical therapy setting. This is a commonly used instrument to assist students with development of professional behaviors. The original instrument was modified for the purposes of this study. Modifications included removal of the post entry level category and short answer sections including examples of professional behaviors/ideas for improvement. A 7-point scale was also added to assign values to the different levels of professional behaviors. The sole purpose of this survey was to strengthen the study's design by serving as an instrument that paralleled the IAPCC-SV©. The experimental (cultural competence) and control (professional behaviors) groups completed both instruments prior to and upon completion of their respective modules. This design minimized the students' awareness of their group assignment (experimental vs. control) as both groups completed one survey directly related to their module's content, and one survey that was not directly related to their module's content. Therefore, the only difference between the control and experimental groups was the content of the module not the testing procedures. The PBAT results were not analyzed in this study.

### **PROCEDURE**

This study was approved by the Texas Woman's University and Texas State University-San Marcos Institutional Review Boards (Appendix C). Permission to use the IAPCC-SV© was obtained (Appendix D).

### **Study I and III: IAPCC-SV© Construct Validity and Demographic Predictors**

During the first week of the PT education program, prior to the delivery of any culturally related coursework, the principal investigator (PI) obtain informed consent and read a standard



set of instructions to all participants (Appendix E). Participants then completed the demographic survey and IAPCC-SV©. The PI collected the demographic survey and IAPCC-SV©.

### **Study II: IAPCC-SV© Responsiveness**

Texas State PT students were recruited during the first week of the PT education program, prior to the delivery of any culturally related coursework. Following informed consent (Appendix F) procedures, students were randomly assigned a code number to use as the identifier on the surveys, rather than their name. They were also randomly assigned a group number to indicate which module they were to attend. Both the students and the PI were blinded to the group number assignment. The students completed the demographic survey, IAPCC-SV© (Time I) and PBAT (Time I). Two days following the Time I data collection, the PT students participated in a cultural competence learning module (Group 1, experimental) or a professional behaviors learning module (Group 2, control). Group 1 (experimental) students participated in a cultural competence learning module based on the Campinha-Bacote model.<sup>3</sup> It included both lecture instruction and group discussion of patient case studies. Simultaneously, Group 2 (control) students participated in a professional behaviors learning module. This module also included both lecture instruction and group discussion of patient cases. Each module was delivered in one four-hour session. Two scheduled 15 minute breaks were coordinated so that they occurred at different times for each group to minimize dissemination of module information. Upon completion of the respective modules, all students were instructed not to discuss the module content and all students re-convened in one classroom. The PI, blinded to group assignment, administered the IAPCC-SV© (Time 2) and the PBAT (Time 2) to all students. Both instruments were administered to minimize the students' awareness of their group assignment (experimental vs. control) as both groups were completing one survey directly related to their module's content, and one survey that was not directly related to their module's content. In

summary, the only difference between the control and experimental groups was the content of the module, and not the testing procedures or module format.

### **Data Reduction (Studies I, II and III)**

From the demographics survey, age was recorded in years and gender was recorded as 'male' and 'female'. These data were used to describe the subject population and were not used in any data analysis. Participants who did not answer the age or gender questions were removed from the analysis (Studies I, II, and III).

The data related to race were coded as 'majority', 'minority', or 'unknown'. Responses were coded as 'majority' if 'White (not Hispanic)' was indicated as the only descriptor of race. Responses were coded as 'minority' for several conditions. If any of the following descriptors was indicated, responses were coded as 'minority': African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or Other Pacific Islander and Other. If any combination of the following descriptors was indicated, responses were coded as 'minority': 'White (not Hispanic)', African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, and Other. If 'unknown' and any of the following descriptors was indicated, responses were coded as 'minority': African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, and Other. Surveys with race solely indicated as 'unknown' were coded as 'unknown' and removed from the demographic predictor analysis (Study III). Data from participants who did not provide a response to the question about their race were removed from the analysis (Studies I, II, and III).

The responses to demographics survey questions #4-10 were converted to a 0-4 point scale, and then the cultural composite score was calculated by summing the points for questions #4-10. Data from participants who did not answer every question for questions #4-10 were

removed from the demographic predictor analysis (Study III). All coded demographic data were entered into IBM® SPSS® Statistics 19 (SPSS).<sup>21</sup>

The IAPCC-SV© was scored manually by the PI according to the scoring key. Each student's score for each question was recorded in SPSS.<sup>21</sup> The IAPCC-SV© score was removed from the data analysis if one or more of the test items was incomplete. Texas State participants who did not complete all questions of the IAPCC-SV© on both occasions were removed from the Study II (responsiveness) analysis. The PBAT was not scored, as the instrument's purpose was to improve study design by minimizing the students' awareness of group assignment.

### **Data Analysis**

Study I. The IAPCC-SV© data were analyzed using a factor analysis to assess construct validity, and included screening, factor extraction, factor rotation, and interpretation.

Study II. An analysis of covariance was used to compare the IAPCC-SV© scores between the cultural competence and professional behaviors groups at Time 2 (post-test), using the Time 1 (pre-test) scores as the covariate.

Study III. Regression analysis was utilized to determine if cultural composite score predicted IAPCC-SV© score and if majority/minority status, over and above cultural composite score, predicted IAPCC-SV© score. All data analyses were performed using SPSS.<sup>21</sup> The alpha level was .05 for all tests of significance.

## CHAPTER II

### REVIEW OF LITERATURE

There is a clear disparity between the general population demographics in Texas and the demographics of practicing physical therapists in Texas. In 2012, the population of Texas was estimated as 43.5% Anglo, 40.2% Hispanic, and 11.5% Black.<sup>4</sup> These general population demographics are the best available estimate of Texas' patient population demographics. According to Jennifer Jones, Executive Assistant, Executive Council of Physical Therapy and Occupational Therapy Examiners for the State of Texas (written communication, January 2012), the 2012 Texas physical therapist demographics were 73.9% Caucasian or White (not of Hispanic Origin), 6.9% Hispanic, and 3.6% African American (not Hispanic). These marked racial/ethnic disparities between the patient and physical therapist population suggest that therapists in the state of Texas will be caring for patients of a different culture. Therefore, physical therapists must possess cultural competence to maximize the quality of care delivered to their clients.

The Commission for Accreditation in Physical Therapy Education (CAPTE) expects that physical therapists provide care with respect for cultural differences. The CAPTE standards require that students are prepared to, "Identify, respect, and act with consideration for patients'/clients' differences, values, preferences, and expressed needs in all professional activities."<sup>1</sup> Furthermore, cultural competence is incorporated into more than 9 additional CAPTE criteria with which physical therapist education programs must demonstrate compliance. Therefore, physical therapist education programs are required to prepare students to care for patients in a culturally competent manner.



The American Physical Therapy Association (APTA) recognizes the need for physical therapists to possess cultural competence and has taken several steps to address the issue. The APTA's Vision Statement for Physical Therapy 2020 states, "They [physical therapists] will provide culturally sensitive care distinguished by trust, respect, and an appreciation for individual differences."<sup>5</sup> The APTA also recognizes the need for cultural competence through its development of *A Normative Model of Physical Therapist Professional Education: Version 2004*.<sup>22</sup> This model defines professional practice expectations and educational outcomes for graduates of physical therapist programs. The APTA not only has addressed cultural issues in several of its documents, but also has created several committees to facilitate the incorporation of cultural competence into PT education and practice.

The Task Force to Develop a Cultural Competence Curriculum (Task Force) and the Committee on Cultural Competence (Committee) are "...comprised of expert physical therapist clinicians and educators who are experienced in providing culturally competent care and who understand the importance of healthcare providers being culturally competent as a strategy for eliminating health disparities that currently exist."<sup>2</sup> The Committee on Cultural Competence has released a *Blueprint for Teaching Cultural Competence in Physical Therapy Education (Blueprint)* to assist physical therapist education programs with incorporating cultural competence education into their curricula.<sup>2</sup> The *Blueprint* states, "It is a belief that culturally competent healthcare practitioners can, in fact, impact the trend of growing health disparities and, potentially, reduce or eliminate health disparities."<sup>2</sup> Therefore, the current strategy is to improve the cultural competence of physical therapists in order to decrease health disparities.

In an effort to guide physical therapist education programs on how to improve cultural competence of physical therapists, the Campinha-Bacote model<sup>3</sup> of cultural competence has been adopted by the Committee and Task Force. The *Blueprint*<sup>2</sup> states:



When educating physical therapists and physical therapist assistants towards developing cultural competence and cultural proficiency, the task force and the committee propose a holistic model that challenges the physical therapy practitioner to desire being culturally competent and engage in the process of self-awareness, knowledge building, skill development that results in cultural encounters that are positive and affirming to patients, families, friends, and colleagues, and enhance the diverse society in which work and personal life occur.

Since the Campinha-Bacote model<sup>3</sup> was adopted by the Committee and Task Force, a more comprehensive understanding of this model is warranted.

The Campinha-Bacote model is based upon the 5 constructs of cultural awareness, knowledge, skill, encounters, and desire.<sup>3</sup> *Cultural awareness* is defined as “the deliberate, self-examination and in-depth exploration of our personal biases, stereotypes, prejudices and assumptions that we hold about individuals who are different from us.”<sup>3</sup> It is the process through which healthcare providers become aware of their patient’s cultural values and belief systems.<sup>6</sup> Integral to this construct is the realization that “just becoming aware of one’s prejudices and biases toward other cultures does not ensure the development of culturally responsive interventions”.<sup>6</sup>

*Cultural knowledge* is the “process of seeking and obtaining a sound educational base about culturally diverse groups.”<sup>3</sup> The desired outcome of the cultural knowledge is twofold. First, the healthcare professional should strive to gain an understanding of a patient’s world view, and its influence on the patient’s behavior, as this has the potential to influence their healthcare experience.<sup>6</sup> The second objective is for the healthcare practitioner to gain “knowledge regarding specific physical, biological, and physiological variations among ethnic groups.”<sup>6</sup> Therefore, the cultural knowledge construct incorporates knowledge about differences in world views as well as differences in physical/physiological characteristics among cultures.<sup>6</sup>

*Cultural skill* is the healthcare provider’s “ability to collect relevant cultural data regarding the client’s presenting problem, as well as accurately performing a culturally based, physical assessment in a culturally sensitive manner.”<sup>3</sup> It incorporates 2 distinct, but related processes:

how to perform a *cultural* assessment of a patient, as well as how to complete a culturally based *physical* assessment.<sup>3</sup> Cultural skill essentially involves the appropriate application of cultural knowledge, as it relates to the healthcare environment. Cultural skill involves the healthcare provider's ability to take the knowledge obtained about a patient's world view and, "gather information about the client's perceptions of the presenting problems as well as possible treatment modalities."<sup>6</sup> That is, understanding how a patient's world view may influence the evaluation and treatment of a patient, which in turn may affect the patient's outcome.<sup>6</sup> Cultural skill also includes the application of the cultural knowledge about physical, biological, and physiological variations among different cultural groups.<sup>6</sup> According to Campinha-Bacote, "Healthcare providers should know how clients' physical, biological, and physiological variations influence the ability to conduct an accurate and appropriate physical evaluation."<sup>6</sup> That is, understanding how physical/biological differences among cultural groups may also influence evaluation and treatment of a patient, as well as the patient's outcome.<sup>6</sup> In summary, the cultural skill construct addresses the appropriate *application* of cultural knowledge about world view and physical/biological differences as they relate to the healthcare environment.<sup>6</sup>

*Cultural encounter* is the "act of directly interacting with clients from culturally diverse backgrounds."<sup>3</sup> The cultural encounter construct emphasizes the need for healthcare professionals to interact with many patients from many diverse cultural backgrounds "to refine or modify one's existing beliefs regarding a cultural group."<sup>6</sup> Cultural encounter is critical because of intra-ethnic variation, which is the phenomenon that "there is more variation within a cultural group than across cultural groups."<sup>6</sup> Since intra-ethnic variation exists, it is essential that healthcare providers interact with numerous persons of a cultural group.<sup>6</sup> Only then will healthcare providers obtain a true appreciation for the diversity within a cultural group.<sup>6</sup>

Finally, *cultural desire* construct is the "motivation of the healthcare professional to 'want to' engage in the process of becoming culturally competent; not the 'have to'."<sup>3</sup> Campinha-Bacote

suggests that “Although healthcare providers may possess cultural awareness, cultural knowledge, and cultural skill, and may have had several cultural encounters, they also must possess the genuine desire and motivation to work with culturally different clients.”<sup>6</sup> Cultural desire is considered to be the critical construct as it is the foundation for cultural competence.<sup>3</sup> In summary, the Campinha Bacote model emphasizes the interdependence of the constructs, and the need for healthcare professionals to experience/address each construct.<sup>6</sup>

Campinha-Bacote also identifies several assumptions of the model.<sup>3</sup> One assumption is that cultural competence is an ongoing process as opposed to a one-time event.<sup>3</sup> The model also assumes that this process consists of the 5 previously identified constructs and that cultural desire is the “spiritual and pivotal construct of cultural competence.”<sup>3</sup> The model assumes that “Cultural competence is an essential component in rendering effective and culturally responsive care to all clients.”<sup>3</sup> Finally, the model assumes the existence of intra-cultural variation and that “All encounters are cultural and sacred encounters.”<sup>3</sup>

In addition to proposing a model of cultural competence, Campinha-Bacote<sup>6</sup> proposed an instrument to measure cultural competence, the “Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals (IAPCC®).” This instrument is based upon her model of cultural competence and is designed to measure the level of cultural competence among healthcare professionals.<sup>6</sup> The original instrument was later revised, resulting in the “Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals - Revised (IAPCC-R®).”<sup>3</sup> The IAPCC-R® is designed for use with various healthcare clinicians, educators, and students, including physical therapists and physical therapist students.<sup>3</sup>

The IAPCC-R® is a 25-item self-assessment tool that measures a healthcare professional's level of cultural competence.<sup>3</sup> The 25 items consist of 5 items from each of the 5 cultural constructs of awareness, knowledge, skill, encounters, and desire. Each item is scored using a 4-point Likert scale including the response categories of “strongly agree, agree, disagree,



strongly disagree; very aware, aware, somewhat aware, not aware; very knowledgeable, knowledgeable, somewhat knowledgeable, not knowledgeable; very comfortable, comfortable, somewhat comfortable, not comfortable; and very involved, involved, somewhat involved, not involved.”<sup>3</sup> The IAPCC-R© takes approximately 10-15 minutes to complete, and overall scores can range from 25-100 points. A healthcare professional’s score reflects the level of cultural competency at which the healthcare professional is operating. The 4 levels of cultural competency, from lowest to highest, are culturally incompetent, culturally aware, culturally competent, and culturally proficient. Higher overall scores reflect higher levels of cultural competence.

The psychometric properties, including validity and reliability, of the IAPCC-R© have been evaluated in numerous studies by various healthcare professionals.<sup>7,8,13,15,17,23-25</sup> More specifically, the face,<sup>25</sup> construct,<sup>7,8</sup> and content<sup>25</sup> validity and the internal consistency reliability<sup>8,13,15,17,23,24</sup> have been examined. According to Campinha-Bacote, face validity was established by “reviews of national experts in the field of transcultural healthcare.”<sup>25</sup> Construct validity is supported as the IAPCC-R© is based upon the 5 constructs (cultural awareness, knowledge, skill, encounters, and desire) of the Campinha-Bacote model.<sup>3</sup> Preliminary support for the construct validity of the IAPCC-R© has been established.<sup>7,8</sup> Brathwaite<sup>8</sup> studied 76 registered nurses who completed the IAPCC-R© prior to and upon completion of a cultural competence course that was based upon the constructs of the Campinha-Bacote model.<sup>3</sup> There was a statistically significant increase in scores upon completion of the cultural competence course, supporting the construct validity of the IAPCC-R©. Capell et al<sup>7</sup> also examined construct validity by comparing the construct of ethnocentrism to cultural competence. Capell et al noted several authors who suggest that a healthcare provider’s ability to provide culturally competent care can be negatively impacted by ethnocentrism. Capell et al documented an inverse relationship between cultural competence as measured by the IAPCC-R© and ethnocentrism as measured by

the Generalized Ethnocentrism Scale (GENE). The inverse relationship between the IAPCC-R© and the GENE lends support to the construct validity of the IAPCC-R©.<sup>25</sup>

According to Campinha-Bacote, the IAPCC-R© also demonstrates content validity as "the items clearly reflect the review of the literature of cultural competence in healthcare delivery that identifies awareness/attitudes, skill and knowledge as domains of cultural competence."<sup>25</sup> In addition, the content validity of the IAPCC-R© was established by experts in the field of transcultural healthcare at Northwest University, however, the results of this study remained unpublished at the time the current study was conducted.<sup>25</sup>

In addition to the face, construct, and content validity, the reliability of the IAPCC-R© has been examined in a variety of populations through several studies.<sup>8,13,15,17,23,24</sup> Koempel<sup>23</sup> evaluated the reliability of the IAPCC-R© in a sample of 275 certified nurse practitioners, and documented a Chronbach's alpha coefficient of .85 and a Guttman split-half coefficient of .83. Brathwaite<sup>8</sup> utilized a repeated measures design to study the cultural competence of 76 public health nurses and documented Cronbach's alpha range from .75-.93. Sargent et al<sup>15</sup> studied 260 nursing students and faculty members and documented Cronbach's alpha of .76. Wilbur<sup>13</sup> studied 185 nurse practitioner students and documented Cronbach's alpha of .80. Given these results, there is support for the internal consistency reliability of the IAPCC-R© in the field of nursing.

While multiple investigators have reported the reliability of the IAPCC-R© in the field of nursing, the information in the field of physical therapy is more limited. Gulas<sup>24</sup> administered the IAPCC-R© to 214 students in the Maryville University Physical Therapy Program, to examine the internal consistency reliability of the instrument for physical therapist students. In this study, the Chronbach's alpha was .78, the Guttman split half coefficient was .77, and the Spearman-Brown coefficient was .77.<sup>24</sup> These results reflect acceptable to good reliability of the IAPCC-R© when used with physical therapist students.<sup>26</sup>

In 2007, Campinha-Bacote<sup>3</sup> modified the instrument for use with student healthcare professionals, resulting in the "Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV®)." This instrument still measures the 5 constructs of the Campinha-Bacote model<sup>3</sup>, however, several of the questions from the IAPCC-R® have been removed, resulting in a total of 20 questions. Similar to the IAPCC-R®, the IAPCC-SV® utilizes a 4-point Likert scale, and requires approximately 10-15 minutes to complete. The responses of the IAPCC-SV® have been modified to only include the choices "strongly agree, agree, disagree, and strongly disagree."<sup>3</sup> Likewise, modifications to several of the questions were made. A student's score reflects the level of cultural competence at which the student is operating, and higher overall scores reflect higher levels of cultural competence. Scores for each question range from 1-4 points, and total scores can range from 20-80 points. The levels of cultural competence include culturally incompetent (20-40 points), culturally aware (41-59 points), culturally competent (60-74) and culturally proficient (75-80). The construct and content validity of the IAPCC-SV® cannot be assumed from the IAPCC-R® studies. However, since the IAPCC-SV® is largely based upon the IAPCC-R®'s constructs and content, it is reasonable to suggest that there is some basis for preliminary support for the IAPCC-SV®'s construct and content validity. To date, the principal investigator did not identify any published studies that have utilized a factor analysis with student PTs to examine the construct validity of the IAPCC-SV®. Therefore, additional studies specifically utilizing the IAPCC-SV® are necessary to examine the construct validity of the instrument. The internal consistency of the IAPCC-SV® has been reported by Fitzgerald et al.<sup>14</sup> In this study, the internal consistency as measured by Chronbach's alpha was .78 in a sample of 90 undergraduate nursing students.

In 2010, Okere et al<sup>9</sup> conducted a pilot study and established the IAPCC-SV®'s internal consistency (Cronbach's alpha=.75) and test re-test reliability (ICC(2,1)=.87) with student physical therapists. In this study, after students completed the instrument twice (test/re-test) they



participated in a cultural competence learning module based upon the Campinha-Bacote model.<sup>3</sup> Upon completion of the module, the students completed a global rating to assess their perceived magnitude of change in cultural competence following participation in the learning module. Post hoc power analysis demonstrated power  $>.99$ . There was a large effect size of the intervention ( $d=.98$ ). The pilot study demonstrated that convergent validity was supported by moderate and significant correlations between IAPCC-SV© difference scores and magnitude of change global rating scores ( $r=.507$ ;  $p<.01$ ). The minimal clinically important difference was also determined to be 4.6 points in this pilot study. One limitation of this study was that all students participated in the module – there was no control group. Therefore, the responsiveness of the IAPCC-SV© could not be established. Another limitation of this study was that no demographic information was collected. Therefore, no demographic variables could be examined for their ability to predict the students' cultural competence as measured by the IAPCC-SV© total score. In summary, before the IAPCC-SV© is widely used with the student physical therapist population, the following IAPCC-SV© properties need to be examined: construct validity via factor analysis, responsiveness of the instrument, and demographic variables that may predict the IAPCC-SV© total score.

While no studies have examined the construct validity of the IAPCC-SV© via factor analysis with PT students, 2 studies<sup>10,11</sup> have examined the construct validity of the IAPCC-R© via factor analysis. Both of these studies were performed outside of the United States. Olt et al<sup>10</sup> performed a factor analysis on a translated and adapted Swedish version of the IAPCC-R©, with 334 nursing students and registered nurses. Confirmatory factor analysis did not confirm the instrument's proposed factor structure. Subsequently, an exploratory factor analysis was performed to investigate the factor structure. The Olt et al<sup>10</sup> study identified a total of 8 factors which is not consistent with the 5-factor structure proposed by Campinha-Bacote.<sup>3</sup> In addition these 8 factors accounted for less than 50% of the variance, and were difficult to interpret.<sup>10</sup>

However, since there is limited published information regarding the internal structure of the English version of the IAPCC-R©, Olt et al<sup>10</sup> could not determine if the results were due to the Swedish translation and adaptation, or the construction of the instrument's English version.

Ho and Lee<sup>11</sup> also performed an exploratory factor analysis using the IAPCC-R©. In this study, the IAPCC-R© was administered to 237 Taiwanese medical students. Based upon the results of their study, Ho and Lee<sup>11</sup> concluded that there was no "identifiable factor structure" for the IAPCC-R© when utilized with Taiwanese medical students. They also examined the internal consistency of the original 5 proposed subscales. The Cronbach's alpha values ranged from .06 to .57 for the proposed subscales. The Ho and Lee study did not support the proposed 5-factor structure, nor does it support the internal consistency of the subscales. The results of this study must be interpreted cautiously; however, as the results obtained with Taiwanese medical students may not apply to a population of United States student healthcare professionals.

The results of these two factor analysis studies<sup>10,11</sup> should be interpreted with caution because neither study utilized student physical therapists, and because both studies were performed internationally. It should also be reiterated that these studies utilized the IAPCC-R©, not the IAPCC-SV©. It is necessary to perform a factor analysis on the English version of the IAPCC-SV© in the United States with student physical therapists in order to determine if the IAPCC-SV© is an appropriate instrument to use with student physical therapists.

The literature examining the responsiveness of the IAPCC-SV© is as limited as the literature examining its construct validity via factor analysis. Since the IAPCC-SV© is a relatively new instrument, its responsiveness has not been well documented. However, the responsiveness of the IAPCC-R© has been studied in several different student populations.<sup>12,27</sup> The responsiveness of the IAPCC-SV© cannot be assumed from the studies of the IAPCC-R©. However, since the IAPCC-SV© is largely based upon the IAPCC-R©, it is reasonable to suggest that there is some basis for preliminary support for the IAPCC-SV©'s responsiveness. Therefore,



a review of the literature addressing the responsiveness of the IAPCC-R© with student physical therapists is warranted.

Musolino et al<sup>27</sup> examined the effect of the Cultural Competency & Mutual Respect (CCMR) training on the cultural competence of Interdisciplinary Health Sciences Students. The sample included medicine, pharmacy, nursing, physical therapy, and occupational therapy students, and the study included results and data analysis by discipline. The physical therapist students included 36 first-year students and 36 third-year students. The 36 first-year students completed the IAPCC-R© (pre-test) and then participated in the 4 CCMR modules, with each module lasting 2 hours. Upon completion of the modules, the PT students completed the IAPCC-R© (post-test). The 36 third-year students did not participate in the CCMR training; however, they had 2 more years of experience (academic and clinical). These 36 third-year students completed the IAPCC-R© once, during the third and final year of their education, and served as the control group for the study. Musolino et al documented a significant increase in the cultural competence of the first-year student PTs as measured by the IAPCC-R© following participation in cultural competence education. This observation supports the instrument's responsiveness, as it documented a change in the students' cultural competence from pre-test to post-test. In addition, Musolino et al documented a difference in IAPCC-R© scores between third-year PT students who did not participate in the CCMR training (control group) and the first-year PT students who did participate in the training (experimental group). This observation also supports the responsiveness of the IAPCC-R© as it documented a difference in the cultural competence of students that did participate in the training (experimental group) and those that did not (control group).

Musolino et al<sup>12</sup> also conducted a 3 year investigation that examined the effect of the CCMR training on the cultural competence of Interdisciplinary Health Sciences students. Similar to the original Musolino et al<sup>27</sup> investigation, the study included results and data analysis by

discipline. The physical therapist students included 82 PT students who completed the IAPCC-R© (pre-test) and then participated in the 4 CCMR modules. Upon completion of the modules, the PT students completed the IAPCC-R© (post-test). The study also included a cohort of PT students who did not participate in the CCMR training and served as controls for the investigation. The IAPCC-R© scores of student physical therapists were significantly higher at post-test, following participation in a cultural competence learning module, when compared to pre-test.<sup>12</sup> This observation further supports the instrument's responsiveness, as it documented a change in the students' cultural competence from pre-test to post-test with a larger sample size. In addition, this study supports the reproducibility of results for the instrument's responsiveness. In this study, the IAPCC-R© scores of PT students who participated in a cultural competence learning module (experimental group) were significantly higher than IAPCC-R© scores of PT students that did not participate in a cultural competence learning module (control group).<sup>12</sup> This observation also supports the responsiveness of the IAPCC-R© as it documented a difference in the cultural competence of students that did participate in the training (experimental group) and those that did not (control group). The Musolino et al<sup>12,27</sup> studies provide preliminary support that the IAPCC-R© is responsive to differences in, and changes to, the cultural competence of student physical therapists. Additional research is necessary to document the responsiveness of the IAPCC-SV© to a cultural competence education intervention with student physical therapists.

In addition to the responsiveness of the IAPCC-SV©, other properties such as the predictors of IAPCC-SV© score should be investigated. Several studies<sup>13-15,17,18,28</sup> have examined variables that may predict the cultural competence of healthcare providers. As noted with the factor analysis and responsiveness literature, most of these studies have utilized the IAPCC© and IAPCC-R©, not the IAPCC-SV©, to examine these predictors. Some of the variables that may predict cultural competence include: race,<sup>13,14,28</sup> number of countries outside of the US

travelled to,<sup>15</sup> ability to speak another language,<sup>17</sup> courses in cultural diversity taken,<sup>17,18</sup> experiences treating culturally diverse patients,<sup>17,18</sup> and experience living abroad.<sup>15,17</sup>

Several investigators have examined the relationship between race and cultural competence.<sup>13,14,28</sup> There is some evidence to suggest that there may be differences in cultural competence between white and non-white subjects.<sup>13,14</sup> Wilbur<sup>13</sup> studied 185 nurse practitioner students and compared IAPCC-R© scores of White, African American, and other race (Asian, Native Hawaiian, Other Pacific Islander) students. The sample included 83.1% white, 13.1% black or African American, and 6% other race (Asian, Native Hawaiian, Other Pacific Islander) students. The global ANOVA revealed a difference in scores among the 3 groups, but the post-hoc Scheffe testing failed to find significant differences among groups.<sup>13</sup> Although the post-hoc testing failed to find significant differences among groups, the significant global ANOVA suggests that further examination of the relationship between race and cultural competence is justified. The characteristics of the sample should also be taken into account when interpreting this study. In this study, racial background and ethnicity were 2 separate questions. Racial background included the previously identified response choices. Ethnicity included response choices of either "Hispanic or not Hispanic/Latino."<sup>13</sup> In this sample, 95.4% of students were not Hispanic/Latino (n=165) while 4.6% (n=8) were Hispanic. In addition, 83.1% of the students identified themselves as white. The results of this study should be interpreted with caution as they may not be applicable to more diverse subject populations, and in particular populations with a higher percentage of Hispanic participants.

Riley<sup>28</sup> examined the difference in IAPCC-R© scores among racial groups for Nevada nursing students. The IAPCC-R© was administered to 53 nursing students during the first nursing course in the curriculum. The sample was 90.6% female (n=48) and 9.4% male (n=5). The sample was diverse as 7 racial groups were represented and only 60.4% (n=32) of the sample identified themselves as white. However, there was limited representation of Hispanic or Latino



students 5.7% (n=3). Riley combined 2 of the racial groups in the analysis and performed an analysis of variance. Riley did not identify any differences in IAPCC-R© among the groups. Additional analysis was performed by categorizing subjects as white or non-white and an independent samples t-test was performed. Again, there was no significant difference in IAPCC-R© scores between groups. Although this study does not support differences in IAPCC-R© scores among racial groups, the results of this study should be interpreted with caution. The total sample was small (n=53) which contributed to small numbers of subjects in each group for the analysis of variance. The sample also had limited representation of Hispanic or Latino students and the results of this study may not be applicable to populations with higher Hispanic representation. Another limitation of both the Wilbur<sup>13</sup> and Riley<sup>28</sup> studies is that they were performed with students using the IAPCC-R© and not the IAPCC-SV© which is specifically designed for use with students.

Fitzgerald et al<sup>14</sup> studied the cultural competence of nursing students at a private Midwestern university using the IAPCC-SV©. The undergraduate nursing students (n=90) who participated in this investigation were 85.6% (n=77) White, 2.2% (n=2) African American, 7.8% (n=7) Other and 4.4% (n=4) not reported. Fitzgerald et al documented a significant difference in IAPCC-SV© scores between white and non-white nursing students. Although a significant difference was documented, this result should still be interpreted with caution due to the small non-white sample size. In summary, the available data on race and its relationship with cultural competence is limited. The studies that have investigated this relationship have limitations due to the instruments utilized, sample size, or the sample characteristics. Although the relationship between race and cultural competence is not clear, the existing data do support the need for further investigation into relationship between race and IAPCC-SV© score.

Sargent et al<sup>15</sup> studied the cultural competence of 260 nursing students and faculty at a large Midwestern state university. The nursing students were first-year and fourth-year students.

In this study, the relationships between several demographic variables and IAPCC© scores were examined. There was a significant correlation between number of countries visited and IAPCC© score ( $r=.33$ ;  $p<.001$ ). While this is only a fair<sup>16</sup> relationship, it does provide preliminary evidence to support further investigation into the number of countries visited as a predictor of cultural competence. Although there was a significant relationship between number of countries visited and IAPCC© score, this study does have several notable limitations. The instrument utilized in this study was the original instrument, the IAPCC© not the IAPCC-SV©. Another limitation of this study was that only 51% of the students studied had ever visited a foreign country.<sup>15</sup> It is possible that the limited number of students that visited other countries may have influenced the results of this study. Another limitation was that the subject population was predominantly Caucasian females. Given the limitations of instrumentation, experience visiting another country, and sample characteristics, the results of this study must be interpreted with caution and may not be generalizable to other populations.

Several other variables have been investigated for their relationship with cultural competence. Kawashima<sup>17</sup> studied the cultural competence of 1035 Japanese nurses as measured by the IAPCC-R©. In this study, a total of 16 different demographic/personal variables were examined for their relationship to cultural competence. Of the 16 variables, several variables demonstrated significant findings. The ability to speak a foreign language was the first variable that demonstrated significant differences in IAPCC-R© scores among groups. Subjects were asked, "How well do you speak any foreign languages?"<sup>17</sup> Response choices included, "speak very well, speak fairly well, speak a little, and not speak".<sup>17</sup> Only 4 subjects indicated 'speak very well' and 4 indicated 'speak fairly well'. These 2 categories were combined for the purposes of the data analysis. Most subjects indicated 'not speak' ( $n=801$ ) while 225 subjects indicated 'speak a little'. Nurses who 'did not speak' a foreign language demonstrated significantly lower IAPCC-R© scores than nurses who 'spoke a little' of a foreign language ( $p<.001$ ). The ability to speak a

foreign language accounted for 4.3% of the variance in the IAPCC-R© score. The results of the Kawashima study provide preliminary evidence to support further investigation into the ability to speak a foreign language as a predictor of cultural competence. Although the amount of variance accounted for is low, it is reasonable to further investigate the ability to speak a foreign language as a predictor of cultural competence. The primary limitation of this aspect of the study is that only 8 out of 1034 subjects indicated that they spoke a foreign language 'very well' or 'fairly well'. With such a small number of subjects in that group, the results of the study may have been influenced by a lack of diversity in the subjects' ability to speak a foreign language. Therefore, the results of this study should not be generalized to populations with greater diversity in the ability to speak a foreign language. Future studies should examine this variable's ability to predict cultural competence in a sample with greater diversity in the ability to speak a foreign language.

Previous coursework in cultural diversity was another variable that demonstrated differences in IAPCC-R© scores among groups. In the Kawashima<sup>17</sup> study, nurses were asked if they had participated in cultural nursing care courses/workshops, with response choices "yes" or "no". There were 76 nurses that had participated and 958 nurses that had not. Nurses who had taken courses related to cultural nursing care had significantly higher IAPCC-R© scores than nurses who had not taken courses related to cultural nursing care ( $p < .001$ ). This variable accounted for 2.0% of the variance in the IAPCC-R©. Although that amount of variance accounted for by this variable is low, the study does provide preliminary evidence to support further investigation into previous coursework in cultural diversity as a predictor of cultural competence.

Findley<sup>18</sup> also studied the number of cultural diversity courses taken and its relationship to nurses' IAPCC-R© scores. Findley administered a demographic survey and the IAPCC-R© to 270 nurses. One of the demographic survey questions was, "How many courses specifically related to cultural diversity have you taken?"<sup>18</sup> Response choices included: "none, one, two,



three, four, five, and greater than five."<sup>18</sup> Findley documented a significant difference in IAPCC-R© scores among groups ( $p=.01$ ). However, follow up testing was not reported to determine which among the 6 groups differed from each other. The results of the Kawashima<sup>17</sup> and Findley<sup>18</sup> studies support the need for further investigation into this variable's ability to predict cultural competence.

The third variable in the Kawashima<sup>17</sup> study that demonstrated significant differences in IAPCC-R© scores among groups was experience caring for culturally/ethnically diverse patients. Nurses who had experience caring for culturally/ethnically diverse patients had significantly higher IAPCC-R© scores when compared to those who did not have this experience ( $p<.001$ ). Again, this factor only accounted for a small proportion (2.4%) of variance of the IAPCC-R© score. However, this study does provide preliminary evidence to support further investigation into experience in caring for culturally/ethnically diverse patients as a predictor of cultural competence.

Findley<sup>18</sup> reported results that are consistent with Kawashima's<sup>17</sup> findings. Findley investigated the cultural competence of nurses at the hospital bedside using the IAPCC-R©. Findley asked nurses "How often do you care for patients whose cultural background is different from your own?"<sup>18</sup> Response choices included: "rarely, occasionally, usually, and almost always."<sup>18</sup> The global ANOVA indicated a significant difference in IAPCC-R© scores among the groups ( $p=.001$ ). However, no additional testing was reported to determine which groups differed in IAPCC-R© scores. Although there is limited evidence, there appears to be enough evidence to warrant further investigation into the differences in IAPCC-R© scores among groups based upon experiences caring for patients from different cultural backgrounds

One of the variables that Kawashima<sup>17</sup> examined that did not demonstrate a significant difference between groups is experience living overseas. Kawashima compared IAPCC-R© scores of Japanese nurses that lived overseas for less than 1 year to those that lived overseas



for more than 1 year. There was no difference in IAPCC-R© scores between the groups ( $p=.60$ ), but there was 1 notable limitation to this aspect of the study. There were a total of 1035 participants in the Kawashima study, but only 20 of the participants (2%) had any overseas living experience. The lack of significant difference between the groups may be influenced by lack of variability of the data. Therefore, it is necessary to study subjects who have greater diversity in their experience living in another country, to determine if this is a predictor of cultural competence.

Sargent et al<sup>15</sup> also investigated the relationship between cultural competence and experience living in a foreign country. They studied 206 nursing students and faculty, and they did not identify a significant correlation between IAPCC© scores and experience living in a foreign country. Similar to the Kawashima<sup>17</sup> study, the Sargent et al<sup>15</sup> study had limited diversity in its sample. In the Sargent study, 93.2% of first-year students, 87.6% of fourth-year students, and 82.4% of faculty had not lived in a foreign country. The lack of diversity in this sample may have influenced the results of the study. Therefore, the results of this study should be interpreted with caution, and should not be generalized to populations with more diversity in experience living abroad. This variable should be further investigated for its ability to predict cultural competence.

The changing demographics of the US general population compel physical therapists to treat patients with cultural competence in order to minimize miscommunication and misdiagnosis, and to improve patient compliance and the quality of care delivered to patients. Therefore, physical therapist education programs must prepare students to treat patients with cultural competence. The *Blueprint for Teaching Cultural Competence in Physical Therapy Education*<sup>2</sup> has adopted the Campinha-Bacote model<sup>3</sup> as a framework for teaching cultural competence. In order for physical therapist education programs to determine if they are adequately preparing students to treat with cultural competence, reliable and valid outcome measures must be utilized to document physical therapist students' cultural competence. The IAPCC-SV©<sup>3</sup> is an outcome

measure that is consistent with the Campinha-Bacote model<sup>3</sup> adopted for the *Blueprint*.<sup>2</sup> There is preliminary evidence to suggest that this instrument has face, construct, and content validity, as well as internal consistency and test/re-test reliability.<sup>9,14,19</sup> Additional testing should be performed specifically with physical therapist students, to determine the psychometric properties of this instrument in this specific population. Once the psychometric properties of this instrument are documented and deemed to be acceptable in this population, this instrument could be used to determine if the current education programs are preparing students to treat with cultural competence. In addition, use of this instrument could provide evidence to support the use of one teaching method over another. Clearly there is a very well defined avenue for future research in cultural competence as it relates to physical therapist education.

## CHAPTER III

### METHODOLOGY

#### INTRODUCTION

This investigation's overall purpose was to examine the IAPCC-SV©'s construct validity, responsiveness, and selected demographic predictors. The investigation was comprised of 3 separate studies; therefore, there were 3 specific purposes:

Study I. establish the IAPCC-SV©'s construct validity (via factor analysis)

Study II. determine the IAPCC-SV©'s responsiveness

Study III. investigate selected demographic predictor variables of the IAPCC-SV©

It was hypothesized that:

Study I. the variables would load on only 1 component, with each component being represented by a number of strongly loaded variables

Study II. the IAPCC-SV© would demonstrate responsiveness, evidenced by the experimental group demonstrating significantly higher post-module IAPCC-SV© scores when compared to the control group

Study III. the cultural composite score would predict IAPCC-SV© score, and majority/minority status, over and above cultural composite score, would predict IAPCC-SV© score

#### RESEARCH DESIGN

This investigation incorporated methodological (Study I), double-blind experimental pre-test/post-test (Study II), and predictive correlational (Study III) research designs.

## **Sampling Method**

For Studies I and III, nonprobability, purposive sampling was utilized. The target population was student physical therapists attending Texas, post-baccalaureate, non-military education programs. Students attending programs that were not post-baccalaureate were purposefully excluded to establish a baseline educational level. Graduates of military based programs primarily treat the military population, not the civilian population. This investigation was interested in student physical therapists treating the civilian population; therefore, students attending military based physical therapist education programs were purposefully excluded. Institutions that met the purposive sampling criteria were recruited to participate at the Texas Consortium for Physical Therapy Clinical Education, Inc. Spring 2011 meeting. Academic Coordinators for Clinical Education (ACCE) and Directors of Clinical Education (DCE) were approached with the Recruitment Memo (Appendix G) to request participation in this investigation. All ACCEs/DCEs that expressed interest were subsequently contacted via email by the principal investigator (PI) to establish a date/time for data collection. The PI travelled to each participating institution to recruit students. The PI recruited students during the first semester of each institution's PT education program, prior to the delivery of any culturally related coursework. The PI met with the prospective student participants during an orientation session or at the beginning of a regularly scheduled class time. The PI explained the purpose and nature of the investigation, answered all questions, obtained informed consent and read a standard description of the study to all participants (Appendix E).

Study II utilized nonprobability, convenience sampling. First semester Texas State student physical therapists in the Class of 2014 were recruited to participate in this study. The PI met with the students during the first semester of their PT education program, during their program orientation. The PI explained the purpose and nature of the investigation, answered all questions and obtained informed consent (Appendix F).



The participants for Studies I, II, and III possessed a variety of cultural exposures and experiences and represented a variety of racial/ethnic backgrounds, ages, and both male/female genders.

### **Sample Inclusion/Exclusion Criteria**

*Inclusion criteria: Studies I and III.* First semester PT students from Texas, post-baccalaureate, non-military PT programs were eligible to participate in the study. *Study II.* First semester Texas State, Class of 2014, PT students were eligible to participate in the study.

*Exclusion criteria: Studies I, II and III.* Students with exposure to cultural content, due to previous enrollment in a PT education program, were excluded from this study.

### **Sample Size**

Sample size can influence statistical tests' ability to identify relationships and differences within data sets. For Study I, the ability to identify a factor structure can be influenced by the number of subjects participating in the factor analysis. According to Cattell<sup>29</sup> and Comrey and Lee,<sup>30</sup> the sample size for a factor analysis should include at least 100 to 300 subjects. Guadagnoli and Velicer<sup>31</sup> reviewed numerous studies and indicated that recommended sample sizes range from 2 subjects per variable up to 20 subjects per variable. The principal investigator determined a high subject to variable ratio to be appropriate; therefore, this study utilized a 15 subjects: 1 variable ratio. The IAPCC-SV© has 20 variables, resulting in a desired 300-subject participation sample size. To account for an estimated 10% attrition rate, a target recruitment sample size of at least 330 was established to allow for a 300 subject participation sample size. This sample size corresponds to the high end of Cattell<sup>29</sup> and Comrey and Lee's<sup>30</sup> recommended sample size and the principal investigator deemed it sufficient for Study I, as it complied with several different experts' recommendations.

Study II investigated the IAPCC-SV©'s responsiveness, and the sample size can influence the statistical tests' ability to identify a difference between groups if one exists. Type I error (alpha) is rejecting the null hypothesis when the null hypothesis is true.<sup>32</sup> To limit the probability of committing a Type I error, alpha was set at .05. Type II error (beta) is failing to reject the null hypothesis when the null hypothesis is false.<sup>32</sup> To limit the probability of committing a Type II error, beta was set at .2. Power is the ability to detect a difference when one exists and is equivalent to 1-beta.<sup>32</sup> A power of at least .80 was desired for this investigation. The results of the Okere et al<sup>9</sup> study were used to conduct an a priori power analysis for Study II. The study's intervention effect size was large ( $d=.98$ ) and the participation/retention rate was 98%. Given this effect size, a priori power analysis determined a 28 student total sample size would achieve power=.86, while a 40 student sample size would achieve a power=.92. The anticipated Texas State Class of 2014 enrollment was 40 students. Recruitment of those 40 subjects to retain 28 subjects was a very reasonable expectation based upon the pilot study's 98% retention rate. Recruitment of 40 subjects to retain 28 subjects allowed for a 30% attrition rate while still maintaining power of .86. Therefore, a recruitment sample size of 40 subjects was established for Study II.

Study III examined the relationship between two factors (cultural composite score, majority/minority status) and IAPCC-SV© score. The ability to identify a relationship if one exists between the factors and IAPCC-SV© score is influenced by the sample size. Gardner<sup>33</sup> reviewed several author's recommendations and noted a general guideline for the number of subjects per factor necessary to perform a regression analysis is 30 subjects per factor. This study had 3 factors (cultural composite score, minority/majority status, and IAPCC-SV© score) which yielded a desired participation sample of at least 90 subjects. Therefore, it was necessary to recruit at least a 100 subject sample to allow for a 10% attrition rate, in order to obtain the desired 90

subjects sample size. As the 30 subjects per factor recommendation is a very general guideline, more specific recommendations were also considered.

Correlations between predictor variables and outcome variables can be utilized to calculate effect size, which can then be used to estimate necessary sample size. However, the cultural composite score is a newly created predictor variable, therefore, no data exist to estimate a correlation between the cultural composite score and the IAPCC-SV©. Furthermore, the PI did not identify any published studies that have documented the correlation between the majority/minority status and IAPCC-SV© score. Since neither of these correlations was identified, the effect size could not be calculated, so it was estimated. The PI wanted to determine if a significant relationship exists between predictor and outcome variables, even in the presence of a small effect size. Therefore, a small<sup>16</sup> effect size was estimated ( $d=.04$ ). A small, conservative effect size estimate allowed the PI to calculate a sufficiently large sample size that would be necessary to identify if a significant relationship exists, even in the presence of a small effect size. G\*Power 3.1<sup>34</sup> software was used to estimate the sample size, with the effect size=.04, alpha=.05, power=.80, and 2 predictor variables (cultural composite and majority/minority status). A 244-subject participation sample size was determined to be necessary for Study III; therefore, it was necessary to recruit at least a 268-subject sample to allow for a 10% attrition rate, in order to obtain the desired 244-subject sample size. A 268-subject recruitment sample size was a more conservative estimate compared to the 90-subject recruitment sample, and was still realistic; therefore the 268-subject recruitment sample was established. Subjects who participated in Study I were also recruited for Study III. Since it was necessary to recruit 330 students for Study I, it was anticipated that more than the desired 268-subject sample size would be recruited for Study III.



## **Instrumentation**

**IAPCC-SV© (Studies I, II, III).** The IAPCC-SV©, a 20-item self-assessment tool, required approximately 10-15 minutes to complete.<sup>3</sup> The IAPCC-SV© utilized a 4-point Likert scale with individual item scores assigned with 1, 2, 3 or 4 points. The response choices included, "strongly agree, agree, disagree, and strongly disagree."<sup>3</sup> One item was reverse coded, meaning the assigned points for the response choices were the reverse of the instrument's other items. The instrument measured 5 constructs including cultural awareness, cultural knowledge, cultural skill, cultural encounters, and cultural desire. The following number of items assessed each cultural construct: awareness: 3, knowledge: 5, skill: 3, encounters: 5, and desire: 4. Total scores could range from 20 to 80 and a student's score reflected the cultural competence level at which the student was operating: culturally incompetent (20-40 points), culturally aware (41-59 points), culturally competent (60-74 points), and culturally proficient (75-80 points). Okere et al<sup>9</sup> demonstrated the IAPCC-SV©'s internal consistency (Cronbach's  $\alpha=.75$ ), and the test-retest reliability ( $ICC(2,1)=.87$ ) with PT students. These findings were consistent with those obtained with students in other health professions.<sup>19</sup> The IAPCC-SV©'s internal consistency values have ranged from .66 to .84 with health professions students.<sup>19</sup> This copyrighted instrument can be obtained by contacting Dr. Campinha-Bacote.<sup>19</sup>

**Demographic Survey (Studies I, II, III).** The demographic survey (Appendix A) consisted of 10 total items. The first 2 items (age, gender) were collected to describe the sample's characteristics. Age was an open-ended response item, while response choices for gender were male and female. Item 3 (race) was a variable collected to assess its ability to predict the IAPCC-SV© total score. Response choices for race included African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or other Pacific Islander, White (not Hispanic) Other, and Unknown. Items 4-10 related to cultural experiences.



These items were based upon the current literature and included questions about the number of countries visited,<sup>15</sup> number of cultural diversity courses taken,<sup>17,18</sup> ability to speak another language,<sup>17</sup> and experience living in another country.<sup>15,17</sup> In addition, questions about exposure to other cultures prior to and during undergraduate programs, as well as during physical therapy volunteer/work experience were included. Response choices varied by question; however, items 4-10 all had a 5-point response scale, with values ranging from 0-4. The scores for these 7 items were summed to create a cultural composite score, whose values could range from 0-28. The score was then assessed for its ability to predict the IAPCC-SV© total score.

**Professional Behaviors Assessment Tool (PBAT) (Study II).** The Professional Behaviors Assessment Tool<sup>20</sup> (Appendix B) consisted of 10 questions that asked students to rate themselves on their professional behaviors in the physical therapy setting. This is a commonly used instrument to assist students with development of professional behaviors. The original instrument was modified for the purposes of this study. Modifications included removal of the post entry level category and short answer sections including examples of professional behaviors/ideas for improvement. A 7-point scale was also added to assign values to the different levels of professional behaviors. The sole purpose of this survey was to strengthen the study's design by serving as an instrument that paralleled the IAPCC-SV© during the pre/post testing. Since the sole purpose of the PBAT was to improve the study design, it was not scored and the results were not analyzed in this study.

## **PROCEDURE**

### **Studies I and III: IAPCC-SV© Construct Validity and Demographic Predictors**

A change was made to the procedure described in the Recruitment Memo (Appendix G). Instead of mailing the instruments, the PI travelled to each participating institution to administer the instruments, to standardize the data collection procedure. The PI travelled to each institution

during the first few weeks of the first semester of each institution's PT education program, prior to students receiving any culturally related coursework. The PI met with the prospective participants during their orientation or at the beginning of a regularly scheduled class, explained the purpose and nature of the investigation, answered all questions, obtained informed consent, and read a standard set of instructions to all participants (Appendix E). The PI distributed the demographic survey and the IAPCC-SV© and participants' responses were anonymous. The PI collected the demographic survey and IAPCC-SV©.

### **Study II: IAPCC-SV© Responsiveness**

Texas State PT students in the Class of 2014 were recruited during their program orientation session, prior to the delivery of any culturally related coursework. Following informed consent procedures, the PI distributed sealed envelopes to the students that contained a randomly assigned code number to use as the identifier on the surveys, rather than their name. The sealed envelope also contained a randomly assigned group number to indicate which module they were to attend. Both the students and the PI were blinded to the group number assignment. The PI distributed the demographic survey, IAPCC-SV© (Time I) and PBAT (Time I) and the students completed the instruments. Two days following the Time I data collection, the PT students participated in a cultural competence learning module (Group 1, experimental) or a professional behaviors learning module (Group 2, control). Group 1 (experimental) students participated in a cultural competence learning module based on the Campinha-Bacote model.<sup>3</sup> It included both lecture instruction and group discussion of patient case studies. Simultaneously, Group 2 (control) students participated in a professional behaviors learning module. It also included both lecture instruction and group discussion of patient cases. Each module was delivered in one four-hour session. The PI did not provide instruction during the presentation of either module, as the instruction was provided by other Texas State faculty members. Breaks

were coordinated so that they occurred at different times for each group, to minimize dissemination of module information. Upon completion of the respective modules, all students reconvened in 1 classroom. The PI distributed another set of sealed envelopes containing the same subject number and group number assignments to the students. The PI, blinded to subjects and number and group assignment, administered the IAPCC-SV© (Time 2) and the PBAT (Time 2) to all students. Both instruments were administered to minimize the students' awareness of their group assignment (experimental vs control) as both groups completed 1 survey directly related to their module's content, and 1 survey that was not directly related to their module's content. In summary, the only differences between the control and experimental groups were the content of the module and the faculty member providing the content of each module, and not the testing procedures or module format. The PI collected the IAPCC-SV© and the PBAT.

#### **Scoring, Data Reduction, Treatment of Missing Data**

**Study I.** The demographics survey questions #1-3 were scored manually and coded in SPSS<sup>21</sup> as follows. Age (Question #1) was recorded in years, and gender (Question #2) was recorded as 'male' and 'female'. The data related to race (Question #3) were coded as 'majority', 'minority' or 'unknown'. Responses were coded as 'majority' if 'White (not Hispanic)' was indicated as the only descriptor of race. Responses were coded as 'minority' for several conditions. If any of the following descriptors was indicated, responses were coded as 'minority': African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or Other Pacific Islander and Other. If any combination of the following descriptors was indicated, responses were coded as 'minority': 'White (not Hispanic)', African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, and Other. If 'unknown' and any of the following descriptors was indicated, responses were coded as 'minority': African American, American Indian or Alaska Native, Asian, Hispanic/Latino, Native Hawaiian or



Other Pacific Islander, and Other. Surveys that did not have responses for demographic survey Q#1 - #3 were removed from the Study I analysis. For Study I, demographic questions #1 - #3 were solely used to describe the sample characteristics and were not used in any subsequent data analysis. The IAPCC-SV© was scored manually by the PI according to the scoring key. Each student's score for each question was recorded in SPSS.<sup>21</sup> The IAPCC-SV© was removed from the data analysis if 1 or more of the test items were incomplete.

**Study II.** The demographics survey questions #1-3 were scored as described in Study I. Surveys that did not have responses for demographic survey Q#1 - #3 were removed from the Study II analysis. For Study II, demographic questions #1 - #3 were solely used to describe the sample characteristics and were not used in any data analysis. The IAPCC-SV© was scored manually by the PI according to the scoring key. Each student's score for each question and the total IAPCC-SV© score was recorded in SPSS.<sup>21</sup> The IAPCC-SV© score was removed from the data analysis if 1 or more of the survey items were incomplete for Time I or Time II, or if the student did not attend the entire module. The PBAT was not scored, as the instrument's sole purpose was to improve study design by minimizing the students' awareness of group assignment.

**Study III.** The demographics survey questions #1-3 were scored as described in Study I. However, surveys with race solely indicated as 'unknown' were coded as 'unknown' and removed from the analysis. Questions #1 and #2 were solely used to describe the sample characteristics and were not used in any data analysis. The responses to demographics survey questions #4-10 were converted to a 0-4 point scale, and each student's score for each question was recorded in SPSS.<sup>21</sup> A cultural composite score was calculated by summing the points for questions #4-10 and the cultural composite score was recorded in SPSS.<sup>21</sup> Participants who did not answer every



question (Q#1-Q#10) on the demographic survey were removed from the analysis. The IAPCC-SV© was scored and recorded as described for Study II. The IAPCC-SV© was removed from the data analysis if 1 or more of the test items were incomplete.

**Studies I, II, III.** A graduate assistant independently scored all demographic and IAPCC-SV© surveys to confirm all scoring was performed correctly by the PI. The graduate assistant independently compared all raw data to the SPSS<sup>21</sup> spreadsheet to confirm that all data entry was performed correctly by the PI. All data scoring and entry discrepancies were identified and agreement was obtained between the PI and graduate assistant for all data scoring and entry.

### **Ethical Considerations**

**Human Subjects Protection.** This study was approved by the Texas State University-San Marcos and Texas Woman's University Institutional Review Boards (Appendix C). Participation in this study was voluntary and the PI explained the purpose and nature of the investigation to all prospective participants. All questions were answered prior to participation in the study and informed consent was obtained from all participants.

### **Privacy and Confidentiality**

**Studies I and III.** Participants were provided with a written copy of the instructions (Appendix E). The instructions were also read aloud. Students completed the surveys anonymously and had the right not to answer any questions they chose not to answer. All information was kept confidential. The PI, dissertation committee, and a graduate assistant were the only persons with access to the data.

**Study II.** The PI's dissertation advisor randomly assigned each student a code number and placed that code number in a sealed envelope with the student's name on the front. The PI obtained informed consent (Appendix F), then distributed the sealed envelopes to the students, but was blinded to the enclosed code number. The students used the code number as the identifier on the surveys, rather than their name. The PI's dissertation advisor was the only person that had access to the document linking the student to their code number. Participants had the right not to answer any questions they chose not to answer. All information was kept confidential. The PI, dissertation committee, and a graduate assistant were the only persons with access to the data.

### **Data Analysis**

Descriptive statistics including measures of central tendency, measures of dispersion, frequencies, and percentages were obtained, as appropriate, for the variables. All data analysis was performed using SPSS.<sup>21</sup> The alpha level was established at .05 for all tests of significance.

**Study I.** The data were screened for inaccurate data and assumptions of factor analysis. The IAPCC-SV© data was analyzed using a principal components exploratory factor analysis to assess construct validity and included factor extraction, factor rotation, and interpretation.

**Study II.** The data were screened for inaccurate data, assumptions for independent samples analysis of variance (ANOVA); and assumptions of covariates. An analysis of covariance (ANCOVA) was used to compare the IAPCC-SV© scores between the cultural competence and professional behaviors groups at Time 2 (post-test), using the Time 1 (pre-test) scores as the covariate.

**Study III.** The data were screened for inaccurate data, assumptions of regression, influence analysis, and collinearity. Regression analysis was performed to determine if the

cultural composite score predicted IAPCC-SV© score, and if majority/minority status, over and above cultural composite score, predicted IAPCC-SV©.

## CHAPTER IV

### RESULTS

This investigation's overall purpose was to examine the IAPCC-SV©'s construct validity (Study I), responsiveness (Study II), and selected demographic predictors (Study III). The results of this investigation are presented separately for Studies I, II, and III. For each study, subject management and description of subjects, data screening, and results are presented.

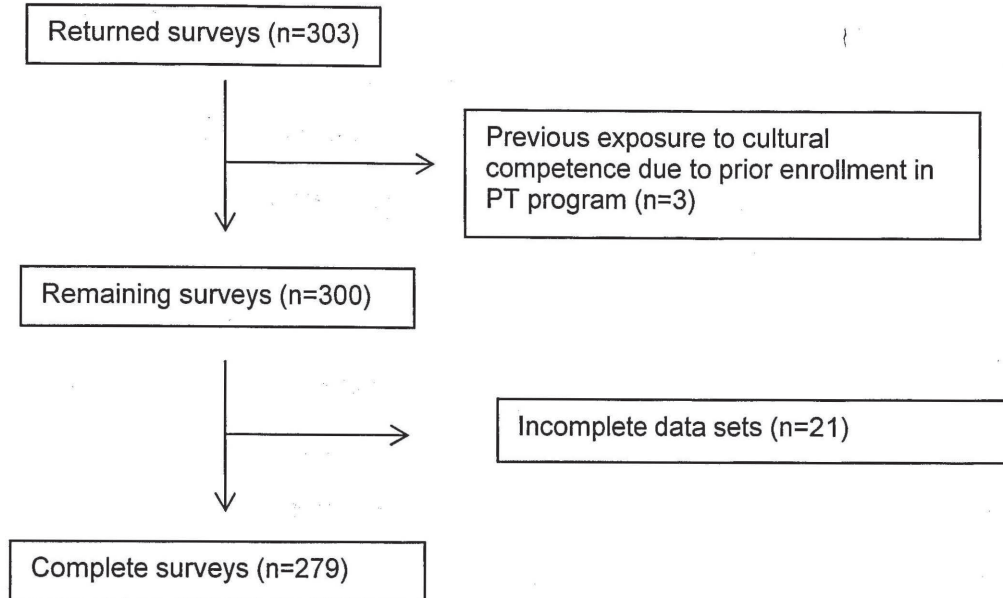
#### **STUDY I. CONSTRUCT VALIDITY**

##### **Subject Management and Description of Subjects**

There were 303 returned surveys (Figure 1). Data from 3 subjects (#15, 302, 309) were removed from the analysis due to previous exposure to cultural competence as a result of prior enrollment in a PT program. A total of 21 subjects' data were removed from the analysis due to incomplete data sets (age, gender, race, and IAPCC-SV©). Three subjects (#143, 182, 284) did not answer more than one component of the data sets (age, gender, race, IAPCC-SV©). A description of the number of subjects and the data they did not report follows. Since 3 subjects did not answer more than 1 component of the data set, the sum of the number of subjects to follow is greater than 21. Two subjects did not report age (#143, 284), 3 subjects did not report gender (#116, 138, 143), and 3 subjects did not report race (#182, 143, 284). Seventeen subjects were removed due to incomplete IAPCC-SV© surveys (#35, 75, 141, 142, 181, 182, 183, 231, 232, 233, 278, 279, 280, 281, 282, 283, 287). There was no pattern to the IAPCC-SV© questions that were not answered. The IAPCC-SV© questions not answered, number of subjects that did not answer the question, and the subject numbers of those who did not answer the questions are



presented in Table 1. There were 279 remaining data sets that were complete for age, gender, race, and complete IAPCC-SV©.



**Figure 1.** Study I subject recruitment and participation

**Table 1.** IAPCC-SV© Questions not Answered by Subjects

Question Number	Number of Subjects	Subject Numbers
Q2	1	231
Q3	4	75, 181, 182, 281
Q4	1	279
Q5	5	142, 181, 231, 281, 283
Q9	1	231
Q11	1	282
Q12	1	183
Q14	2	232, 280
Q15	2	35, 287
Q16	2	231, 233
Q17	1	75
Q18	2	141, 232
Q19	1	278

## Data Screening

The data were then screened for 5 issues including data coding errors, data entry errors, impossible and implausible values, and factor analysis assumptions. The data were screened for data coding errors by having the PI and a graduate assistant independently code all data. There was a discrepancy between the PI and graduate assistant for 2 data points. The data points were re-examined by the PI and graduate student and agreement between the coders was reached for the data points. The data were screened for all data entry errors by having the PI and graduate assistant independently compare all values in the spreadsheet to the raw data. There were no data entry errors. Inaccurate data were further screened for by evaluation of frequency distributions and histograms of the following variables: age, gender, majority/minority status, and each of the 20 IAPCC-SV© questions. The frequency distributions and histograms were reviewed for data coding and data entry errors as well as possible and plausible values. No data coding or data entry errors were identified and all values were possible and plausible.

The data were screened for factor analysis assumptions including outliers, normality, linearity, collinearity, and factorability. Portney and Watkins<sup>16</sup> define an outlier as a “numeric value that does not fall within the range of most scores in a distribution.” Outliers were screened for using ungrouped data. Univariate outliers were screened for by visual inspection of the frequency distributions and histograms for each variable. No univariate outliers were identified. Bivariate outliers were screened for by visual inspection of the bivariate scatterplots of all variables. No bivariate outliers were identified. Multivariate outliers were screened for by Mahalanobis’ distance.<sup>32</sup> The critical  $\chi^2$  value was 45.32, with  $\alpha < .001$ , and  $df=20$ . Five multivariate outliers were identified as their Mahalanobis’ distance was greater than the critical value (#76, 88, 230, 243, 293). Since the number of outliers was small and removing the outliers still provided an acceptable subject to variable ratio, the outliers were deleted from further analysis. After the 5

subjects' data were removed from the analysis the data were re-screened, as previously described, for outliers. No univariate, bivariate, or multivariate outliers were identified.

The assumption of normality is that the variables, which are each IAPCC-SV© item, are normally distributed.<sup>32</sup> Histograms of each IAPCC-SV© item were created. Upon visual inspection, not all of the variables were normally distributed. However, factor analysis is robust to violations of normality, although the factor analysis is improved when the variables are normally distributed.<sup>32</sup> The assumption of linearity is that there are linear relationships between variables.<sup>32</sup> Bivariate scatterplots were created for each IAPCC-SV© item with every other IAPCC-SV© item. Visual inspection of the scatterplots did not suggest any curvilinear relationships. The assumption of collinearity is that there is not a collinear relationship between any of the variables.<sup>32</sup> The bivariate scatterplots were visually inspected for strong correlations between items, and no strong correlations between items were identified. In addition, a correlation matrix was created to screen for collinearity between IAPCC-SV© items. The highest correlation between items was .64 (Q5 and Q16). Values greater than .65 suggest collinearity, therefore collinearity was not suspected in these data.<sup>35</sup> Additional collinearity diagnostics were performed for all variables and the largest variance inflation factor (VIF) was 2.41 for Q5. This finding further suggests that there was no collinearity. A VIF greater than 10 would have suggested collinearity.<sup>36</sup>

The assumption of factorability of the correlation matrix is that the data are appropriate for factor analysis.<sup>32</sup> The Kaiser-Meyer-Olkin (KMO) of Sampling Adequacy and Bartlett's Test of Sphericity were conducted to assess the appropriate use of a factor analysis.<sup>32</sup> The Kaiser-Meyer-Olkin test values range between 0 and 1, and a value above .60 is recommended.<sup>32</sup> The Kaiser-Meyer-Olkin test value, .80, was meritorious indicating that a factor analysis was appropriate.<sup>26</sup> The null hypothesis of Bartlett's Test of Sphericity is that the correlation matrix is an identity matrix.<sup>26</sup> An identity matrix is one in which the variables are not related to each other, potentially making a factor analysis inappropriate.<sup>32</sup> It is characterized by all of the diagonal

values = 1 and all of the off-diagonal values = 0.<sup>36</sup> Bartlett's test of Sphericity was significant ( $\chi^2=1209.26$ ,  $df=190$ ,  $p <.001$ ), confirming that the matrix was not an identity matrix and that the data were appropriate for a factor analysis.

Following the data screening, there were 274 subjects included in the analysis. The subject participation rate was less than the desired subject participation rate of 300 subjects. However, 274 subjects for 20 variables yields a 13.7 subjects per variable ratio. Although this is slightly less than the desired 15 subjects per variable ratio, it is consistent with the recommendations for high subject to variable ratios<sup>31</sup> and was deemed acceptable. For the included subjects, ages ranged from 19 to 43, and the average age was 24.25 (SD: 3.68). There were 94 males (34.3%) and 180 females (65.7%). There were 191 majority students (69.7%) and 83 minority students (30.3%).

## **Results**

Initially, the internal consistency of the instrument was calculated. The internal consistency as measured by Cronbach's alpha was .80. The IAPCC-SV© data were analyzed using an exploratory factor analysis to assess construct validity, and included factor extraction, factor rotation, and interpretation. Descriptive statistics including the means and standard deviations for the individual IAPCC-SV© questions are presented in Table 2.



**Table 2.** Means and Standard Deviations (SD) for IAPCC-SV© Questions

Question Number	Mean	SD
Q1	3.68	.48
Q2	3.57	.55
Q3	3.41	.55
Q4	1.87	.63
Q5	3.49	.62
Q6	3.00	.72
Q7	2.54	.72
Q8	2.66	.68
Q9	2.62	.64
Q10	3.74	.44
Q11	2.94	.73
Q12	2.49	.66
Q13	3.12	.51
Q14	3.08	.67
Q15	3.03	.61
Q16	3.24	.67
Q17	2.09	.60
Q18	3.15	.62
Q19	2.58	.79
Q20	3.61	.54

A correlation matrix for all variables was created. The correlation matrix reflects the relationship between each question and every other question. As previously noted, the highest correlation between items was .64 (Q5 and Q16). Given the numerous correlations presented in the matrix, interpretation of the individual relationships and patterns of relationships is difficult. To simplify the results' interpretation, the correlation matrix was utilized in the extraction aspect of the analysis to follow. Communalities (initial, extraction) were calculated and are presented in Table 3. The extraction communalities reflect the proportion of variance for each variable accounted for by the factor analysis.<sup>33</sup> Extraction communalities <.5 are considered low.<sup>33</sup> Six variables were identified

as being low: Q1, Q3, Q7, Q11, Q18, Q20 indicating that the factor analysis only accounted for a small amount of the variance associated with the variables.

**Table 3.** Initial and Extraction Communalities

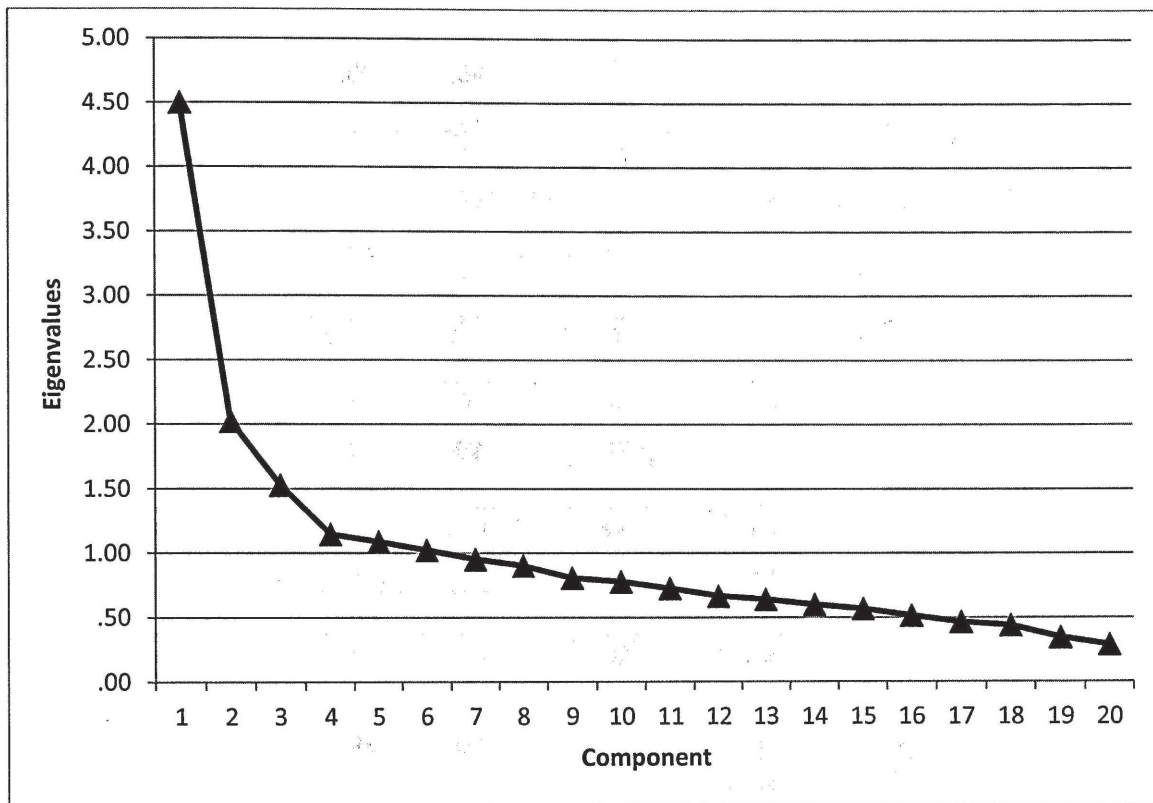
Question Number	Initial	Extraction
Q1	1	.459
Q2	1	.587
Q3	1	.390
Q4	1	.545
Q5	1	.747
Q6	1	.602
Q7	1	.449
Q8	1	.623
Q9	1	.583
Q10	1	.507
Q11	1	.477
Q12	1	.565
Q13	1	.674
Q14	1	.692
Q15	1	.559
Q16	1	.656
Q17	1	.717
Q18	1	.296
Q19	1	.752
Q20	1	.430

Eigenvalues, which reflect the amount of variance accounted for by each factor, were then calculated.<sup>26</sup> Eigenvalues greater than 1 are considered stable.<sup>33</sup> All factors for which eigenvalues were greater than 1 were extracted (Table 4). This resulted in six factors being identified by the factor analysis. The six factors accounted for 56.55 % of the variance of the IAPCC-SV© score.

**Table 4. Initial Eigenvalues, Extraction Sums of Squared Loading and Rotation Sums of Squared Loadings**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance	% of Cumulative	Total	Variance	% of Cumulative	Total	Variance	% of Cumulative
1	4.50	22.50	22.50	4.50	22.50	22.50	2.99	14.94	14.94
2	2.02	10.12	32.62	2.02	10.12	32.62	2.20	11.02	25.95
3	1.53	7.64	40.26	1.53	7.64	40.26	1.72	8.60	34.56
4	1.15	5.73	45.99	1.15	5.73	45.99	1.60	7.99	42.55
5	1.09	5.44	51.43	1.09	5.44	51.43	1.50	7.48	50.03
6	1.02	5.11	56.55	1.02	5.11	56.55	1.30	6.51	56.55
7	.95	4.76	61.31						
8	.90	4.51	65.82						
9	.81	4.04	69.85						
10	.78	3.89	73.74						
11	.73	3.63	77.38						
12	.67	3.33	80.71						
13	.64	3.21	83.91						
14	.60	3.00	86.92						
15	.57	2.84	89.76						
16	.51	2.57	92.33						
17	.46	2.32	94.65						
18	.44	2.19	96.84						
19	.34	1.72	98.56						
20	.29	1.44	100.00						

The eigenvalues were plotted against the factors in a scree plot (Figure 2). Visual inspection of the plot suggested that there were 6 factors.



**Figure 2.** Scree plot of eigenvalues and factors

The initial factor matrix (component matrix), is presented in Table 5. This matrix includes the correlations of each variable with each component (factor).



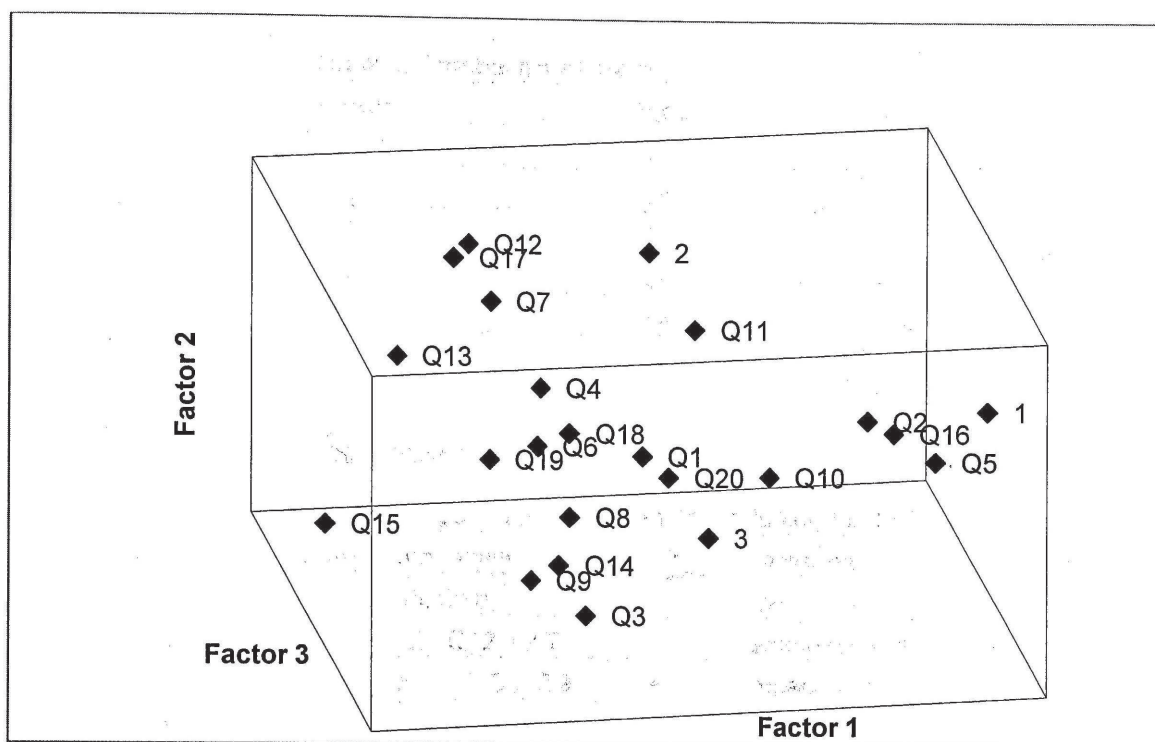
**Table 5. Component Matrix**

Question	Component					
	1	2	3	4	5	6
Q1	.39	-.28	.31	-.22	-.20	.20
Q2	.60	-.34	-.27	-.11	-.14	.08
Q3	.37	-.07	.21	-.15	.36	.22
Q4	.39	.51	-.28	-.14	.02	.19
Q5	.68	-.39	-.33	-.14	-.02	.06
Q6	.55	.17	.27	-.08	.12	-.42
Q7	.50	.33	.09	.20	-.19	-.07
Q8	.57	.33	.12	-.06	.31	.28
Q9	.43	.34	.11	-.28	.42	.12
Q10	.59	-.38	.04	.05	.03	-.09
Q11	.62	.02	-.16	.18	-.16	-.08
Q12	.43	.35	.19	-.09	-.46	-.04
Q13	.27	-.08	.34	.63	-.19	.22
Q14	.23	-.22	-.19	.58	.41	.22
Q15	.03	-.12	.71	-.13	-.04	.15
Q16	.60	-.33	-.38	-.16	-.08	-.06
Q17	.41	.64	-.22	.11	-.23	.16
Q18	.49	.02	.15	.17	.04	.03
Q19	.43	.12	.10	.16	.25	-.68
Q20	.42	-.41	.27	-.09	-.10	-.03

The reproduced and residual correlation matrices were created and reviewed. The initial factor matrix was rotated using the orthogonal varimax solution to simplify interpretation of the results. Variables with a factor loading absolute value of .40 or higher<sup>16</sup> were identified for each factor. Question 18 did not load on a factor and was eliminated. The following questions loaded on 2 factors: Q4 (factor 2 and 3), Q11 (factor 1 and 2), and Q20 (factor 1 and 4). The rotated component matrix is presented in Table 6 and graphically with the first 3 components (factors) in Figure 3. A summary of the factors and the variables that highly loaded each factor is presented in Table 7.

**Table 6. Rotated Component Matrix**

Question Number	Component					
	1	2	3	4	5	6
Q1	.36	.09	.11	<b>.55</b>	-.06	-.01
Q2	<b>.75</b>	.13	.07	.06	-.01	.05
Q3	.17	-.08	<b>.54</b>	.23	.06	.11
Q4	.12	<b>.52</b>	.41	-.28	-.06	-.11
Q5	<b>.84</b>	.06	.16	.00	.04	.06
Q6	.15	.23	.25	.18	<b>.65</b>	-.06
Q7	.10	<b>.56</b>	.09	.07	.28	.18
Q8	.11	.32	<b>.68</b>	.07	.09	.16
Q9	.04	.16	<b>.72</b>	.01	.18	-.10
Q10	<b>.58</b>	-.02	.09	.22	.27	.21
Q11	<b>.46</b>	<b>.40</b>	.03	-.04	.23	.21
Q12	.09	<b>.67</b>	.00	.27	.14	-.13
Q13	-.01	.25	-.13	.33	.03	<b>.70</b>
Q14	.20	-.18	.18	-.25	.00	<b>.72</b>
Q15	-.19	-.06	.13	<b>.71</b>	.02	.03
Q16	<b>.79</b>	.08	.07	-.07	.09	-.04
Q17	.01	<b>.78</b>	.20	-.24	-.03	.06
Q18	.21	.23	.20	.17	.22	.28
Q19	.10	.07	.08	-.10	<b>.85</b>	.07
Q20	<b>.42</b>	-.05	.02	<b>.47</b>	.16	.08



**Figure 3.** Component plot in rotated space

**Table 7.** Variables that Loaded Highly by Factor

<b>Factor</b>	<b>Variables that highly loaded factor</b>
1	Q2, Q5, Q10, Q11, Q16, Q20
2	Q4, Q7, Q11, Q12, Q17
3	Q3, Q4, Q8, Q9
4	Q1, Q15, Q20
5	Q6, Q19
6	Q13, Q14

Cronbach's alpha for each factor, with and without each item, was determined. The item would be removed from the factor if Cronbach's alpha increased by .10 without an item.<sup>37</sup> The Cronbach's alpha values for the factors are presented in Table 8. None of the factors demonstrated a .10 increase in alpha if an item was deleted; therefore, no items were removed from the factors.

**Table 8. Cronbach's Alpha by Factor**

Factor	Alpha
1	.78
2	.66
3	.58
4	.38
5	.54
6	.28

The 6 factors were interpreted while only 3 factors were retained and named (Table 9).

**Table 9. Variables that Loaded Highly by Factor Including Factor Names**

Factor	Variables that highly loaded factor	Factor name
1	Q2, Q5, Q10, Q11, Q16	openness/desire
2	Q7, Q12, Q17	access/evaluation
3	Q3, Q4, Q8, Q9	impact of culture on health
4	Q1, Q15	
5	Q6, Q19	
6	Q13, Q14	

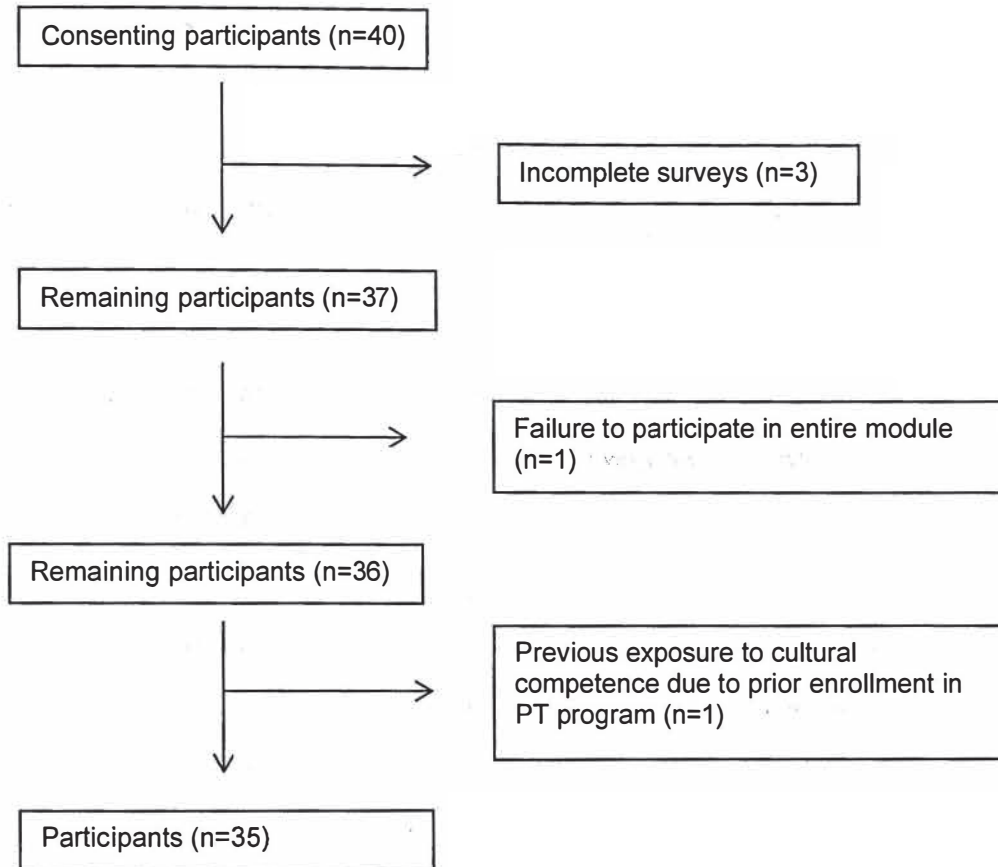
## **STUDY II. RESPONSIVENESS**

### **Subject Management and Description of Subjects**

There were a total of 40 participants who consented to participate in the responsiveness portion of the study (Figure 4). Five of these subjects were removed from the final analysis due to incomplete surveys for Time 1 or Time 2 (3 subjects: #26, #35, #49), failure to participate in the entire module of the study (1 subject: #14), or prior exposure to cultural competence instruction as a result of previous enrollment in a PT program (1 subject: #15). There was no pattern to the questions that were not answered (Q# 3, 15, 18). There were 35 complete IAPCC-SV© surveys for Time I and II that were included in the final analysis. For the included subjects, the average



age was 24.86 (SD: +/- 3.43, range: 20-33y/o). There were 17 males (48.57%) and 18 females (51.43%). There were 21 majority students (60%) and 14 minority students (40%).



**Figure 4.** Study II subject recruitment and participation

### Data Screening

The data were entered in a SPSS<sup>21</sup> spreadsheet and screened for recording errors, data entry errors, implausible and impossible values. The data were screened for data coding errors by having the PI and a graduate assistant independently code all data. It was determined there were no data coding errors following those independent coding activities. The data were screened for all data entry errors by printing out the data spreadsheet and having the PI and

graduate assistant independently compare all values in the spreadsheet to the raw data. There were no data entry errors identified following those independent comparisons. Frequencies and histograms were created for the following variables: Subject #, Site #, Group #, Individual Questions 1-20 Time 1 (pre-test), Individual Questions 1-20 Time 2 (post-test), IAAPCC-SV Total Score Time 1 (pre-test), and IAPCC-SV© Total Score Time 2 (post-test). The frequency distributions and histograms were reviewed for recording errors, data entry errors, implausible values, and impossible values. No recording or data entry errors were identified following that review, and all values were possible and plausible.

The data were then screened for the assumptions for independent samples ANOVA including independence, normality, and homogeneity of variance. The assumption of independence is that each subject is independent of every other subject, and subjects are not related to each other in any way.<sup>38</sup> The assumption of independence was met as the subjects were not related to each other, and completed the surveys independently. The assumption of normality is that there is a normal distribution of the dependent variable scores for each group.<sup>32</sup> The assumption of normality was screened by visual inspection of frequency distributions and histograms of the post test scores that were created for each group. Upon visual inspection, the control group (professional behaviors) appeared to be positively skewed and the experimental group (cultural competence) appeared to be normally distributed. However, the global ANOVA is robust to violations of normality.<sup>38</sup> The assumption of homogeneity of variance is that the population variances are the same.<sup>32</sup> The assumption of homogeneity of variance was confirmed by Levene's test ( $F_{1,33}=.760$ ;  $p=.390$ ).

These data were also screened for the assumptions of covariates including reliability, linearity, no interaction with the independent variable, and parallelism of regression slopes. The assumption of reliability is that there is no measurement error of the covariate (pre-test IAPCC-SV© Total Score Time 1).<sup>32</sup> In the Okere et al<sup>9</sup> study, the IAPCC-SV© demonstrated reliability as

test-retest reliability=.87 and internal consistency=.75 when used with student physical therapists. The assumption of linearity is that there is a linear relationship between the covariate (pre-test IAPCC-SV© Total Score Time 1) and the dependent variable (post-test IAPCC-SV© Total Score Time 2).<sup>32</sup> The assumption of linearity was screened through visual inspection of the scatterplots fitted with least squares regression lines. Visual inspection of the scatterplots suggested there was a linear relationship between the covariate (pre-test score: IAPCC-SV© Total Score Time I) and the dependent variable (post-test score: IAPCC-SV© Total Score Time II) for each group. According to Portney and Watkins,<sup>16</sup> a covariate is most effective when it has a correlation with the dependent variable that is  $>.60$ . Linearity was confirmed as the correlation of the covariate (pre-test: IAPCC-SV© Total Score Time 1) with the dependent variable (post-test: IAPCC-SV© Total Score Time 2) for each group was  $>.6$ . For the control group (professional behaviors)  $r=.75$ , and for the experimental group (cultural competence)  $r=.61$ .

The assumption of no interaction with the independent variable is that the covariate does not interact with the grouping variable (control vs experimental group).<sup>32</sup> The assumption of parallelism of the regression slopes is that the regression slope of the covariate (pre-test: IAPCC-SV© Total Score Time 1) and the dependent variable (post-test: IAPCC-SV© Total Score Time II) is the same for the control and experimental groups.<sup>32</sup> The assumptions that the covariate (pre-test: IAPCC-SV© Total Score Time 1) does not interact with the independent variable (group) and that the regression slopes of the two groups are parallel were evaluated simultaneously. There was no interaction between the covariate (pre-test score: IAPCC-SV© Total Score Time 1) and the independent variable (group) ( $F_{1,31}=.55$ ;  $p=.47$ ), which simultaneously confirms that the regression slopes of the two groups are parallel.

## Results

The group means were adjusted for the pre-test score. Table 10 summarizes the actual post-test (IAPCC-SV© Total Score Time 2) means and the adjusted means after controlling for pre-test score. The adjusted group mean of the experimental group was significantly higher than the adjusted group mean of the control group ( $F_{1,32}=26.56$ ;  $p<.001$ ). The significant difference in the post-test adjusted mean scores between the control and experimental groups suggests the instrument was responsive to changes in the experimental group's cultural competence following participation in the cultural competence learning module.

**Table 10.** Actual and Adjusted Mean Post-test Score

	<b>Actual Mean (SD)</b>	<b>Adjusted Mean (SD)</b>
Control	60.56 (5.20)	60.03 (4.16)
Experimental	66.76 (5.77)	67.32 (4.16)

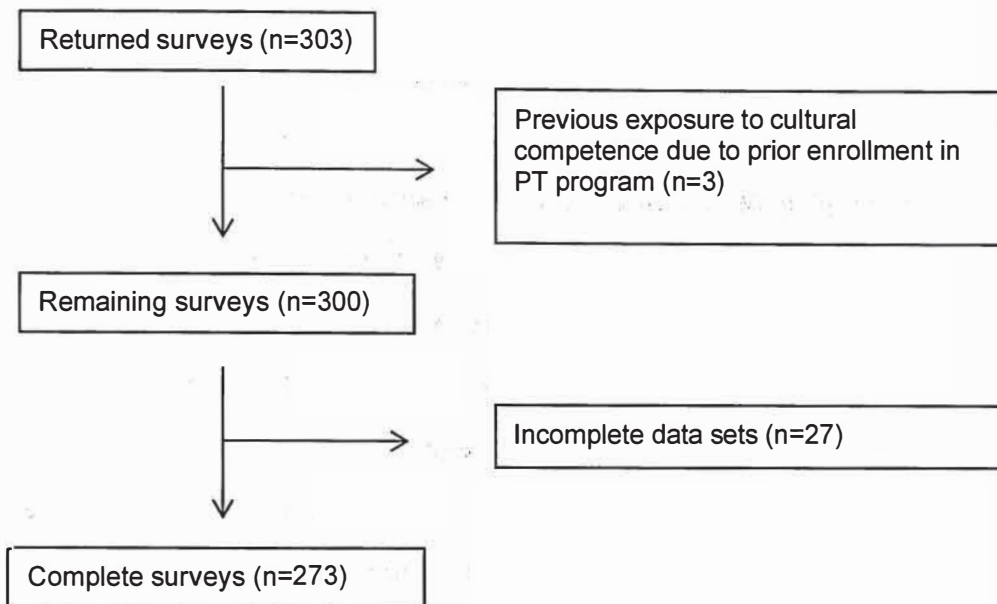
## STUDY III. REGRESSION ANALYSIS

### Subject Management and Description of Subjects

There were 303 returned surveys (Figure 5). Three subjects (#15, 302, 309) were removed from the analysis because they previously had cultural competence education due to previous enrollment in PT school. There were 27 subjects removed from the analysis due to incomplete data sets (age, gender, race, cultural composite score, IAPCC-SV©). Several subjects did not answer more than 1 component of the data sets (age, gender, race, cultural composite score, IAPCC-SV©). A description of the number of subjects and the data they did not report follows. Since several subjects did not answer more than 1 component of the data set, the sum of the number of subjects to follow is greater than 27. Two subjects did not answer age (#143, 284), 3 subjects did not answer gender (#116, 138, 143), 3 subjects did not answer race (#143, 182, 284), 8 did not answer all of the questions for the cultural composite score (#48, 139,



140, 143, 155, 217, 284, 305) and 17 did not answer all IAPCC-SV© questions. The IAPCC-SV© questions not answered, number of subjects that did not answer the question, and the subject numbers of those who did not answer the questions are presented in Table 11. There were 273 remaining data sets that were complete for age, gender, race, cultural composite score, and IAPCC-SV© score.



**Figure 5.** Study III Subject recruitment and participation

**Table 11.** IAPCC-SV© Questions not Answered by Subjects

Question Number	Number of Subjects	Subject Numbers
Q2	1	231
Q3	4	75, 181, 182, 281
Q4	1	279
Q5	5	142, 181, 231, 281, 283
Q9	1	231
Q11	1	282
Q12	1	183
Q14	2	232, 280
Q15	2	35, 287
Q16	2	231, 233
Q17	1	75
Q18	2	141, 232
Q19	1	278

## Data Screening

The data were then screened for the following issues: data coding errors, data entry errors, impossible and implausible values, evaluation of regression model assumptions, influence analysis, and collinearity. The data were screened for data coding errors by having the PI and a graduate assistant independently code all data. There was a discrepancy between the PI and graduate assistant for 2 data points. The data points were re-examined by the PI and graduate student and agreement between the coders was reached for the data points. The data were screened for all data entry errors by having the PI and graduate assistant independently compare all values in the spreadsheet to the raw data. There were 2 data entry errors. The data points were re-examined by the PI and graduate student and agreement between the coders was reached for the data points. Inaccurate data were further screened for by evaluation of frequency distributions and histograms. Frequency distributions and histograms were created for each of the predictor variables (majority/minority status, cultural composite score) and the outcome variable (IAPCC-SV© Total Score) as well as the following variables: subject number, age, gender, race, each of the demographic questions #4-10, and each of the 20 IAPCC-SV© questions. The frequency distributions and histograms were reviewed for data coding and data entry errors as well as possible and plausible values. No data coding or data entry errors were identified and all values were possible and plausible.

These data were screened for adherence to the following assumptions: linearity, homoscedasticity, normality, and independence related to time. The assumption of linearity is that there are linear relationships between variables.<sup>32</sup> Bivariate scatterplots were created between each predictor variable (majority/minority status, cultural composite score) and the outcome variable (IAPCC-SV© total score). In addition, the standardized residuals scatterplot was created. Visual inspections of the scatterplots did not suggest any curvilinear relationships.

The assumption of homoscedasticity is that the variance of the residuals is approximately the same for all predicted values.<sup>32</sup> The residuals scatterplot was created and visually inspected. The variance of the residuals appeared to be approximately the same for all predicted values. Therefore, there was no violation of homoscedasticity. In addition, regression is robust to violations of homoscedasticity.

The assumption of normality is that there is a normal distribution of values about the regression line.<sup>36</sup> A histogram of the residuals and the normal probability plot of the residuals were created to evaluate the assumption of normality. The histogram of the residuals was normally distributed, with the mean approximating 0, the majority of points falling between -1 and +1 SD, and all points fell within -3 and +3 SD. There were no detached points. In addition the normal probability plot revealed all values close to the line with no notable deviations from the line, which is consistent with the normal distribution. The histogram and normal probability plot did not indicate a violation of the assumption of normality. In addition, regression is robust to violations of normality.<sup>32</sup>

The assumption of independence related to time is that the outcome is not dependent upon time.<sup>32</sup> The assumption of independence related to time was addressed through several methods. First, the study was designed so that the outcome would be independent of time as all subjects were tested prior to the delivery of any cultural competence education. Subject number can be used to reflect time as the subjects were assigned subject numbers sequentially. Bivariate scatterplots of subject number and IAPCC-SV© total score and residuals scatterplot using subject number as the predictor and IAPCC-SV© total score as the outcome were created. No pattern of data points was observed on either of the scatterplots, suggesting that there was not a violation of independence related to time. Finally, a line graph of IAPCC-SV© score as a function of subject number was created. Visual inspection revealed that there was no identifiable pattern to IAPCC-SV© score. It was concluded that there was not a violation of the assumption of independence

related to time. It is critical that this assumption was not violated, because violations of this assumption can be very serious violations.<sup>36</sup>

Next, the data were screened for influence analysis. Outliers were screened for using ungrouped data. Univariate outliers were screened for by visual inspection of the frequency distributions and histograms for each variable. No univariate outliers were identified. Bivariate outliers were screened for by visual inspection of the bivariate scatterplots of all variables. No bivariate outliers were identified. Multivariate outliers were screened for by standardized difference in fit (DFFITs). A frequency distribution and histogram of DFFITs were obtained. They were evaluated for very high and low DFFITs and detached values. The histogram of the DFFITs was normally distributed, with the mean approximating 0 and all points falling between  $-.3$  and  $+.4$  SD. No very high or low values were identified, and therefore no multivariate outliers were identified. As a result of this screening, it was concluded that there were no univariate, bivariate, or multivariate outliers.

The assumption of collinearity is that there is not a collinear relationship between the predictors.<sup>32</sup> Collinearity was examined through several methods. The bivariate scatterplot of the predictors was evaluated for a strong correlation and a strong correlation was not identified. In addition, the correlation between the predictor variables was performed to determine the relationship between the predictor variables (majority/minority status, cultural composite score). The point bi-serial correlation was  $.19$ , therefore collinearity was not suspected. A correlation of  $.65$  or higher would have suggested collinearity.<sup>35</sup> The VIF between the predictor variables was determined as an additional collinearity diagnostic. The VIF between the predictor variables was  $1.038$ , which suggested that there was not collinearity between the predictor variables. A VIF of  $10$  or greater would have suggested collinearity.<sup>36</sup> It was concluded that collinearity between the predictor variables did not exist.



In summary these data were screened for the following issues: data coding errors, data entry errors, impossible and implausible values, evaluation of regression model assumptions, influence analysis, and collinearity. Upon completion of the screening, it was not necessary to remove any of these data from further analysis. Therefore, there remained 273 data sets that were complete for age, gender, race, cultural composite score, and IAPCC-SV© score. The subject participation was higher than the desired subject participation of 244. For the included subjects, the average age was 24.30 (SD: 3.80, range: 19-43 y/o). There were 94 males (34.4%) and 179 females (65.6%). There were 190 majority students (69.6%) and 83 minority students (30.4%). The means and standard deviations for cultural composite score and IAPCC-SV© total score are presented in Table 12.

**Table 12.** Cultural Composite Score and IAPCC-SV© Total Score Means and Standard Deviations

	Mean	SD
Cultural composite score	12.14	4.67
IAPCC-SV© total score	59.82	5.75

## Results

Linear regression analysis ( $R^2$  method) was performed to determine if cultural composite score predicted IAPCC-SV© score and if majority/minority status, over and above cultural composite score, predicted IAPCC-SV© score. Cultural composite score predicted IAPCC-SV© score,  $R^2=.22$ ,  $F_{1,271}=77.16$ ;  $p<.01$ . The finding indicated that the cultural composite score accounted for 22% of the IAPCC-SV© score's variance. Majority/minority status did not predict IAPCC-SV© score, over and above cultural composite score,  $R^2$  change=.008,  $F_{1,270}=2.66$ ;  $p=.11$ . The regression equation for cultural composite score predicting IAPCC-SV© total score was IAPCC-SV© total score = 52.79 + (.58) cultural composite score. There was no interaction between the predictor variables,  $R^2$  change=.001,  $F_{1,269}=.183$ ;  $p=.67$ , indicating that the cultural

composite score's ability to predict IAPCC-SV© was not different for the different levels of majority/minority status.

## CHAPTER V

### DISCUSSION AND CONCLUSION

The purpose of this study was threefold. Study I established the construct validity (via factor analysis) of the IAPCC-SV©. Study II determined the responsiveness of the IAPCC-SV©, and Study III investigated the ability of the cultural composite score and minority/majority status to predict the IAPCC-SV© score. An interpretation and discussion of the study's results follows. Conclusions, limitations, implications, and suggestions for future research are also presented.

### DISCUSSION

#### Study I

Study I established the construct validity (via factor analysis) of the IAPCC-SV©. It was hypothesized that the variables would load on only 1 component, with each component being represented by a number of strongly loaded variables. First, the internal consistency of the IAPCC-SV© was determined. The internal consistency of the IAPCC-SV© as measured by Cronbach's alpha was .80, which is good.<sup>26</sup> This finding was higher than in the Okere et al<sup>9</sup> study, in which Cronbach's alpha was .75. The Okere et al<sup>9</sup> study consisted of 40 student physical therapists while the current study sampled 273 student physical therapists. Given the large sample size of the current study, the internal consistency of the current study is likely to more accurately reflect the instrument's internal consistency with student physical therapists. This finding is also slightly higher than Fitzgerald et al<sup>14</sup> who documented Cronbach's alpha = .78 with 90 nursing students. The published literature documenting the IAPCC-SV©'s internal consistency is limited; however, the results of the current study are also consistent with several unpublished studies.<sup>19</sup> The comparable results of the current study and previous studies<sup>9,14,19</sup> support the

reproducibility of the instrument's internal consistency. The good internal consistency of .80 supports the instrument's reliability with PT students and use with this population.<sup>26</sup> Following the internal consistency's interpretation, the results of the factor analysis were interpreted.

The factor analysis identified questions that did not load on a factor as well as those that loaded on multiple factors. Question 18 addressed students' comfort level with eliciting information about a client's ethnic background.<sup>3</sup> This question did not load on any factor. This finding was not anticipated; however, in hindsight it was not surprising. Careful review of all other questions revealed that none of the other questions directly related to eliciting information from clients about their culture. The other questions addressed concepts such as the students' beliefs, knowledge, and awareness, as opposed to comfort level directly eliciting information from clients.<sup>3</sup> It is likely that this question did not load on a factor because it is in fact distinct from the other questions.

Several of the variables loaded on more than one component. Questions 4, 11, and 20 each loaded on 2 factors. Question 4 addressed students' knowledge of ethnic pharmacology and loaded on factors 2 and 3.<sup>3</sup> Question 4 loaded higher on factor 2 (.52) than factor 3 (.41); however, review of the other variables on each factor suggested that it had more in common with factor 3 than factor 2. Therefore, question 4 was retained on factor 3. Question 11 addressed how students pursue information to improve their understanding of diverse clients, and loaded on factors 1 and 2.<sup>3</sup> Question 11 loaded more highly on factor 1 (.46) than on factor 2 (.41) and review of the other variables on each factor suggested that it had more in common with factor 1 than 2. Therefore, question 11 was retained on factor 1. Question 20 addressed the students' beliefs about the role of wanting to become culturally competent.<sup>3</sup> Question 20 loaded on factors 1 and 4. Question 20 loaded more highly on factor 4 (.47) than factor 1 (.42), however review of the other variables on each factor suggested that it did not have much in common with either factor. Therefore, question 20 was not retained on a factor.



Following the removal of questions 18 and 20, and the assignment of questions 4 and 11, the factors were interpreted. The factor analysis yielded 6 factors. Factors 4, 5 and 6 only had 2 variables for each factor. According to Gardner<sup>33</sup> generally speaking at least 3 variables are necessary to identify a factor. Therefore, although 6 factors were initially extracted, in the final analysis, only factors 1, 2 and 3 were retained. The 3 factors included 12 of the original 20 variables.

Factor 1 included questions 2, 5, 10, 11, and 16. These questions addressed personal commitment, motivation, and passion to care for diverse patients.<sup>3</sup> They also addressed the students' inclination to learn from other people and pursue additional information when working with diverse patients.<sup>3</sup> This factor was termed openness/desire. The Cronbach's alpha for this factor was .78, which according to George and Mallery<sup>26</sup> is acceptable, approaching good.

Factor 2 included questions 7, 12, and 17. These questions addressed knowledge about cultural evaluations, limitations of medical evaluation tools, and institutional barriers.<sup>3</sup> All of these questions were related to specific knowledge about access and evaluation issues, therefore the factor was termed access/evaluation. The Cronbach's alpha for this factor was .58, which according to George and Mallery<sup>26</sup> is poor, approaching questionable. Although the internal consistency is approaching questionable for this factor, some authors consider .6 appropriate for exploratory research.<sup>39</sup>

Factor 3 included questions 3, 4, 8, and 9. These questions addressed general opinions about the relationship between culture and health as well as specific information about ethnic pharmacology, biological variation, and pathologies among diverse groups.<sup>3</sup> These questions addressed the general relationship between culture and health as well as specific knowledge about the implications of culture on the practice of medicine. Therefore, this factor was termed impact of culture on health. The Cronbach's alpha for this factor was .58, which according to George and Mallery<sup>26</sup> is poor, approaching questionable reliability. Again, although the internal

consistency is approaching questionable for this factor, some authors consider .6 appropriate for exploratory research.<sup>39</sup>

Although this was not a confirmatory factor analysis, the proposed constructs of the IAPCC-SV© were considered in light of this study's results. Campinha-Bacote<sup>3</sup> proposed 5 constructs for the IAPCC-SV© including, cultural desire, encounters, skill, knowledge, and awareness. These 5 constructs corresponded to the original 5 subscales of the IAPCC-SV©. Campinha-Bacote<sup>14</sup> later re-conceptualized the original 5 subscales into 2 subscales. The subscales of awareness, knowledge, encounters, and skills were combined into the cultural composite subscale, while the original cultural desire subscale was retained as the second subscale. The original and re-conceptualized subscales were considered in light of the current study's results.

The original construct of cultural desire includes questions 2, 5, 16, and 20.<sup>3</sup> The construct of cultural desire does appear to have some support from this study as questions 2, 5, and 16 all loaded on factor 1. They were not the only variables that loaded on factor 1; however, they all did load together on factor 1. It is interesting to note that Campinha-Bacote<sup>3</sup> proposes that question 20 is part of the same construct. This is interesting because originally question 20 loaded on 2 factors: 1 and 4. It loaded higher on factor 4 (.47) than factor 1 (.42) but upon review did not appear to be consistent with either of the other variables on those factors, so it was not retained on either factor. Even though the interpretation for this study did not place question 20 on factor 1, the data do provide some support for the cultural desire construct to include question 20 with 2, 5, and 16 on a factor.

The construct cultural skill includes questions 7, 17, and 18.<sup>3</sup> This construct does have some support from this study as both questions 7 and 17 loaded on factor 2. Again, they were not the only variables to load on factor 2, but they both did load on the same factor. It is interesting to note that Campinha-Bacote<sup>3</sup> proposes that question 18 is included on this factor with questions 7

and 17. Question 7 addresses drawbacks of medical evaluation tools, and question 17 addresses cultural evaluation tools.<sup>3</sup> These 2 questions appear to be related to each other. Question 18 addresses students' comfort level with eliciting information about a client's culture.<sup>3</sup> Students' comfort level with eliciting information about a client's culture (question 18) appears to be distinctly different than students' understanding of cultural evaluation tools and the drawbacks of medical evaluation tools (questions 17 and 7). This determination was supported by the current study as question 18 did not load on factor 2 with questions 7 and 17.

The construct of cultural knowledge includes questions 4, 6, 8, 9, and 12.<sup>3</sup> Again there is some support for this factor. In the current study, questions 4, 8, and 9 all loaded on factor 3. Similar to the previous factors, they were not the only questions that loaded on the factor; however, they did all load together on the same factor. Questions 4, 8, and 9 are knowledge based questions, regarding ethnic pharmacology, biologic variation, and pathologies among diverse groups.<sup>3</sup> These 3 questions appear to be related to specific medical knowledge. Questions 6 and 12 also ask the students about knowledge; however, it appears to be a different type of knowledge. Question 6 asks students about knowledge of customs, principles etc. of diverse groups and question 12 asks students about knowledge of institutional barriers to medical care.<sup>3</sup> Perhaps this difference in the type of knowledge addressed in the questions accounts for questions 6 and 12 not loading on the same factor as questions 4, 8, and 9, as Campinha-Bacote<sup>3</sup> proposed.

Cultural encounters is another construct proposed by Campinha-Bacote,<sup>3</sup> and includes questions 10, 11, 13, 14, 19. The current investigation did not support this construct. Questions 10 and 11 did load on the same factor (factor 1) and appear to be related. Question 10 addresses students' inclination to learn from other people and question 11 addresses the pursuit of additional information to improve students' understanding of diverse clients.<sup>3</sup> These questions relate to motivation to learn and obtain information about culture. The fact that questions 10 and

11 did load on the same factor suggest that there is a relationship between these questions. Questions 13 and 14 did load on the same factor as each other (factor 6) but it was a different factor than questions 10 and 11 (factor 1). Question 13 addressed students' awareness of their personal shortcomings related to cultural competence and question 14 addressed students' responses when their principles do not match clients' principles.<sup>3</sup> These questions appear to be related to each other as they both address limitations or conflict related to culture. However, they appear to be different from questions 10 and 11 that dealt with inclination/motivation to obtain information.<sup>3</sup> The fact that questions 13 and 14 loaded on the same factor suggested that there is a relationship between these 2 variables, although their relationship with questions 10 and 11 may not be as originally suggested by Campinha-Bacote.<sup>3</sup> Finally, question 19 did not load on a factor with any of the other questions proposed to reflect the construct of cultural encounters. Question 19 addressed students' interaction with diverse groups other than as a healthcare provider.<sup>3</sup> This question about actual involvement appears to be different than the inclination/motivation (questions 10 and 11) or limitations/conflict (questions 13 and 14) questions. Therefore it is not surprising that it did not load on the same factor as any of these variables.

Finally, cultural awareness is the last construct proposed by Campinha-Bacote, and includes questions 1, 3 and 15.<sup>3</sup> The current study identified questions 1 and 15 loading on factor 4, so there is some evidence to support a relationship between those 2 variables. In addition, question 3 which addressed students' opinions about the relationship between culture and health, loaded on factor 3 and not with questions 1 and 15.<sup>3</sup> Other questions included on factor 3 asked about specific knowledge of ethnic pharmacology, biological variation, and pathologies among diverse groups.<sup>3</sup> This appears to be a better fit for this variable than with questions 1 and 15.

In addition to comparing this study's results to the original factors proposed by Campinha-Bacote, the results were also compared to the re-conceptualized subscales. The re-



conceptualized subscale of cultural desire is the same as the original subscale of cultural desire, and has been discussed previously. The re-conceptualized subscale of cultural composite included questions: 1, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, and 19.<sup>14</sup> This factor analysis did not support that factor structure as those variables loaded across 6 different factors. In summary, the results of this study provide some support for the cultural desire subscale, but not the cultural composite subscale.

The results of this study can also be compared to those of Olt et al<sup>10</sup> and Ho and Lee.<sup>11</sup> It should be noted that both Olt et al<sup>10</sup> and Ho and Lee<sup>11</sup> performed a factor analysis on the IAPCC-R©, not the IAPCC-SV©. However, all of the questions that are included on the IAPCC-SV© are also included on the IAPCC-R©, so it is reasonable to make some limited comparisons between the results of the studies.

The Olt et al<sup>10</sup> study can be interpreted using the same factor loading criteria (.4) utilized in the current study. Using .4 as the factor loading criteria, 8 of 25 questions loaded on more than 1 variable. To simplify interpretation, the variable was assigned to the factor with the highest loading. Similar to the current study, several questions that loaded on the same factor in this study loaded on the same factor in the Olt et al study. IAPCC-SV© questions 2 and 5 loaded together on a factor in both studies; however the factors that they loaded on differed. This pattern was the same for IAPCC-SV© questions 11, 16, and 20 as well as IAPCC-SV© questions 8 and 9. The similar results between the Olt et al and the current study support reproducibility of the indicated questions loading on the same factor. Therefore, there is support for retaining these questions together on the same factor in future studies. However, since the factors that they loaded on differed between studies, further investigation is needed to clarify the factor structure.

The Ho and Lee<sup>11</sup> study performed a factor analysis with the IAPCC-R©. Ho and Lee<sup>11</sup> concluded that the IAPCC-R© did not have “an identifiable factor structure”. In contrast, the current study does provide support for a 3 factor structure of the IAPCC-SV©, although the

factors appear to be different than both the original and re-conceptualized factors proposed by Campinha-Bacote.<sup>3,14</sup> Factor loadings were not provided for the Ho and Lee<sup>11</sup> study so independent interpretation of the factor structure was not able to be performed.

Portney and Watkins<sup>16</sup> suggest that it is necessary to perform a factor analysis on multiple samples prior to making definitive conclusions about the inclusion or removal of variables. Therefore, although this study suggests deletion of variables and proposes factor names based on the results of this analysis, these results should be interpreted with due caution. Since the PI did not identify any published factor analyses for the IAPCC-SV©, it is necessary to wait until additional factor analyses are performed. Only then is it appropriate to draw conclusions about inclusion or removal of variables and factor identification.

## **Study II**

Study II examined the IAPCC-SV©'s responsiveness to differences in student physical therapists' cultural competence. It was hypothesized that the IAPCC-SV© would demonstrate responsiveness, evidenced by the experimental group demonstrating significantly higher post-module IAPCC-SV© scores when compared to the control group. In the current study, the IAPCC-SV© demonstrated responsiveness as the post-test scores of the experimental group (cultural competence module) were significantly higher than the post-test scores of the control group (professional behaviors module), when controlling for pre-test score. To date, the PI did not identify any published studies that have documented the IAPCC-SV©'s responsiveness with student physical therapists. Therefore, it is most appropriate to compare this study's results to studies that have utilized the IAPCC-R© with PT students.

The current study's findings are consistent with the Musolino et al<sup>12,27</sup> studies that utilized the IAPCC-R© with PT students. Musolino et al<sup>27</sup> documented a difference in IAPCC-R© scores between PT students who did not participate in a series of cultural competence education

modules (control) and those that did participate in the modules. In addition, Musolino et al documented a significant increase in the cultural competence of student PTs as measured by the IAPCC-R© following participation in cultural competence education. Both of these findings support the responsiveness of the IAPCC-R© with PT students. It worth noting that the subjects in the Musolino et al study were similar to the current study, which may contribute to the comparable findings. The Musolino et al study included 36 first-year PT students, while the current study included 35 first-year PT students. There is one notable difference between the studies. In the Musolino et al study, the students participated in 4 modules, each lasting for 2 hours, for a total of 8 hours of instruction. In the current study, there was 1 module lasting for 4 hours, resulting in half the number of hours of instruction provided in the Musolino et al study. Even with half of the instruction hours, the IAPCC-SV© was responsive to changes in students' cultural competence.

The results of the current study are also similar to the Musolino et al<sup>12</sup> 3-year investigation with PT students. Musolino et al examined the effect of cultural competence education on the cultural competence of 82 PT students. In this study, students participated in 4 modules, each lasting for 2 hours, for a total of 8 hours of instruction. Again there was a significant increase in the PT students' cultural competence as measured by the IAPCC-R©, following participation in the cultural competence education, further supporting the responsiveness of the IAPCC-R© with PT students. Since the IAPCC-R© and IAPC-SV total scores are based on 2 different scales, it is not appropriate to compare the actual change in scores from pre-test to post-test between the Musolino et al<sup>12,27</sup> studies and the current study. However, the results of the Musolino et al studies and the current study are similar in that the respective instruments were responsive to a change in the cultural competence of the PT students following participation in cultural competence education.

In addition to being statistically significant, the results of the current study are clinically relevant as the Okere pilot study determined the minimal clinically important difference for the IAPCC-SV© is 4.6 points. In the current study, the difference in the adjusted scores was 7.29, well above the minimal clinically important difference. Therefore, the IAPCC-SV© is responsive to differences that are not only statistically significant but also clinically relevant for PT students. The IAPCC-SV© can potentially be used as an outcome measure to document the cultural competence of PT students. If it is to be used in this capacity, it is essential that the instrument is responsive to clinically relevant differences. The results of the current study suggest that the IAPCC-SV© is responsive to both statistically significant and clinically relevant differences in PT students, and provides preliminary support that the IAPCC-SV© is an appropriate instrument to document PT students' cultural competence.

### **Study III**

Study III investigated the ability of the cultural composite score and minority/majority status to predict the IAPCC-SV© score. It was hypothesized that the cultural composite score would predict IAPCC-SV© score and that majority/minority status, over and above cultural composite score, would predictor IAPCC-SV© score. As hypothesized, the cultural composite score was a significant predictor of IAPCC-SV© score and accounted for 22% of the variance in the IAPCC-SV© score. However, minority/majority status was not a significant predictor of IAPCC-SV© score, over and above the cultural composite score.

Previous studies have examined individual predictors of the IAPCC© and IAPCC-R© including the number of countries visited,<sup>15</sup> courses in cultural diversity,<sup>17,18</sup> experience working with patients of another culture,<sup>13,17,18</sup> ability to speak a foreign language,<sup>17</sup> and experience living in another country.<sup>15,17</sup> The current study was unique in that it utilized these individual predictors as well as other predictors to create a cultural composite score. Since the predictor variables



were not examined individually for their ability to predict IAPCC-SV© score, specific direct comparisons between the findings of previous studies and the current study cannot be made. However, general comparisons and observations can be made between the current and previous studies.

For the current study, 5 of the 7 cultural composite questions (#4, 5, 8, 9, 10) were based upon predictors utilized in previous studies to predict IAPCC© and IAPCC-R© scores.<sup>15,17,18</sup> In the current study, these predictors were not examined individually for their ability to predict IACPP-SV© score. Therefore, direct comparison of this study's results to the previous studies is not appropriate. Since the cultural composite score was a significant predictor of IAPCC-SV© score and was largely based upon previously examined predictors, there is indirect evidence to suggest that the current study's findings are consistent with previous studies' findings. However, it is not clear if the cultural composite scores' ability to predict the IAPCC-SV© score was primarily due to the previously studied predictors (#4, 5, 8, 9, 10) or the additional predictors (#6 and 7). Since the cultural composite score was a significant predictor of IAPCC-SV©, these predictors should continue to be studied either individually or as a composite score, for their ability to predict IAPCC-SV© score.

It was anticipated that the cultural composite score would predict IAPCC-SV© score. Generally speaking, the cultural composite questions focused on exposures to other cultures through personal experiences, travel/living in another country, and cultural diversity courses. However, the cultural composite does not ask the same type of questions as IAPCC-SV©. The cultural composite asks about the students' experiences whereas the IAPCC-SV© asks more specific questions about their awareness, knowledge, skills, encounters, and desires.<sup>3</sup> The students' experiences with other cultures can contribute to their cultural awareness and knowledge. The students' experiences with other cultures would also provide them with the opportunity to learn about cultural skills, encounters, and desire. Since the cultural composite

asks about experiences related to culture, it is not surprising that it is a predictor of the IAPCC-SV© which asks about more specific questions about their awareness, knowledge, skills, encounters, and desires.<sup>3</sup>

In addition to identifying that the cultural composite score as a predictor of IAPCC-SV© score, the current study identified that the cultural composite score accounted for 22% of the variance of IAPCC-SV©. The results of the current study can be compared to previous research. Kawashima<sup>17</sup> documented that the following variables accounted for the indicated amount of variance in the IAPCC-R© score: ability to speak a foreign language (4.3%), courses related to cultural nursing care (2.0%), experience in caring for culturally/ethnically diverse patients (2.4%) and length of time living overseas (1.5%). The current study utilized variables similar to those 4 variables as well as 3 other variables that accounted for a total of 22% of the variance in IAPCC-SV© score. Again, the differences in study designs do not permit direct comparisons between studies to be made. However, similar amounts of variance are accounted for in both studies that utilize these similar predictor variables, providing some support for the reproducibility of these results. Finally, since the PI did not identify any other published studies that have documented the IAPCC-SV©'s predictors, accounting for 22% of the score's variance was considered to be reasonable for an initial investigation of the instrument's predictors. Furthermore, since both the IAPCC-SV© and cultural composite are relatively new instruments, accounting for 22% of the IAPCC-SV© score's variance was considered to be reasonable for an initial investigation. As more research is performed on both instruments and improvements are made to both instruments, it is possible that the percent of the IAPCC-SV©'s variance accounted for by the cultural composite score will increase.

The current study did not identify majority/minority status as a significant predictor of IAPCC-SV© score over and above cultural composite score. Previous studies have investigated race and cultural competence.<sup>13,14</sup> There are two significant limitations of the previous research.

First, the number of studies that examined race and cultural competence using Campinha-Bacote's instruments<sup>3</sup> is limited. Second, although previous studies did support a difference in cultural competence related to race, the evidence was weak. There was enough evidence to warrant further investigation of race and cultural competence, but not enough strong evidence to definitively support a relationship. However, the existing evidence did support differences in cultural competence related to race.

Due to research design differences, direct comparison between the current study's results and those of previous studies should be made with caution. Fitzgerald et al<sup>14</sup> documented a significant difference in IAPCC-SV© scores between white and non-white nursing students, suggesting there is a difference in cultural competence between these groups. The current study did not identify majority/minority status as a predictor of IAPCC-SV© score, which appears to conflict with the results of the Fitzgerald et al<sup>14</sup> study. However, the current study design was different than the Fitzgerald et al<sup>14</sup> study in several important ways. First, the current study used majority/minority status as a predictor for IAPCC-SV© score; it did not compare IAPCC-SV© means between groups. Second, the current study did not use majority/minority status as a first order predictor; it used majority/minority status as a predictor over and above cultural composite score. The current study was conducted with PT students, not nursing students. Finally, the current study had a much larger sample size (n=273) and minority representation (30.4%) compared to the Fitzgerald et al<sup>14</sup> study (n=90, minority representation = 10.5%). Although the current study did not identify majority/minority status as a predictor of IAPCC-SV© score, it should be noted that the current study did not investigate if majority/minority status alone predicted IAPCC-SV© score. The current study identified that majority/minority status did not predict IAPCC-SV© over and above the cultural composite score. Therefore, the current study does not rule out the possibility that majority/minority status by itself may be a predictor of IAPCC-SV©

score. In conclusion, the current study neither supports nor conflicts with the Fitzgerald et al<sup>14</sup> study.

Wilbur<sup>13</sup> studied the cultural competence of nurse practitioner students. Race, among several other variables, was examined for its ability to predict IAPCC-R© score. Two variables did enter the regression equation, but race did not enter the regression equation over and above the 2 other variables. However, additional analyses compared IAPCC-R© scores of White, African American, and other race (Asian, Native Hawaiian, Other Pacific Islander) students. The global ANOVA was significant for differences in IAPCC-R© scores among groups; however, the post-hoc Scheffe analysis failed to find significant differences among groups. This finding suggests that either there was no difference among groups, or there may have been a difference but the post-hoc Scheffe just failed to identify the difference. There are some similarities between the Wilbur study and the current investigation. In the Wilbur study, race did not enter the equation over and above the other 2 variables which accounted for 24% of the variance in IAPCC-R© score. This finding is similar to the current study where majority/minority status did not predict IAPCC-SV© score over and above cultural composite score which accounted for 22% of the variance in IAPCC-SV© score. There are also some differences between the Wilbur<sup>13</sup> study and the current investigation. Wilbur<sup>13</sup> utilized the IAPCC-R© with nurse practitioner students while the current study utilized the IAPCC-SV© with PT students. In the Wilbur<sup>13</sup> study, 82.2% of the subjects were white, while the current study had a larger representation of minority students as only 69.6% of the students were white. The additional analysis of the Wilbur<sup>13</sup> study utilized both different statistical procedures as well as a different number of groups than the current study. The additional analysis of the Wilbur study compared IAPCC-R© means between 3 groups (White, African American, and other), while the current study only examined majority/minority status (2 groups) as a predictor over and above cultural composite score. This additional analysis result suggests that either there was no difference among groups, or perhaps there was a difference but



the post-hoc Scheffe just failed to identify the difference. Since the current investigation did not compare means between groups, the current investigation does not support, conflict, or clarify the findings of the Wilbur<sup>13</sup> study. Overall, the differences in instrumentation, subject characteristics, study design and analysis limit the comparison of the Wilbur study to the current investigation.

The current study does not support majority/minority status as a predictor of IAPCC-SV© score with PT students over and above the cultural composite score. Majority/minority status was anticipated to predict IAPCC-SV© score because it was thought that minority students, by the nature of being in the minority, would be exposed to other cultures more often than majority students. It was thought that this greater opportunity for exposure to other cultures would contribute to minority students having more cultural awareness, knowledge, encounters, and skills, all of which the IAPCC-SV© measures.<sup>3</sup> Closer examination of the questions that comprise the cultural composite score may account for majority/minority status not predicting IAPCC-SV© score, over and above the cultural composite score. Almost all of the cultural composite questions either explicitly or implicitly relate to the students' experiences with other cultures. Exposure to other cultures was the same reason that majority/minority was hypothesized to be a predictor of IAPCC-SV© score. It is possible that majority/minority status and the cultural composite score are measuring a similar construct to the extent that majority/minority status does not predict IAPCC-SV© score over and above the cultural composite score.

## **CONCLUSIONS**

Study I was an exploratory factor analysis of the IAPCC-SV© to examine the construct validity of the IAPCC-SV©. The exploratory factor analysis supported a 3 factor structure for the IAPCC-SV©. The factors included openness/desire, access/evaluation, and impact of culture on health. This study also provided limited support for the 5 constructs proposed by Campinha-Bacote.<sup>3</sup>

Study II examined the IAPCC-SV©'s responsiveness to change in the cultural competence of student physical therapists. The IAPCC-SV© was responsive to changes in the student physical therapists' cultural competence following participation in a cultural competence module.

Study III examined the predictors of IAPCC-SV© score. The cultural composite score was a significant predictor of IAPCC-SV© score, and accounted for 22% of the variability in IAPCC-SV© score. Majority/minority status was not a significant predictor of IAPCC-SV© score over and above cultural composite score.

## **LIMITATIONS**

There are several limitations for each component of this investigation as well as limitations for this investigation as a whole. The primary limitation of Study I, the exploratory factor analysis, was the nature of the analysis itself. Factor analysis is inherently subjective as multiple steps in the factor analysis can involve subjective decision making. Furthermore, exploratory factor analysis does not involve statistical hypothesis testing.<sup>16</sup> Instead, it simply examines the relationship between variables. Therefore, it is possible that the factor analysis identifies variables that have relationships with each other; however, those relationships may not translate into a clinically meaningful entity.

The primary limitation of Study II is that the subjects were not randomly selected from the population of Texas student physical therapists. Instead, they were a sample of convenience. Since these subjects were not randomly selected from the population of Texas student physical therapists, the results of this study cannot be extrapolated to all Texas student physical therapists. A second limitation is that since this study was conducted with Texas State student physical therapists, the results of this study cannot be extrapolated to student physical therapists in other states, physical therapist assistants, or other student healthcare professionals.

There were also several limitations for Study III, the regression analysis. The cultural composite score was a significant predictor of IAPCC-SV© score, however, this did not mean that there was a causal relationship between cultural composite score and IAPCC-SV© score. A third factor, that accounts for the relationship between cultural composite score and the IAPCC-SV© score, may exist. The second limitation is that the cultural composite score only accounted for 22% of the variance in IAPCC-SV© score. Although accounting for 22% of the variance IAPCC-SV© score is good for an initial investigation, overall it was still a low percentage of variability that was accounted for by the cultural composite score.

There are also several limitations for this investigation as a whole. The primary limitation is that the IAPCC-SV© is a self-report instrument. Therefore, student scores depend on how the students perceive themselves for each question and assumes the students answer questions honestly. However, students may perceive themselves as acting in one manner while patients may perceive the students as acting differently. In addition, students may not answer the questions honestly. Another limitation of this study is that it did not compare the cultural competence of students at different schools. It is possible that students' cultural competence may differ by school. Finally, this study did not compare means of minority/majority students, therefore, this study did not determine if there is a difference in cultural competence between majority and minority student PTs.

## **IMPLICATIONS**

Improving the cultural competence of student PTs is one of the current strategies for decreasing the health disparities of racial and ethnic minorities.<sup>2</sup> Documenting the properties of cultural competence assessment tools is the first step to identify student PTs' cultural competence. This investigation examined several properties of the IAPCC-SV© including its

construct validity, responsiveness, and demographic predictors. The results of this investigation have implications for both research and physical therapist education.

### **Implications for Research**

There is some evidence to support a 3 factor structure of the IAPCC-SV©. The presence of a factor structure supports the instrument's construct validity. It is necessary to establish an instrument's construct validity in order to determine if it is appropriate to use the instrument to conduct research. The results of this study provide preliminary support for the factor structure and therefore, the construct validity of the IAPCC-SV©. In addition, there is evidence to support the responsiveness of the IAPCC-SV©. In order to study the cultural competence of student physical therapists, outcome measures must be responsive to changes in cultural competence. The results of this study support the responsiveness of the IAPCC-SV©. Since the current study supports the construct validity and responsiveness of the IAPCC-SV©, it may be an appropriate instrument to measure student physical therapists' cultural competence in future research.

### **Implications for Physical Therapist Education**

The Commission for Accreditation in Physical Therapy Education requires that PT education programs prepare students to care for patients in a culturally competent manner.<sup>1</sup> In order for PT education programs to know if their education program is preparing students to treat patient in a culturally competent manner, instruments that measure cultural competence must be responsive to changes in students' cultural competence. The IAPCC-SV© was responsive to changes in student physical therapists' cultural competence. This finding supports the use of the IAPCC-SV© as an appropriate tool to measure student physical therapists' cultural competence. PT education programs can use the IAPCC-SV© as an outcome measure to document the cultural competence of students prior to and upon completion of their cultural competence

education. Therefore, the IAPCC-SV© can be used as an outcome measure to demonstrate compliance with CAPTE criteria.

While there is increasing evidence to support the IAPCC-SV©'s use with PT students, realistically, widespread use of the instrument may be cost prohibitive for PT programs. Identifying the IAPCC-SV©'s predictors may be a more cost effective method to measure the cultural competence of student PTs. The cultural composite score is an appropriate instrument to predict the IAPCC-SV© score. However, since the cultural composite score only accounted for 22% of the IAPCC-SV© score's variance, additional predictor variables will need to be examined to determine their ability to predict IAPCC-SV© score. In the future, measuring the cultural composite score and additional predictor variables may provide a cost effective method for PT education programs to measure the cultural competence of their students and demonstrate compliance with CAPTE criteria.

## **RECOMMENDATIONS FOR FUTURE RESEARCH**

Future research should be aimed at addressing the previously identified limitations. In order to determine if students are responding to the IAPCC-SV© honestly, an instrument that measures social desirability should be administered along with the IAPCC-SV©. The Marlow-Crowne<sup>40</sup> is a commonly used instrument that measures social desirability. Interpretation of the Marlowe-Crowne results along with the IAPCC-SV© results will allow researchers to determine if the students are responding to the IAPCC-SV© honestly, or in a socially desirable manner.

Since the IAPCC-SV© is a self-assessment tool, the results of the IAPCC-SV© should be studied in conjunction with other measures of cultural competence. Such measures can include cultural competence ratings from both clinical instructors and patients. The Physical Therapist Manual for the Assessment of Clinical Skills<sup>41</sup> (PTMACS) is a clinical performance instrument that is completed by the students and the students' clinical instructor and evaluates the students'



clinical performance. Cultural competence is one of the areas addressed by the PT MACS. The clinical instructor's rating of the PT student's cultural competence can be examined in conjunction with the student's self-rated cultural competence (IAPCC-SV© score). In addition, the patients' rating of the student's cultural competence could be measured and examined with the students self-rating as well as the clinical instructor's rating. Examining these 3 measures of cultural competence would determine if the students' perception of their own cultural competence is consistent with their clinical instructor's and their patients' perceptions.

Finally, future research should examine PT students' cultural competence following both the didactic and clinical portions of PT education. The current study examined the cultural competence of PT students following participation in a cultural competence education module. While the majority of the cultural competence education is delivered in that module, cultural competence education is incorporated throughout the didactic component of PT education. Therefore, it may be beneficial to measure the cultural competence of PT students upon completion of the entire didactic component of their education, not just upon completion of the cultural competence education module. In addition, PT students' cultural competence may be affected during the clinical component of their education. Therefore, it would also be appropriate to document PT student' cultural competence following the clinical component of their education.

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APPENDIX A

DEMOGRAPHIC SURVEY

### Demographic Information

Please answer all of the following questions.

1. Age (years): \_\_\_\_\_

2. Gender (circle one):

Male

Female

3. Which of the following best describes your race? Check all that apply

\_\_\_\_\_ African American

\_\_\_\_\_ American Indian or Alaska Native

\_\_\_\_\_ Asian

\_\_\_\_\_ Hispanic/Latino

\_\_\_\_\_ Native Hawaiian or Other Pacific Islander

\_\_\_\_\_ White (not Hispanic)

\_\_\_\_\_ Other

\_\_\_\_\_ Unknown

4. How many countries outside of the US have you traveled to? (circle one response)

0

1

2

3

4+

5. How many college courses in cultural diversity courses have you taken? (circle one response)  
(Language courses may be considered cultural diversity courses if they included instruction about the culture in addition to the language.)

0

1

2

3

4+

6. How would you rate your exposure to cultures different from your own PRIOR TO your undergraduate program (for example, but not limited to: personal relationships and experiences, work environment, community environment where you grew up, school environment for grades 0-12)? (circle one response)

no exposure  
occasional exposure  
regular exposure  
frequent exposure  
significant exposure

7. How would you rate your exposure to cultures different from your own DURING your undergraduate program (for example, but not limited to: personal relationships and experiences, work environment, community environment during your undergraduate program, school environment during your undergraduate program)? (circle one response)

no exposure  
occasional exposure  
regular exposure  
frequent exposure  
significant exposure

8. How would you rate your exposure to patients of cultures different from your own specifically during your physical therapy volunteer/work experiences? (circle one response)

no exposure  
occasional exposure  
regular exposure  
frequent exposure  
significant exposure

9. How well do you speak a language other than English? (circle one response)

I do not speak another language  
I can speak a little  
I can speak fairly well  
I can speak very well  
I can speak fluently



10. If you have ever lived in a country other than the United States, for how long did you live there? If you lived out of the country more than once, please indicate the total length of time. (circle one response)

Never lived in a country other than the United States

0-6 months

6-12 months

12-24 months

>24 months

**APPENDIX B**  
**PROFESSIONAL BEHAVIORS ASSESSMENT TOOL**

1. Critical Thinking						
Beginning Level		Intermediate Level			Entry Level	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Raises relevant questions</li><li>• Considers all available information</li><li>• Articulates ideas, understands the scientific method</li><li>• States the results of scientific literature but has not developed the consistent ability to critically appraise findings</li><li>• Recognizes holes in knowledge base</li><li>• Demonstrates acceptance of limited knowledge and experience</li></ul>		<ul style="list-style-type: none"><li>• Feels challenged to examine ideas</li><li>• Critically analyzes the literature and applies it to patient management</li><li>• Utilizes didactic knowledge, research evidence, and clinical experiences to formulate new ideas</li><li>• Seeks alternative ideas</li><li>• Formulates alternative hypotheses</li><li>• Critiques hypotheses and ideas at a level consistent with the knowledge base</li><li>• Acknowledges presence of contraindications</li></ul>			<ul style="list-style-type: none"><li>• Distinguishes relevant from irrelevant patient data</li><li>• Readily formulates and critiques alternative hypotheses and ideas</li><li>• Infers applicability of information across populations</li><li>• Exhibits openness to contradictory ideas</li><li>• Identifies appropriate measures and determines effectiveness of applied solutions efficiently</li><li>• Justifies solutions selected</li></ul>	

2. Communication						
Beginning Level		Intermediate Level			Entry Level	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Demonstrates understanding of the English language (verbal and written)</li><li>• Uses correct grammar, accurate spelling and expression, legible handwriting</li><li>• Recognizes impact of non-verbal communication in self and others</li><li>• Recognizes the verbal and non-verbal characteristics that portray confidence</li><li>• Utilizes electronic communication appropriately</li></ul>		<ul style="list-style-type: none"><li>• Utilizes and modifies communication (verbal, non-verbal, written and electronic) to meet the needs of different audiences</li><li>• Restates, reflects and clarifies message(s)</li><li>• Communicates collaboratively with both individuals and groups</li><li>• Collects necessary information from all pertinent individuals in the patient/client management process</li><li>• Provides effective education (verbal, non-verbal, written and electronic)</li></ul>			<ul style="list-style-type: none"><li>• Demonstrates the ability to maintain appropriate control of the communication exchange with individuals and groups</li><li>• Presents persuasive and explanatory verbal, written or electronic messages with local organization and sequencing</li><li>• Maintains open and constructive communication</li><li>• Utilizes communication technology effectively and efficiently</li></ul>	

3. Problem Solving						
Beginning Level		Intermediate Level			Entry Level	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Recognizes problems,</li><li>• States problems clearly</li><li>• Describes known solutions to problems</li><li>• Identifies resources needed to develop solutions</li><li>• Uses technology to search for and locate resources</li><li>• Identifies possible solutions and probable outcomes</li></ul>		<ul style="list-style-type: none"><li>• Prioritizes problems</li><li>• Identifies contributors to problems,</li><li>• Consults with others to clarify problems</li><li>• Appropriately seeks input or guidance</li><li>• Prioritizes resources (analysis and critique of resources</li><li>• Considers consequences of possible solutions</li></ul>			<ul style="list-style-type: none"><li>• Independently locates, prioritizes and uses resources to solve problems</li><li>• Accepts responsibility for implementing solutions</li><li>• Implements solutions</li><li>• Reassesses solutions</li><li>• Evaluate outcomes</li><li>• Modifies solutions based on the outcome and current evidence</li><li>• Evaluates generalizability of current evidence to a particular problem</li></ul>	
4. Interpersonal Skills						
Beginning Level		Intermediate Level			Entry Level	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Maintains professional demeanor in all interactions</li><li>• Demonstrates interest in patients as individuals</li><li>• Communicates with others in a respectful and confident manner</li><li>• Respects differences in personality, lifestyle and learning styles during interactions with all persons</li><li>• Maintains confidentiality in all interactions</li><li>• Recognizes the emotions and bias that one brings to all professional interactions</li></ul>		<ul style="list-style-type: none"><li>• Recognizes the non-verbal communication and emotions that others bring to professional interactions</li><li>• Establishes trust; seeks to gain input from others</li><li>• Respects role of others</li><li>• Accommodates differences in learning styles as appropriate</li></ul>			<ul style="list-style-type: none"><li>• Demonstrates active listening skills and reflects back to original concern to determine course of action; responds effectively to unexpected situations</li><li>• Demonstrates ability to build partnerships</li><li>• Applies conflict management strategies when dealing with challenging interactions</li><li>• Recognizes the impact of non-verbal communication and emotional response during interactions and modifies own behaviors based on them</li></ul>	
5. Responsibility						
Beginning Level		Intermediate Level			Entry Level	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Demonstrates punctuality</li><li>• Provides a safe and secure environment for patients</li><li>• Assumes responsibility for actions</li><li>• Follows through on commitments</li><li>• Articulates limitations and readiness to learn</li><li>• Abides by all policies of academic program and clinical facility</li></ul>		<ul style="list-style-type: none"><li>• Displays awareness of and sensitivity to diverse populations</li><li>• Completes projects without prompting</li><li>• Delegates tasks as needed</li><li>• Collaborates with team members patients, families</li><li>• Provides evidence based patient care</li></ul>			<ul style="list-style-type: none"><li>• Educates patients as consumers of health care services</li><li>• Encourages patient accountability</li><li>• Directs patients to other health care professionals as needed</li><li>• Acts as patient advocate</li><li>• Promotes evidence-based practice in health care settings</li><li>• Accepts responsibility for implementing solutions</li><li>• Demonstrates accountability for all decisions and behaviors in</li></ul>	

					academic and clinical settings	
<b>6. Professionalism</b>						
<i>Beginning Level</i>		<i>Intermediate Level</i>			<i>Entry Level</i>	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>Abides by all aspects of the academic program honor code and the APTA Code of Ethics,</li><li>Demonstrates awareness of state licensure regulations,</li><li>Projects professional image</li><li>Attends professional meetings</li><li>Demonstrates cultural/generational awareness, ethical values, respect, and continuous regard for all classmates, academic and clinical faculty/staff, patients families, and other health care providers</li></ul>		<ul style="list-style-type: none"><li>Identifies positive professional role models within the academic and clinical settings</li><li>Acts on moral commitment during all academic and clinical activities</li><li>Identifies when the input of classmates, co-workers and other healthcare professionals will result in optimal outcome and acts accordingly to attain such input and share decision making</li><li>Discusses societal expectations of the profession</li></ul>			<ul style="list-style-type: none"><li>Demonstrates understanding of scope of practice as evidenced by treatment of patients within scope of practice, referring to other health care professionals as necessary</li><li>Provides patient/family centered care at all times as evidenced by provision of patient/family education, seeking patient input and informed consent for all aspects of care and maintenance of patient dignity</li><li>Seeks excellence in professional practice by participation in professional organizations and attendance at sessions or participation in activities that further education/professional development</li><li>Utilizes evidence to guide clinical decision making and the provision of patient care, following guidelines for best practices</li><li>Discusses role of physical therapy within the healthcare system and in population health</li><li>Demonstrates leadership in collaboration with both individuals and groups</li></ul>	
<b>7. Use of Constructive Feedback</b>						
<i>Beginning Level</i>		<i>Intermediate Level</i>			<i>Entry Level</i>	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>Demonstrates active listening skills</li><li>Assesses own performance</li><li>Actively seeks feedback from appropriate sources</li><li>Demonstrates receptive behavior and positive attitude toward feedback</li><li>Incorporates specific feedback into behaviors</li><li>Maintains two-way communication without defensiveness</li></ul>		<ul style="list-style-type: none"><li>Critiques own performance accurately</li><li>Responds effectively to constructive feedback</li><li>Utilizes feedback when establishing professional and patient related goals</li><li>Develops and implements a plan of action in response to feedback</li><li>Provides constructive and timely feedback</li></ul>			<ul style="list-style-type: none"><li>Independently engages in a continual process of self evaluation of skills, knowledge and abilities</li><li>Seeks feedback from patient/clients and peers/mentors</li><li>Readily integrates feedback provided from a variety of sources to improve skills, knowledge and abilities</li><li>Uses multiple approaches when responding to feedback</li></ul>	



		<ul style="list-style-type: none"><li>• Reconciles differences with sensitivity</li><li>• Modifies feedback given to patients/clients according to their learning styles</li></ul>				
<b>8. Effective use of Time and Resources</b>						
<i>Beginning Level</i>		<i>Intermediate Level</i>			<i>Entry Level</i>	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Comes prepared for the day's activities /responsibilities</li><li>• Identifies resource limitations (i.e. information, time, experience)</li><li>• Determines when and how much help/assistance is needed</li><li>• Accesses current evidence in a timely manner</li><li>• Verbalizes productivity standards and identifies barriers to meeting productivity standards</li><li>• Self-identifies and initiates learning opportunities during unscheduled time</li></ul>		<ul style="list-style-type: none"><li>• Utilizes effective methods of searching for evidence for practice decisions</li><li>• Recognizes own resource contributions</li><li>• Shares knowledge and collaborates with staff to utilize best current evidence</li><li>• Discusses and implements strategies for meeting productivity standards</li><li>• Identifies need for and seeks referrals to other disciplines</li></ul>			<ul style="list-style-type: none"><li>• Uses current best evidence</li><li>• Collaborates with members of the team to maximize the impact of treatment available</li><li>• Has the ability to set boundaries, negotiated, compromise, and set realistic expectations</li><li>• Gathers data and effectively interprets and assimilates the data to determine plan of care</li><li>• Utilizes community resources in discharge planning</li><li>• Adjusts plans, schedule etc. as patient needs and circumstances dictate</li></ul>	
<b>9. Stress Management</b>						
<i>Beginning Level</i>		<i>Intermediate Level</i>			<i>Entry Level</i>	
1	2	3	4	5	6	7
<ul style="list-style-type: none"><li>• Recognizes own stressors</li><li>• Recognizes distress or problems in others</li><li>• Seeks assistance as needed</li><li>• Maintains professional demeanor in all situations</li></ul>		<ul style="list-style-type: none"><li>• Actively employs stress management techniques</li><li>• Reconciles inconsistencies in the educational process</li><li>• Maintains balance between professional and personal life</li><li>• Accepts constructive feedback and clarifies expectations</li><li>• Establishes outlets to cope with stressors</li></ul>			<ul style="list-style-type: none"><li>• Demonstrates appropriate affective responses in all situations</li><li>• Responds calmly to urgent situations with reflection and debriefing as needed</li><li>• Prioritizes multiple commitments</li><li>• Reconciles inconsistencies within professional, personal and work/life environments</li><li>• Demonstrates ability to defuse potential stressors with self and others</li></ul>	

10. Commitment to Learning						
<i>Beginning Level</i>		<i>Intermediate Level</i>			<i>Entry Level</i>	
1	2	3	4	5	6	7
<ul style="list-style-type: none"> <li>• Prioritizes information needs</li> <li>• Analyzes and subdivides large questions into components</li> <li>• Identifies own learning needs based on previous experiences</li> <li>• Welcomes and/or seeks new learning opportunities</li> <li>• Seeks out professional literature</li> <li>• Plans and presents an in service, research or case studies</li> </ul>		<ul style="list-style-type: none"> <li>• Researches and studies areas where own knowledge base is lacking in order to augment learning and practice</li> <li>• Applies new information and re-evaluates performance</li> <li>• Accepts that there may be more than one answer to a problem</li> <li>• Recognizes the need to and is able to verify solutions to problems</li> <li>• Reads articles critically and understands limits of application to professional practice</li> </ul>			<ul style="list-style-type: none"> <li>• Respectfully questions conventional wisdom</li> <li>• Formulates and re-evaluates position based on available evidence</li> <li>• Demonstrates confidence in sharing new knowledge with all staff levels</li> <li>• Modifies programs and treatments based on newly-learned skills and considerations</li> <li>• Consults with other health professionals and physical therapist for treatment ideas</li> </ul>	

APPENDIX C  
IRB APPROVALS



**Office of Research**  
6700 Fannin Street  
Houston, TX 77030-2343  
713-794-2480 Fax 713-794-2488

May 12, 2011

Ms. Suzanna Dougherty Okere  
School of Physical Therapy - P. Gleeson Faculty Advisor  
6700 Fannin Street  
Houston, TX 77030

Dear Ms. Okere:

*Re: "Construct Validity and Predictors of the Inventory for Assessing the Cultural Competence of  
Among Healthcare Professionals - Student Version(IAPCC-SV)" (Protocol #: 16679)*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

Sincerely,

*Carolyn Kelley*  
Carolyn Kelley, PT, DSc, NCS  
Institutional Review Board - Houston

APR 12, 2011

**TWU INSTITUTIONAL REVIEW BOARD (IRB)  
MODIFICATION REQUEST FORM**

Complete this form when you would like to request a change on an approved study. This change could be a change in the research team, data collection sites, protocol (e.g., compensation, study procedures, etc.), and/or the informed consent. Submit this signed form along with copies of any new or modified materials you describe below to the IRB. NOTE: You may not implement any changes to an IRB-approved study until your Modification Request has been approved.

**PRINCIPAL INVESTIGATOR:** Suzanna D Okere

**DATE APPROVED BY IRB (most recent):** July 21, 2010

**TITLE OF STUDY:** The Psychometric Properties of the Instrument for Assessing the Process of Cultural Competence Among Health Care Professionals-Student Version and the Effects of an Educational Module on the Cultural Competence of Student Physical Therapists

**Provide a detailed description of the modification(s) requested:**

First, I am requesting a change in the original title (see above) to 'The Effects of an Educational Module on the Cultural Competence of Student Physical Therapists.'  
I am requesting approval to study another cohort of 40 students physical therapists in Summer 2011. The subjects in the 2010 data collection were not separated into two groups - they all remained in one group (experimental group - cultural competence module). I am requesting approval to collect data on another cohort of 40 students in the Summer of 2011, and these students will be separated into two groups: experimental and control. The experimental group will participate in the same cultural competence module of the original study. The control group will participate in a professional behaviors module that is already part of the current curriculum. All students will be administered the IAPCC-SV just two times: pre and post module (as opposed to three times in the original study). I am requesting to collect demographic information (attached) about the subjects as well as have them complete a professional behaviors survey (attached) pre and post module. Completion of the professional behaviors survey is also already part of the current curriculum. Finally I am requesting an extension of the study period to December 2011. The study for the 2011 cohort is funded by a grant from the Texas Physical Therapy Foundation. Texas State University-San Marcos grant GPID #110154.

**Provide a list of any new or modified documents materials and attach these items to this form:**

Approval of IRB Change from Texas State University-San Marcos  
Informed Consent (modified)  
Professional Behaviors Survey  
Demographic Information



Principal Investigator Assurance: I certify that the revised information provided for this project is correct and that no other procedures or forms will be used. I confirm that no changes will be implemented until I receive written approval for the changes from the TWU IRB.

Suzanna O Okeke  
Signature of Principal Investigator

4/8/11  
Date

APPROVED:

Lump Kelly, PT  
Signature of IRB Chair / Co-Chair

4-15-11  
Date



**Institutional Review Board**

**Continuation/Change**

**Certificate of Approval**

**Applicant: Suzanna Okere**

**Original IRB Application Number : 2009R4601**

**Date of Approval: 04/08/11**

**Expiration Date: 04/07/12**

Assistant Vice President for Research  
and Federal Relations

Chair, Institutional Review Board



Institutional Review Board

Request For Exemption

## Certificate of Approval

Applicant: Suzanna Okere

Request Number : EXP2011K2339

Date of Approval: 04/08/11

A handwritten signature in cursive script, appearing to read "M. Blanda".

Assistant Vice President for Research  
and Federal Relations

A handwritten signature in cursive script, appearing to read "Jon Lane".

Chair, Institutional Review Board

APPENDIX D  
PERMISSION TO USE THE IAPCC-SV©



**J. Campinha-Bacote,**  
PhD., RN, CS, CNS, CTN, FAAN  
Transcultural Consultant

Date: May, 2 2011  
To: Ms. Suzanna Okere  
From: Dr. Josepha Campinha-Bacote  
President, Transcultural C.A.R.E. Associates  
RE: Letter of Permission for Limited Use of the IAPCC-SV

This letter grants permission to Ms. Suzanna Okere to use my tool, *"Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV)"* to assess the level of cultural competence of 272 physical therapy students in the state of Texas in the project, *"Construct validity, responsiveness, and predictors of the Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals - Student Version (IAPCC-SV,"* and for one copy to be submitted to Texas Woman's University with the study's prospectus. I have received \$2,184 for 273 tools for this study.

**TIME FRAME:** Permission to use the IAPCC-SV is time-limited to be used from May 10, 2011 through September, 2012. Upon October 1, 2012 all unused tools must be destroyed.

**ONSITE ADMINISTRATION:** This onsite permission only grants administration of the IAPCC-SV via an onsite pencil and paper administration, in Ms. Suzanna Okere hand-distributes the tool to each participant and then collects the tools immediately following its completion. Ms. Suzanna Okere agrees that the administration of the IAPCC-SV cannot be administered in an offsite format such as in on an online course, internal or external mailings, or via an Internet website offering.

**RESTRICTIONS OF COPYING:** Ms. Suzanna Okere agrees that the IAPCC-SV and any of its 20 items cannot be copied or reproduced for any other reason. This includes, but not limited to, being used in formal or informal publications or presentations, dissertation/thesis, hardouts for presentations, PowerPoint presentations or on an overhead transparency. The IAPCC-SV is only to be used in the above project in which it is administered to 272 physical therapy students in the pencil/paper format.

**PUBLICATIONS:** Ms. Suzanna Okere agrees that any publications (formal or informal) or presentations of the findings of the study using my tool will be shared with me.

Thank you for complying with the requests of using this copyrighted tool. Please contact me if you have any questions.

(513) 469-1664

[www.transculturalcare.net](http://www.transculturalcare.net)

11108 Huntwicke Place  
Cincinnati, Ohio 45241





Clinical, Administrative, Research  
& Educational Consultation  
in Transcultural Health Care

**J. Campinha-Bacote,**  
PhD, MAR, PMHCNS-BC, CTN-A, FAAN  
Transcultural Healthcare Consultant

Date: August 10, 2011  
To: Ms. Suzanna Okere  
From: Dr. Joseph Campinha-Bacote  
President, Transcultural C.A.R.E. Associates  
RE: Letter of Permission for Limited Use of the IAPCC-SV

This letter grants permission to Ms. Suzanna Okere to use my tool, "Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV)" to assess the level of cultural competence of 100 student physical therapists in the study, "Construct Validity, Responsiveness, and Predictors of the Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals - Student Version (IAPCC-SV)". I have received \$800 for 100 tools for this study.

**TIME FRAME:** Permission to use the IAPCC-SV is time-limited to be used between August 24, 2011 through September 10, 2011. Upon September 11, 2011 all unused tools must be destroyed.

**ONSITE ADMINISTRATION:** This onsite permission only grants administration of the IAPCC-SV via an onsite pencil and paper administration. The IAPCC-SV cannot be administered in an offsite format such as in an online course, internal or external mailings, or via an Internet website offering.

**RESTRICTIONS OF COPYING:** Ms. Suzanna Okere agrees that the IAPCC-SV and any of its 20 items cannot be copied or reproduced for any other reason. This includes, but not limited to, being used in formal or informal publications or presentations, dissertation/thesis, handouts for presentations, PowerPoint presentations or on an overhead transparency. The IAPCC-SV is only to be used in the above project in which it is administered to these 100 students in the pencil/paper format.

**PUBLICATIONS:** Ms. Suzanna Okere agrees that any publications (formal or informal) or presentations of the findings of the study using my tool will be shared with me. Thank you for complying with the requests of using this copyrighted tool. Please contact me if you have any questions.

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*I would appreciate the findings of the psychometric property (validity) of the IAPCC-SV.  
Thank you*

APPENDIX E  
INSTRUCTIONS

## **Instructions**

You are being asked to complete the included surveys as part of a research project that is examining the cultural competence of physical therapist students. Your participation is completely voluntary and your completion of the surveys will serve as your consent to participate. Your survey is completely anonymous – no identifying information is being asked of you, and therefore, none of your responses can be linked to you. You may choose not to answer any of the questions.

Please complete the following demographic sheet and the survey. Please mark all responses clearly. If you change your response, please make sure that you clearly negate the unwanted response and that you clearly indicate the desired response. There are no right or wrong answers to any of the questions – just answer the questions truthfully. Please review each question on the demographic sheet and the survey to confirm that you answered all questions that you intended to answer. Thank you for your participation.

APPENDIX F  
INFORMED CONSENT

TEXAS STATE UNIVERSITY-SAN MARCOS  
DEPARTMENT OF PHYSICAL THERAPY  
310B Health Professions Building, San Marcos, TX 78666, 512 245-8351

TEXAS STATE UNIVERSITY-SAN MARCOS  
CONSENT FORM TO PARTICIPATE IN RESEARCH

**Title: The Effects of an Educational Module on the Cultural Competence of Physical Therapist Students**

**Participating Researchers and Institutions:**

Investigator: Suzanna D. Okere, PT, MPT, SCS  
Clinical Assistant Professor  
Texas State University-San Marcos  
601 University Drive  
San Marcos, TX 78666  
512 245-3507

Advisor: Peggy Gleeson, PT, PhD  
Associate Professor  
Texas Woman's University  
6700 Fannin Street  
Houston, TX 77030  
713 794-2079

**Explanation and Purpose of the Research**

You are being invited to participate in a research study examining cultural competence among student physical therapists, because you are currently enrolled as a student physical therapist. This research study may be used to complete Suzanna D. Okere's doctoral dissertation. The purpose of this study is to determine the impact of an education module on the cultural competence of physical therapist students. This study currently funded by the Texas Physical Therapy Foundation.

**Research Procedures**

This entire study will take place at Texas State University-San Marcos, Health Professions Building. If you choose to take part in this study, you will first be administered a 20 question survey that asks questions about culture as it relates to physical therapy, a 10 question professional behaviors survey that asks about professional behaviors as it relates to physical therapy, as well as a demographic questionnaire. You will then be randomly assigned to one of two groups. You will participate in an educational module, lasting approximately four hours. It includes both lecture instruction and group discussion of case studies. At the conclusion of the module, you will retake the surveys, and you will be asked two additional questions. The total time commitment will be approximately five hours, including breaks and completion of the survey/additional questions. You may choose not to answer any question(s) for any reason during the study.

**Potential Risks**

There are some potential risks related to your participation in this study. You may experience fatigue as a result of participating in this study. To minimize fatigue, regularly scheduled breaks will occur throughout the study, with refreshments provided. In addition, you may also experience discomfort or embarrassment when discussing the potentially sensitive issues of culture and professional abilities as it relates to physical therapy. The module instructor will

Participant Initials

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**Title: The Effects of an Educational Module on the Cultural Competence of Physical  
Therapist Students**

make every effort to ensure personal comfort during instruction and discussion. If you feel physical or emotional discomfort at any time during the study, you may discontinue participation at any time without penalty. If you feel as though you need to discuss this emotional discomfort with a professional you may contact any of the mental health providers listed below. As the research participant, you would be responsible for covering any expenses associated with mental health services incurred as a result of participation in this study.

1. Texas State University Counseling Center 24 hour Crisis Hotline toll free at 1 877 466 0660 or for an emergency after business hours 512 245 2890. Mental health services at the Counseling Center are free to registered students, though the number of sessions allowed may be limited.
2. Hays County Crisis Hotline 512 396 3939
3. Capitol Area Mental Health Center 512 302 1000

Another potential risk to you as a result of your participation in this study is loss of confidentiality. Confidentiality will be protected to the extent that is allowed by law. A code number, rather than your name will be used on the surveys. Only Suzanna Okere's advisor, Dr. Peggy Gleeson, will have access to the document that links your name to your code number. Only the investigator, her committee, and a research assistant will have access to your survey. The surveys will be stored in a locked filing cabinet in the Department of Physical Therapy under the protection of Suzanna Okere and all electronic files will be password-protected on a laptop and a department computer. Within ten years, the surveys will be shredded with a cross-cut shredder and the electronic files will be deleted. It is expected that the results of this study will be presented in the investigator's doctoral dissertation and other research publications and presentations. However, no names or other identifying information will be included in any publication or presentation.

The researchers will try to prevent any problem that could happen as a result of your participation in this research. You should let the researchers know at once if there is a problem, and they will help you. However, Texas State University-San Marcos and Texas Woman's University does not provide medical services or financial assistance for injuries that may happen because you are taking part in this research.

**Participation and Benefits**

Your participation in this study is completely voluntary and you are free to withdraw your consent and your participation from this study at any time, without penalty, intimidation, prejudice or jeopardy to your standing with the University or the Department of Physical Therapy. The direct benefit of this study to you is that at the completion of this study, a copy of the study's results will be mailed to you if requested\* (see following page).

**Questions Regarding the Study**

You will be given a copy of this signed and dated consent form to keep. If you have any questions about this research study you should ask the researchers; their phone numbers are at

\_\_\_\_\_  
Participant Initials

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**Title: The Effects of an Educational Module on the Cultural Competence of Physical  
Therapist Students**

the top of this form. If you have any questions about the research, your rights as a research participant, and/or research-related injuries to participants you may contact the Texas State Institutional Review Board chair, Dr. Jon Lasser (512-245-3413 – [lasser@txstate.edu](mailto:lasser@txstate.edu)), or Ms. Becky Northcut, Compliance Specialist (512-245-2102) or Texas Woman's University Office of Research at 713-794-2480.

Participant's Signature \_\_\_\_\_ Date \_\_\_\_\_

The above consent form was read, discussed, and signed in my presence. In my opinion, the person signing said consent form did so freely and with full knowledge of its contents.

Signature of Investigator \_\_\_\_\_ Date \_\_\_\_\_

\*If you would like to receive a summary of the results of this study, please provide an address to which this summary should be sent:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The IRB approval number for this research study is : 2009R4601.

\_\_\_\_\_  
Participant Initials

Page 3 of 3

APPENIDX G

RECRUITMENT MEMO

**To: Texas PT program Clinical Education Coordinators**  
**Re: Okere Dissertation Study**

PT programs must demonstrate compliance with CAPTE criteria, and several CAPTE criteria address cultural competence in PT education. The *Blueprint for Teaching Cultural Competence in Physical Therapy Education* indicates the Campinha-Bacote model of cultural competence has been adopted as part of the framework for PT cultural competence education. The Inventory for Assessing the Process of Cultural Competence Among Healthcare Professionals-Student Version (IAPCC-SV©) is based upon the Campinha-Bacote model, and this instrument has been shown to have internal consistency and test-retest reliability with PT students. However, a factor analysis has not been performed with PT students for this instrument. In addition, predictors of cultural competence, as measured by the IAPCC-SV©, have not been documented for PT students.

The primary investigator, Suzy Okere, is a faculty member at Texas State University and she is currently pursuing her PhD at Texas Woman's University. This study will be the foundation for her doctoral dissertation. This study has received funding from the Texas Physical Therapy Foundation.

Your PT program is being asked to participate in a study that will perform:

1. a factor analysis of the IAPCC-SV© with PT students
2. A regression analysis of the IAPCC-SV© utilizing several demographic predictors

If you choose to participate, you will be asked to do the following (total time: approx 30 minutes).

1. Informed consent procedures in accordance with Texas State University-San Marcos and Texas Woman's University Institutional Review Boards. No identifying information will be requested at any time during this study.
2. Read aloud to the PT class a standard set of instructions. Distribute the IAPCC-SV© (20 questions, 15-20 minutes to complete) and a brief demographic questionnaire (approx 5-10 questions, 5-10 minutes to complete). Distribute to PT students (in classroom setting) in the first semester of the PT program, preferably during orientation, prior to ANY information related to cultural diversity being disseminated in the PT program.
3. Collect IAPCC-SV© and demographic questionnaire and mail back to Suzy Okere at Texas State University.

There is no cost to your program for participation in this study.

Please contact Suzy Okere directly at [sd11@txstate.edu](mailto:sd11@txstate.edu) or 512 245 3507 if you have any additional questions or are interested in participating in this study.