Factor analysis of the Condom Use Self-Efficacy Scale among multicultural college students

Thomas W. Barkley Jr and Jason L. Burns

Abstract

The Condom Use Self-Efficacy Scale (CUSES) was administered to 447 multicultural college students. The sample consisted of 63.5% Hispanic/Latino, 17.1% African-American, 13.7% Caucasian, 4.1% other and 1.6% Asian students. The obtained scores were subjected to a principal components factor analysis with a Varimax rotation. An item designation criteria was used and three distinct factors were extracted: (1) ‘Appropriation’, (2) ‘Sexually Transmitted Diseases’ and (3) ‘Partners’ Disapproval’. Comparisons to the only other published factor analysis of the CUSES are made. Implications for future research using the CUSES to design AIDS education curricula for multicultural college students are discussed.

Introduction

As one of the leading causes of death, HIV/AIDS has the greatest impact on young adults, particularly racial and ethnic minorities (Centers for Disease Control and Prevention, 1999; Chabon and Futterman, 1999). New cases of AIDS are expected to be diagnosed at the rate of 40,000–60,000 each year (Froman and Owen, 1997; Katzenstein, 1999; Shank and Pund, 1999) and half of all new HIV infections occur among individuals who are 25 years of age and younger (Centers for Disease Control and Prevention, 1998, 1999). Even though the number of individuals who are diagnosed with AIDS each year is declining, there has not been a comparable decline in the number of diagnosed cases among America’s youth (Centers for Disease Control and Prevention, 1999).

HIV is most commonly spread by sexual behavior (Centers for Disease Control and Prevention, 1999). After abstinence, the most effective method for preventing the spread of HIV is using a condom (Pinkerton et al., 1998). Reports indicate that college students and young adults generally have multiple sex partners and use condoms sporadically, if at all (Chabon and Futterman, 1999; Schuster, 1998; Centers for Disease Control and Prevention, 1999). Most college students are knowledgeable about the transmission of HIV and how to prevent it. However, as sporadic use of condoms indicates, students do not use this knowledge to protect themselves against HIV/AIDS (Mahoney, 1995; Serlo and Aavarinne, 1999). These findings precipitated the necessity for an instrument designed to identify specific areas which may be seen as barriers to condom use for college students. Until the development of the Condom Use Self-Efficacy Scale (CUSES), no such instrument existed (Brafford and Beck, 1991).

Conceptual framework

Self-efficacy is a construct which has gained recognition as a tool for facilitating positive behavioral change. Self-efficacy was derived from the Social Learning Theory of Bandura (Bandura, 1977). Bandura proposed self-efficacy as an important mediator of behavior and defined the concept as ‘a judgment of one’s capability to accomplish a
certain level of performance’ [(Bandura, 1986), p. 390]. Bandura (Bandura, 1977) suggests that a person with a high level of perceived self-efficacy is more likely to master particular behavior than an individual with a lower level of perceived self-efficacy.

Bandura (Bandura, 1977) identified four sources of self-efficacy. The sources are (1) performance accomplishment, (2) vicarious experiences, (3) verbal persuasion and (4) physiological arousal. Performance accomplishment is learning from previous personal experience where one has achieved mastery. Vicarious experiences may be viewed as opportunities to observe others, similar to oneself, performing a specific behavior. Verbal persuasion is the result of verbal feedback to the learner from one in an authoritative role. Finally, physiological arousal refers to physical feedback that individuals encounter when attempting a given task.

Bandura’s (Bandura, 1989) assertion that self-efficacy could be a useful tool in HIV reduction facilitated the development of the CUSES. The CUSES is a 28 item instrument designed to measure college students’ confidence in properly using condoms (i.e. purchasing, applying and disposing of condoms) and negotiating the use of condoms with a new sex partner (Brafford and Beck, 1991).

**Review of literature**

Research utilizing the CUSES can be found in five published studies (Brafford and Beck, 1991; Brien et al., 1994; Langer et al., 1994; Mahoney et al., 1995; Forsyth et al., 1997). The developers of the scale, Brafford and Beck (Brafford and Beck, 1991), report that the CUSES is a reliable measure with a Cronbach’s $\alpha$ of 0.91 and a 2 week test–retest reliability of 0.81. Brafford and Beck (Brafford and Beck, 1991) also found acceptable levels of discriminant validity and convergent validity for the instrument. Forsyth et al. (Forsyth et al., 1997) reported that the CUSES possessed adequate internal consistency and that individuals’ attitudes about condoms were correlated with the overall score on the scale. Forsyth et al. (Forsyth et al., 1997) and Langer et al. (Forsyth et al., 1994) reported that condom use self-efficacy and actual condom use skill may be two separate constructs. These claims are based on the observation that college students often report being able to use a condom properly, but when asked to actually demonstrate proper use, students are unable to successfully perform the task.

In the only published factor analysis of the CUSES, Brien et al. (Brien et al., 1994) reported results which bolstered the claims of Brafford and Beck by supplying additional data on the discriminant validity of the scale. The study provided further evidence that the CUSES has sound psychometric properties, including internal consistency and freedom from bias based on social desirability. The four factors extracted from this factor analysis were labeled (1) ‘Mechanics’, (2) ‘Partner’s Disapproval’, (3) ‘Assertive’ and (4) ‘Intoxicants’. The researchers used a convenience sample of college students, as does the current study; however, it is important to note that information regarding the ethnic composition of the sample was not reported. Therefore, the purpose of this study was to perform a factor analysis among a culturally diverse convenience sample of college students to ascertain if factorial validity of the CUSES could be supported among this population.

**Method**

**Participants**

Four hundred and ninety (490) college students volunteered to participate in the study. Of these volunteers, 477 completed the instrument. The convenience sample consisted of students from a large, inner-city community college in a major city in south Florida. This setting was particularly chosen to obtain a sample of multicultural college students from a state which ranks third in the nation for the prevalence of AIDS and from a county where more than 30 000 people are currently infected with HIV (Centers for Disease Control and Prevention, 1997).

**Instrumentation**

The CUSES is a 28 item self-report questionnaire which elicits responses using a five-point Likert
scale format, ranging from ‘strongly disagree’ to ‘strongly agree’. Each of the responses is scored as follows: ‘strongly disagree’ = 0, ‘disagree’ = 1, ‘undecided’ = 2, ‘agree’ = 3 and ‘strongly agree’ = 4. After reversing for negatively worded items, scores are summed. The possible range of scores is 0–112, with higher scores indicating greater condom use self-efficacy (Brafford and Beck, 1991).

A compilation of items used in previous studies (Brafford and Beck, 1991; Jemmott et al., 1992; Barkley and Pittman, unpublished data) titled Personal Data was used to obtain demographic data. The SAS program was used to conduct the factor analysis of the CUSES.

Procedure

The CUSES was administered to participants enrolled in 13 sections of an introductory psychology course at a major community college in south Florida during classroom time. The classes were selected due to the inclusion of HIV/AIDS objectives as a predetermined component of the course curriculum. The CUSES was administered before formal education was presented on HIV/AIDS to ensure that knowledge gained during the course did not affect responses made by the participants.

Results

After administering and scoring the CUSES, the data were subjected to a principal components factor analysis with a Varimax rotation. A list-wise deletion resulted in the exclusion of 13 cases due to missing data. Thus, 447 cases were used in this study. Of the 447 participants, 49.4% (n = 220) were male and 50.6% (n = 225) were female. Two students did not report gender. Ethnicity of the sample included: 63.5% Hispanic/Latino (n = 282), 17.1% African-American (n = 76), 13.7% Caucasian (n = 61), 4.1% other (n = 18) and 1.6% Asian (n = 7).

The analysis resulted in the extraction of six factors with Eigenvalues greater than 1.0. However, some items correlated equally with more than one factor and some factors contained less than two items. To reduce the instrument to a simple factor structure and similar to the factor analysis conducted by Brien et al. (Brien et al., 1994), an item designation criteria was utilized. The selected designation rule requires that an item have a factor loading of 0.45 or higher on the designated factor and a loading of less than 0.35 on all other factors. The designation rule also stipulates that a factor be eliminated if less than three items being assigned to the factor do not meet these criteria. In accordance with this rule, three distinct factors emerged from the analysis (see Table I for items and factor loadings). The use of the inclusion criteria eliminated 18 of the 28 items on the scale. All factors extracted had Eigenvalues greater than 1.5 and, together, accounted for more than 48.2% of the variance in the CUSES.

The first factor included four items dealing with the acquisition and use of a condom. The factor was, therefore, labeled ‘ Appropriation’. The factor showed acceptable reliability with a Cronbach’s $\alpha$ of 0.76. Three items loaded on factor two. These items appear to be related to the stigma associated with sexually transmitted diseases (STDs). One item loading on this factor addresses the stigma of past homosexual experience, but the wording of the statement may be more indicative of the stigma connected to having AIDS. Because the other two items explicitly address STDs, the second factor was labeled ‘STDs’. The factor possessed good internal consistency with a Cronbach’s $\alpha$ of 0.83. Each of the three items loading on the third and final factor concerned college students’ partners’ feelings about condoms. The inclusion of a reference to ‘partner’s feelings’ in all the items loading on this factor resulted in the label ‘Partner’s Reaction’. This factor was also reliable (Cronbach’s $\alpha = 0.66$).

Discussion

The literature reveals that this is the first report designed to validate the factorial structure of the CUSES among a multicultural college student population. As previously noted, the only other attempt to extract factors from the CUSES did not
Table I. Items in each factor and factor loading

<table>
<thead>
<tr>
<th>Factor</th>
<th>Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1: Appropriation</td>
<td>I feel confident in my ability to put a condom on myself or my partner</td>
<td>0.749</td>
</tr>
<tr>
<td></td>
<td>I feel confident I could purchase condoms without feeling embarrassed</td>
<td>0.649</td>
</tr>
<tr>
<td></td>
<td>I feel confident I could remember to carry a condom with me should I need one</td>
<td>0.612</td>
</tr>
<tr>
<td></td>
<td>I feel confident I could gracefully remove and dispose of a condom after sexual intercourse</td>
<td>0.563</td>
</tr>
<tr>
<td>Factor 2: STDs</td>
<td>I would not feel confident suggesting using condoms with a new partner because I would be afraid he or she would think I’ve had a past homosexual experience</td>
<td>0.720</td>
</tr>
<tr>
<td></td>
<td>I would not feel confident suggesting using condoms with a new partner because I would be afraid he or she would think I have a sexually transmitted disease</td>
<td>0.864</td>
</tr>
<tr>
<td></td>
<td>I would not feel confident suggesting using condoms with a new partner because I would be afraid he or she would think I thought they had a sexually transmitted disease</td>
<td>0.799</td>
</tr>
<tr>
<td>Factor 3: Partner’s Reaction</td>
<td>If I were to suggest using a condom to a partner, I would feel afraid that he or she would reject me</td>
<td>0.733</td>
</tr>
<tr>
<td></td>
<td>If I were unsure of my partner’s feelings about using condoms I would not suggest using one</td>
<td>0.653</td>
</tr>
<tr>
<td></td>
<td>If my partner and I were to try to use a condom and did not succeed, I would feel embarrassed to try to use one again (e.g. not being able to unroll condom, putting it on backwards or awkwardness)</td>
<td>0.583</td>
</tr>
</tbody>
</table>

report the ethnicity of the sample (Brien et al., 1994). The factors in the current research labeled ‘Appropriation’ and ‘Partner’s Reaction’ are closely linked to those labeled by Brien et al. (Brien et al., 1994) as ‘Mechanics’ and ‘Partner Disapproval’, respectively. The exclusion of the factors labeled ‘Intoxicants’ and ‘Assertive’ from the present analysis may indicate that cultural diversity exists where factors associated with condom use self-efficacy are concerned rather than calling into question the factorial validity of the scale. For example, being assertive about the use of condoms may be more or less important to different cultural groups.

Three of the four sources of self-efficacy posited by Bandura (Bandura, 1977), performance accomplishment, verbal persuasion and physiological arousal, are represented by the factors which were extracted. The extraction of factors representing three of the four components of self-efficacy in Social Learning Theory provides further support for the instrument’s conceptual adequacy. The ‘Appropriation’ factor could be interpreted as the performance accomplishment component of self-efficacy. The students’ participation, or lack of participation, in purchasing and properly using condoms may represent their level of self-efficacy in regard to performing such behaviors. The ‘STDs’ factor is indicative of the physiological feedback component of self-efficacy. Each of the items in this factor refer to being ‘afraid’ and fear may be considered a state of physiological arousal. The third and final factor, ‘Partner’s Disapproval’, may be seen as a combination of both the physiological arousal and verbal persuasion components. For example, the student may be afraid of his/her partner’s disapproval and may also be verbally persuaded that using a condom is not necessary.

It should be noted that one limitation of the current study is the use of a convenience sample which is largely Hispanic/Latino. The results of the research may not generalize to populations which are not predominantly Hispanic/Latino. Future research should strive to balance the number of students representing various cultural aggregates.

A noteworthy strength of the study is the large sample which primarily represents three cultural groups: Hispanic/Latinos, African-Americans and Caucasians. While the current sample was largely Hispanic/Latino, the cultural diversity in the sample is greater than would be seen in the general
population of college students according to the US Census Bureau (US Census Bureau, 1998). The Census Bureau reported that the population of college students up to 24 years of age is 81% Caucasian, 11% African-American and 8% Hispanic origin; other groups including Asians and Native Americans were not reported. A major strength of the analysis is that it contributes to the little that is known about the differences in condom use self-efficacy which exist between cultural groups on multicultural college campuses. In addition, the study focuses on the age group which is at greatest risk for HIV acquisition. Finally, the study completes the task of factor analysis to "simplify the description of a complex set of behaviors" (Anastasi and Urbina, 1997, p. 128), while findings support the theoretical framework from which the CUSES was constructed.

Acknowledgements

The authors gratefully acknowledge Dr Irene Lipof, Director of Teaching/Learning at Miami Dade Community College, for her efforts in arranging data collection. The authors also thank Mr Andy Lightbourne, Department of Computer Services, and Dr Mark Faust, Department of Psychology at the University of South Alabama, for their assistance with data entry and manipulation. This research was supported in part by a grant from the University of South Alabama Research Council, Mobile, AL.

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Received on October 16, 1998; accepted on January 17, 2000