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Challenging the Empirical Utility of the Color-Blind Racial Attitudes Scale: Revisiting Factor Structure Across Race/Ethnicity and Gender Through Measurement Invariance

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Abstract

The Color-Blind Racial Attitudes Scale (CoBRAS) is the most commonly used scale to measure domains of color-blind racial ideology (CBRI). CBRI broadly refers to the denial of racism on individual and societal levels. The factor structure of CoBRAS has yet to be rigorously tested to confirm the replicability of the factor structure and demonstrate measurement invariance across multiple groups. This study examined the factor structure, internal consistency reliability, and measurement invariance of the CoBRAS across race/ethnicity and gender in 911 diverse college students. Confirmatory factor analysis (CFA) and measurement invariance of the CoBRAS were tested across race/ethnicity (Black, Latinx, and White) and male/female gender. Findings from the CFA indicated that previously published models did not fit these data. Following splitting the sample, an exploratory factor analysis (EFA) suggested a two-factor, 20-item CoBRAS was a more appropriate for these data, however, model modification was needed to improve model fit. A modified two-factor, six-item CoBRAS demonstrated reasonable model fit across both samples. Results from measurement invariance testing indicated that the new CoBRAS model achieved configural but not scalar invariance across race/ethnicity and gender. Differing levels of partial scalar invariance were found across groups. These findings suggest caution when comparing CoBRAS scores across groups. Future research is needed to determine the replicability of this factor structure and the measurement invariance across racial/ethnic groups and gender.

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Introduction

Color-blind racial ideology (CBRI) represents a collection of beliefs around the legacy of racism in United States (U.S.), including the belief that U.S. society is "postracial" and the election of former President Obama meant that our society had "transcended race" (Neville, Awad, Brooks, Flores, & Bluemel, 2013). This is surely not the case; the increase in media exposure of police brutality against Black, Indigenous, and People of Color (BIPOC), incidence of anti-Asian and Asian American violence, and the widening health inequities at the hands of the COVID-19 pandemic alone are significant sources of evidence that racism is alive and thriving within U.S. communities (Bonilla-Silva, 2020). Still, CBRI remains the dominant racial ideology in the U.S., which continues to perpetuate the denial of racial inequities and existence of systemic racism (Bonilla-Silva, 1996, 2020; Neville, Lilly, Lee, Duran, & Browne, 2000). The impact of CBRI on individuals holding one or more marginalized identities is arguably unique and multilayered, yet the quantitative measurement of CBRI has yet to be rigorously tested for measurement invariance to ensure equivalence across multiple groups. As the United States continues to diversify, this is a matter vital to psychological science because of its relevance not only to the overall well-being of people, but the efficacy of education, interventions and assessment tools used by psychologists to make inferences about psychological phenomena and their societal impact across varying intersections of identity.

CBRI is described as a major component to racism, serving to maintain health disparities and is a barrier to social justice by asserting that "humans are humans" and race does not matter (Bonilla-Silva, 2014; Neville et al., 2013).While CBRI is indicative of the mainstream societal worldview about racism, color-blind racial attitudes represent the expression of CBRI at the level of the individual (e.g., racist beliefs). The Color Blind Racial Attitudes Scale (CoBRAS; Neville et al., 2000) has been used to measure the individual level manifestation of CBRI. While holding color-blind racial attitudes has disparate effects across racioethnic groups, the effects also differ at various levels of CBRI. For example, it has been found that people of color who adopt higher levels of color-blind racial attitudes are more likely to internalize racist beliefs and have worse mental health outcomes (Neville et al., 2013). For non-Latinx White individuals, those who adopt color-blind racial attitudes are more likely to demonstrate higher levels of racial bias and racial fear as well as lower levels of empathy towards people of color (Neville et al., 2013). Gender differences in color-blind racial attitudes have also been found (Neville et al., 2000). With racial and ethnic minority populations growing at steeper rates than non-Latinx White populations, it stands to reason that CBRI, at the societal and individual level, will continue to morph and adapt in response to societal changes (Neville et al., 2013; 2000). Accordingly, reevaluating the psychometric properties of the CoBRAS will facilitate advancement of the field and broaden the ability to utilize the concept of CBRI empirically to positively impact health equity as it has potential to inform individual level interventions as well as systemic level change (e.g., policy).

Racism and Color-Blind Racial Ideology

The definition of racism has maintained similar elements over time. More recently, this definition has shifted to clarify that racism is a collection of beliefs around imagined genetic differences across race that serve to maintain a White racial dominance

(Bonilla-Silva, 1996; van den Berghe, 1967). While the prevailing conceptual framework of racism in social psychology depicts a cycle of ideas or beliefs that lead individuals to develop prejudices which influences behaviors and actions towards disadvantaged social groups (e.g., discrimination), there are also important structural and social conceptualizations of racism to recognize that have not been well represented in mainstream psychological science and are important to enhance understanding of CBRI at the individual level. Racism, from a sociological perspective, is a “combination of prejudice and power that allows the dominant race to institutionalize its dominance at all levels in society,” (Bonilla-Silva, 1996, p. 466). Other related perspectives, like the internal colonial perspective, conceptualize racism as a system in which the dominant racial group (e.g., non-Hispanic White) seeks to continue to raise its social position through a process of systematic oppression of ethnic minority groups in order to maintain social advantages (the products of colonization; Barrera, 1979; Blauner, 1972; Bonilla-Silva, 1996; Moore, 1970).

These varying but related definitions of racism are relevant as they aid in explicating how CBRI fits within these conceptualizations and modern racism theory. Initially, modern racism theory received the majority of the attention of the field and had the most psychometric backing in the literature (e.g., Modern Racism Scale; McConahay, 1986). Modern racism theory postulates that individuals who have high levels of racial prejudice hold modern racist beliefs such as believing that racism is no longer an issue, that Black people are excessively assertive about their rights, and that they use “unfair tactics” to achieve undeserved gains (Bonilla-Silva, 2014; McConahay, 1986; Neville et al., 2000). According to modern racism theory, individuals who hold racist beliefs in modern times would deny that they held any kind of racial prejudice. Some argue, however, that modern racism theory is limited in that it does not sufficiently account for what could be called "ultramodern" racism or the next evolution of racism because it does not adequately reflect the diversification of society and more subtle racist beliefs (McConahay, 1986). This is true, in part, because the theory and measurement focus on the Black societal context does not account for colorism and other factors that may be experienced by individuals from other racioethnic groups. Accordingly, CBRI has received more attention in the recent literature because it addresses this more current form of racism, "ultramodern racism", and has a broadened focus to other oppressed racial/ethnic groups (McConahay, 1986; Neville et al., 2013).

While some elements of CBRI and modern racism theory overlap, they are distinct constructs. Where modern racist beliefs include thinking "racism is a thing of the past" and a false sense that Black people are too aggressive in their pursuit of equal rights (McConahay, 1986), individuals who hold color-blind racial attitudes deny present day racism and racial disparities (Neville et al., 2013). CBRI is encompassed by two key elements –color evasion and power evasion (Bonilla-Silva, 2014; Frankenberg, 1993; Neville et al., 2000). Color evasion includes implicit and explicit efforts to not "see" race which often goes hand in hand with denying that White individuals possess a dominant social position in society. The other important concept subsumed under CBRI, power evasion, is the notion that any failure on the part of a person of color is due to something inherent within them and not because they were not afforded the same opportunities as people from other groups (e.g., denial of structural racism and how that might impact educational attainment). At face value, the desire to live in a world where everyone has equal opportunity is a great aspiration. However, research has shown that individuals who hold high levels of color-blind racial attitudes (and belief in a just world) are more likely to be perpetrators of racially insensitive behaviors, have higher levels of racial prejudice, and are less likely to work toward social justice (Neville et al., 2013).

In the 1997 pamphlet entitled *Can –or Should –America Be Color-Blind?*, the American Psychological Association (APA) reported the dangers of color-blind approaches and reminded its audience of the harms involved in attempts to ignore race (e.g., increased racial prejudice and discrimination). More recent statements by the APA have clarified that racial discrimination, which includes color-blind approaches, is considered a human rights violation and it called upon its membership to educate themselves and the public on these matters (APA, Presidential Task Force on Preventing and Promoting Diversity, 2012). Further, there is mounting evidence to support arguments in line with the APA's call to recognize that *race matters* and we must not ignore the harmful effects of racism by way of racial color-blindness that manifest in many layers of U.S. society. Salient examples of this include the overrepresentation of racial and ethnic minorities, specifically American Indian/Alaska Native, Blacks and Latinos, in poverty and findings that young children are less sensitive to racial discrimination when exposed to color-blind approaches in the classroom (Neville et al., 2013).

The Color-Blind Racial Attitudes Scale (CoBRAS)

Scale Development

The Color-Blind Racial Attitudes Scale (CoBRAS) is an instrument designed to measure the extent to which an individual is unaware of racism (Neville, Lilly, Lee, Duran, & Browne, 2000). The CoBRAS has also been described as measuring the extent to which an individual *denies* the existence and impact of racism. As previously mentioned, the CoBRAS was inspired by the CBRI literature and developed as a means to study ultramodern racist beliefs that cause harm (*see* Neville et al., 2013). The CoBRAS came out of Neville and colleagues (2000) work to empirically investigate the impact of workshops on racial attitudes and racism. This was also a time when ongoing public education efforts, such as President Clinton's Initiative on Race, were being directed towards increasing knowledge about racism and its impact on health inequities (Neville et al., 2013, 2000). An interdisciplinary research team initially drafted seventeen original items that were subsequently reviewed by race scholars and experts in psychometrics. After several additional rounds of review, reversing the wording of certain items to protect against response bias, and assessing reading level of the measure, the factor structure of a 26-item scale was evaluated. Using a multiple sample approach to validating the scale and evaluating its reliability, it was eventually determined that 20 items should be retained and a three-factor solution yielded the most intelligible structure for the CoBRAS (Neville et al., 2000).

Factor Structure

The initial factor structure and reliability estimates for the CoBRAS yielded an orthogonal three factor solution that accounted for 45% of the variance (Neville et al., 2000). Neville and colleagues (2000) concluded that the three-factor solution yielded the most robust factor structure and was conceptually interpretable as compared to solutions with two-, four- and five-factors. Of note, the authors indicated that both an oblique and orthogonal rotation yielded the same three-factor model. The majority of the variance was accounted for in the first factor, unawareness of racial privilege (URP; 31%), whereas the second and third factors accounted for an additional 8% (unawareness of institutional discrimination; UID) and 6% (unawareness of blatant racism; UBR) of the variance, respectively. Cronbach's alpha coefficients for each of the subscales and the total score were found to range from adequate to optimal (URP = .83; UID = .81; UBR = .76; total CoBRAS = .91). Further, CoBRAS scores were found to be positively correlated with scores of modern racism (indicating convergent validity) and negatively correlated with scores of social desirability (suggestive of divergent validity; Neville et al., 2000).

Even though the initial validation utilized multiple samples to empirically investigate the utility of the measure, on average, the majority of the participants were non-Hispanic White (see Table 1 for a comparison to the current study). Additionally, the sample sizes across racioethnic group were below what some consider the recommended convention (200 participants per subgroup) or five to ten observations per variable for factor analysis (Hair, Black, Babin, Anderson, & Tatham, 2006; Kline, 2011). In a more recent examination of the factor structure of the CoBRAS in a diverse Asian American community sample, the oblique (correlated) solution was tested against three models (orthogonal three-factor, one-factor, and a bifactor model; Keum, Miller, Lee, & Chen, 2018) across gender and generational status. Keum and colleagues' (2018) findings indicated that a bifactor model provided better fit of the factor structure of the CoBRAS and that the variance accounted for by the three subscales became minimally reliable when first accounting for the variance accounted for by all of the items (e.g., general factor). This suggests that if researchers desire to investigate the subscales, the variance of the total CoBRAS score will need to be partitioned out so as to not attribute variance to the subscales that would best be accounted for by the general factor variance. One way to accomplish this statistically is to specify use of a bifactor model in structural equation modeling.

Keum et al.'s (2018) findings suggest the possibility that the concept of CBRI may be best explained by a general factor model in other racioethnic groups in addition to Asian Americans. This warrants further investigation. Interestingly, even the authors of the scale posit that the CoBRAS and concept of color-blindness warrants ongoing investigation as modern day racism evolves and the availability of more diverse samples emerge (Neville et al., 2013).

Empirical Utility of the CoBRAS

The CoBRAS has been used to measure color-blind racial attitudes to test it as a predictor of other constructs in a few domains within the literature. In college student populations, the CoBRAS has been used to predict perceptions of both general and racial campus climate, where individuals with greater CoBRAS scores evidenced perceptions that it was acceptable for one social group to be more dominant over the other (e.g., social dominance orientation) and rated their campus climate more favorably than those with lower CoBRAS scores (Worthington, Navarro, Loewy, & Hart, 2008). The CoBRAS has also been found to predict the type of messages that Black American children receive from their parents about racism (e.g., parent racial socialization strategies; Barr & Neville, 2008). Relatedly, color-blindness has been found to explain part of the relation between parental racial socialization strategies, neighborhood composition, and friend group composition on mental health for Black college students at a predominantly White University in the Midwest (Barr & Neville, 2014). Further, higher CoBRAS scores in Black college students were found to exacerbate the effects of mainstream messages about racism and racial stereotypes (e.g., that race is no longer important in our society; Barr & Neville, 2014), resulting in greater self-reported psychological distress.

There is convincing evidence that the CoBRAS has utility with respect to evaluating the competency of clinical and counseling psychology trainees. For example, one study found that color-blind racial attitudes had a significant impact on how White clinical psychology trainees evaluated the symptom presentation of two clients, one Black and one White, differently when given the same fictitious report for each client (Gushue, 2004). The findings of this study support theoretical models that postulate that individuals use different reference points or anchors while making subjective judgments about other people depending on their social identity resulting in an implicit shifting of standards (or symptom thresholds) for members of different groups (Biernat & Manis, 1994). Further investigation of these data evidenced an interaction between client reported race and clinician color-blind racial attitudes (split into low, medium and high values) on perceived symptom severity such that student clinicians who held greater color-blind racial attitudes were more likely to assign higher ratings of pathology to their Black clients while clinicians that held low color-blind racial attitudes were more likely to rate the same client as significantly less symptomatic than the White client. Of note, color-blind racial attitudes were not found to impact perceptions of symptom severity of a White client. These findings have major implications for clinical training.

In studies using the CoBRAS as a predictor, researchers have categorized racial and ethnic minority (REM) participants differently. While some studies compared group differences between White and REMs collapsed into one group (Worthington, Navarro, Lowey, & Hart, 2008), others examined one racial group alone (e.g., Black college students; Barr & Neville, 2008; Barr & Neville, 2014) or group differences between two or more REM groups (Oh, Choi, Neville, Anderson, & Landrum-Brown, 2010). Even though each approach has made significant contributions to the fields' collective understanding of the impact of holding varying levels of color-blind racial attitudes, there still remains a dearth in the literature with respect to empirically supporting that the construct holds the same meaning across different social groups and whether similar levels of colorblindness manifest similarly (or differently) across groups (e.g., affective, behaviors). This impacts the ability to make inferences about how this influences behavior and might inform training and policy efforts.

Further, empirical studies using the CoBRAS evidence that ethnoracial groups differ in levels of CBRI. It has been consistently found that White individuals hold higher levels of color-blind racial attitudes overall suggesting less awareness (more denial) of racism for individuals from this group (Awad, Cokley, & Ravitch, 2005; Neville et al., 2000; Oh et al., 2010; Worthington et al., 2008). Research examining CBRI in Black college students have found that those who endorse high levels of CBRI are more likely to blame their own racial group for inequities and are more likely to associate with White college students than peers from their same racial/ethnic group (Bonilla-Silva & Dietrich, 2011; Neville, Coleman, Falconer, & Holmes, 2005). There is also evidence to suggest that levels of CBRI differ both between and within racioethnic groups; however, more evidence is needed to better understand the complex relationship between CBRI and race/ethnicity (Neville et al., 2013). It is imperative that research studies recruit samples that are representative of the general population, at a minimum, and/or oversample racioethnic minority participants to obtain adequately powered results to examine differences across subgroups.

While the U.S. Department of Health and Human Services (2002) established standards for utilizing both gender and racially diverse samples in intervention research (Williams, Tellawi, Wetterneck, & Chapman, 2013), the standards for sampling heterogeneity in psychometric construction are less clear. As a result, the field of psychometrics has produced a vast array of measures designed and developed utilizing predominantly non-Latinx White samples with little attention to other racioethnic groups. In a recent systematic review of psychometric studies, major limitations in the area of scale development included small sample size and the use of homogenous convenience samples (Morgado, Meireles, Neves, Amaral, & Ferreira, 2017). Thus, the importance of evaluating existing measures, in ethnoracially diverse samples is imperative. Further, it is possible that psychometric tools that are designed to measure concepts related to ideological frameworks, like the CoBRAS, are even more susceptible to potential issues with measurement invariance as individuals from different backgrounds are likely to be differentially impacted by their beliefs around the existence of racism.

Current Study and Hypotheses

The primary aim of the current study is to examine the construct validity of the CoBRAS via confirmatory factor analysis (CFA) and to subsequently test the best fitting measurement model for measurement invariance across race/ethnicity and gender. The original multi-sample validation of the CoBRAS offers strong reasoning for hypothesizing a three-factor structure of the CoBRAS. Accordingly, we hypothesize that the oblique three-factor structure will be confirmed across the three largest racioethnic groups (Latinx, Black, and White) and across gender in our sample. In line with Keum et al. (2018) and Neville et al. (2000), we will test the fit of the original oblique three-factor model (see Figure 1) in the present sample and compare that to 1) the orthogonal three-factor model (see Figure 2), 2) the one-factor model (see Figure 3) and 3) the bifactor model (see Figure 4). In addition, we hypothesize that the three-factor, oblique model will be invariant across race/ethnicity and gender.

Assuming the CoBRAS is found to be invariant across racioethnic groups and gender, a secondary aim of the study is two-fold. First, to examine group differences in CoBRAS scores, and second, to assess the relation between CoBRAS and variables relevant to cross-cultural phenomena (acculturation, ethnic identity, cultural pride, familismo, individualism and collectivism). With respect to group differences in CoBRAS scores, racioethnic group differences were examined in the initial validation paper across Black, White and Hispanic/Latino groups (Neville et al., 2000). If the resulting best fitting model of the CoBRAS is found to be invariant across race/ethnicity, we will proceed with group comparisons. In line with results from Neville et al. (2000), we hypothesize that non-White participants will evidence lower total CoBRAS scores across the three groups. We also hypothesize that the data will evidence the same patterns of CoBRAS subscale scores across groups as in Neville et al. (2000; *see Table 2 for specific predictions*). For example, Latinx participants will have the lowest levels of unawareness of racial privilege (URP) and blatant racism (UBR), while Black participants will have lowest levels of unawareness of institutional discrimination (UID) scores than White and Latinx participants. The initial validation also examined gender differences and found that women scored significantly lower than men on all three CoBRAS subscales. Accordingly, we hypothesize that women in our sample will evidence lower CoBRAS subscale scores than men on all three subscales of the CoBRAS.

The relation of the CoBRAS and three subscales scores with four other scales that measure cross-cultural phenomena will also be examined. Broadly, we hypothesize that CoBRAS scores will have strong negative relationships with more ethnocentric measures (e.g., more awareness of race and racism, lower CoBRAS scores, higher scores in ethnic identity). Conversely, CoBRAS scores will have stronger, positive relationships measures that reflect more of the dominant U.S. cultural values (e.g., less awareness of race and racism, high CoBRAS scores, higher scores in U.S. identity and vertical individualism). More specifically, we will first examine the relation between acculturation, as measured by the Abbreviated Multidimensional Acculturation Scale (AMAS-ZABB; Zea, Asner-Self, Birman, & Buki, 2003) and we hypothesize that individuals with higher scores in CoBRAS would have higher scores in acculturation. The AMAS-ZABB U.S. identity subscale and ethnic identity subscales will allow to examine convergent and divergent validity as well as potential mechanisms for CoBRAS prediction. Next, ethnic identity

(Multigroup Ethnic Identity Measure; Phinney, 1992) and CoBRAS relations will be examined; in line with the literature, we hypothesize that higher levels of CoBRAS would be related to lower CoBRAS scores overall (Phinney, 1992). Lastly, we will conduct exploratory analyses by examining the relation of individualism and collectivism (Horizontal and Vertical Dimensions of Individualism and Collectivism Scale (HVICS; Singelis, Triandis, Bhawuk, & Gelfand, 1995) and the CoBRAS. Specifically, we suspect to find stronger positive correlations for CoBRAS and vertical orientations and stronger negative correlations between CoBRAS scores and horizontal orientations (see Figure 5). The CoBRAS total score and three subscales will also be explored in relation to cultural pride and familismo, two subscales from the Latino/a Values Scale (LVS; Kim, Soliz, Orellana, & Alamilla, 2009). Although this latter scale represents Latinocentric constructs, these were administered for the whole sample and may have utility in improving our understanding of the manifestation of CBRI across different racioethnic groups.

It is worthwhile to further examine the factor structure and test for measurement invariance of the CoBRAS to evaluate the utility of the scale and identify future directions of CBRI research for psychological science. The results of the present study shed light on the empirical utility of the CoBRAS fifteen years after its initial validation (e.g., these data were collected in 2015). To the extent of our knowledge, no one has examined measurement invariance of the CoBRAS across multiple racioethnic groups. Further, it is unclear the degree to which sample size influenced the initial scale validation and reliability estimates of the CoBRAS which makes the present study a unique contribution to the literature.

Method

Procedure

Participants completed an approximately one-hour assessment battery and received course credit for participation in the study. The studies for both sites were approved by the Institutional Review Board at their respective institutions. All analyses were performed in either SPSS, Version 26 (IBM Corp, 2019) or Mplus (version 8.4; Muthén & Muthén, 2017).

Participants

Data for the current study were collected as part of a study (*N* = 911) to examine the universality of cultural factors across different racioethnic groups. Study participants included college students recruited from two large university Psychology Department participant pools in the southwestern (*n*=453) and southeastern (*n*=458) United States. Informed consent was obtained from participants. The original sample included 911 participants with an average age of 21.27 (*SD*=5.21) ranging from 18 to 57. Participants were primarily female (*n*=610; 67.0%) and ranged in educational status, with the majority of the sample being undergraduate college students (99.2%). Racial/ethnic demographics of participants were Asian (n=44; 4.8%), Black (*n*=194; 21.3%), Latinx (*n*=221; 24.3%), White (n=366; 40.2%), American Indian/Alaska Native (*n*=35; 3.8%), Native Hawaiian/Pacific Islander (*n*=13; 1.4%), and "other" (*n*=38; 4.2%). Participants who selected "other" wrote in a wide range of responses, including "human", "Middle Eastern" and "American". Of the participants who were Latinx, almost half were Mexican (*n*=101; 48.8%). The remaining most frequently reported Hispanic subgroup identities were "another Hispanic, Latino or Spanish origin" (*n*=100; 48.3%), Puerto

Rican (*n*=10; 4.8%), and Cuban (*n*=1; 0.5%). Subgroup identity data (e.g., Mexican, Puerto Rican) was missing for 79 Latinx participants at one site. See Table 3 for baseline demographic information.

Racial/ethnic groups with significantly less than 200 participants (<194) were not included in measurement invariance analyses due to sample size conventions (Kline, 2011). It is notable that recommendations for sample size in CFAs are varied. While some recommend a sample size of 200 participants in each group (Kline, 2011), other conventions recommend five to ten observations per item (Brown, 2006; Hair et al., 2006; Russell, 2002). The current study achieves this latter convention for three out of the five racioethnic groups (Black, White, and Latinx).

Measures

Demographic questionnaire

Demographic information was collected through a questionnaire created by the research team. The demographic questionnaire asked participants to report basic demographic information (e.g., age, year in school, religion). To indicate the racioethnic identity, participants were asked two separate questions. First, participants were asked the following question, "Are you Hispanic, Latino, or of Spanish Origin?" Participants could indicate one of five of the following responses: (1) no, not of Hispanic, Latino or Spanish origin, (2) Yes, Mexican, Mexican American, Chicano, (3) Yes, Puerto Rican, (4) Yes, Cuban, (5) Yes, another Hispanic, Latino, or Spanish Origin. Second, participants were asked, "What racial group best describes you?". Participants selected one of five options: (1) African American or Black, (2) Asian or Pacific Islander, (3) Caucasian or White, (4) Native American. The final option, "other", allowed for participants to write in their response. The demographic questionnaire was administered at the end of the assessment battery so as to minimize bias in reporting.

Color-Blind Racial Attitudes

Racial beliefs about the existence of racism were accessed using the 20-item CoBRAS (Neville et al., 2000). This self-report measure uses a 6-point response scale ranging from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*) with the range of possible total scores including 20 to 120 points. Higher scores indicate higher levels of denial or unawareness about the existence of institutional racism, White privilege, and the pervasiveness of racism and racial discrimination (Keum et al., 2018; Neville et al., 2000). In addition to a total score of color-blind racial attitudes, the CoBRAS contains three subscales: unawareness of racial privilege (URP; 7 items; "Everyone who works hard, no matter what race they are, has an equal chance to become rich"), unawareness of institutional discrimination (UID; 7 items; "White people in the United States are discriminated against because of the color of their skin"), and unawareness of blatant racism (UBR; 7 items; "Racism may have been a problem in the past, it is not an important problem today"). Items for each subscale are summed to obtain scores. Neville and colleagues (2000) found that the CoBRAS exhibited good psychometric properties in predominantly White samples (Cronbach's alpha ranging from .70 to .86 for the full CoBRAS scale).

Acculturation

Acculturation was assessed using the 42-item Abbreviated Multidimensional Acculturation Scale (AMAS-ZABB; Zea, Asner-Self, Birman, & Buki, 2003). The AMAS-ZABB contains six factors, and each are comprised of 6 items. Subscales include:

U.S. cultural identity ("I have a strong sense of being U.S. American"); ethnic identity ("I have a strong sense of being [culture of origin]"); mastery of English ("How well do you speak English at school or work"); mastery of native language ("How well do you speak you native language with family?"); U.S. cultural competence ("How well do you know popular American television shows?"); country-of-origin cultural competence ("How well do you know popular television shows in your native language?"). The latter two subscales are measured on a 4-point response scale (1 = *not at all*, 4 = *well/like a native*) whereas the remaining subscales related to cultural identity are measured on a different 4-point response scale (1 = *strongly agree*, 4 = *strongly agree*).

The multiple sample scale validation and reliability estimates were conducted first with Latino/a university and community college students from the mid-Atlantic region of the U.S. in English. In a second study consisting of Central American immigrants, the measure was validated in Spanish. The AMAS-ZABB has been found to demonstrate sound psychometric properties, suggesting that it is a good measure of acculturation and, per the authors of the scale, is amenable to use with non-Latin/a groups as well (Zea et al., 2003).

Ethnic Identity

Ethnic identity affirmation/ belonging and ethnic behaviors were assessed using two subscales from the 14-item Ethnic Identity Scale from the Multigroup Measure of Ethnic Identity (MEIM; Phinney, 1992). The additional subscale (achievement) was omitted from the study due to experimenter error. Both affirmation/belonging (5 items; "I have strong attachment towards my own ethnic group") and ethnic behaviors (2 items; "I am active in organizations or social groups that include mostly members of my own ethnic group") were measured on a 4-point response scale (1 = *strongly disagree*, 4 = *strongly agree*). The MEIM was originally validated in racioethnically diverse samples of high school (*n*=417) and college students (*n*=136) and was found to be a reliable measure of ethnic identity with sound psychometric properties (Phinney, 1992).

Latino/a Values

Cultural pride and familism (or "familismo") were assessed using two subscales (15-items) of the original 35-item Latino/a Values scale (LVS; Kim, Soliz, Orellana, & Alamilla, 2009). Two additional subscales from the LVS (simpatía and espiritismo) were excluded from the present study as they demonstrated poor reliability per Kim et al. (2009). Both cultural pride (10 items; "one's bond with one's cultural group must be very strong") and familismo (5 items; "one should never bring shame upon one's family") were measured on a 4-point response scale (1 = *strongly disagree*, 4 = *strongly agree*). The initial validation of the psychometric properties of the LVS indicate that the total score (35-items) and the two subscales used in the present study provide adequate and valid measures of Latino/a values (Kim et al., 2009). Notably, the original scale validation utilized multiple samples that were collected in two major west coast universities where the majority of the sample identified as Mexican or Chicano/a (ranging from 69.7% to 80.3%).

Individualism and Collectivism

Levels of individualism and collectivism (e.g., a spectrum of seeing the self as autonomous versus part of a collective) were assessed with the Horizontal and Vertical Dimensions of Individualism and Collectivism Scale (HVICS; Singelis, Triandis, Bhawuk, & Gelfand, 1995). The 32-item scale measures individualism and collectivism with four corresponding subscales: Vertical individualism (values autonomy, accept social inequities between people), vertical collectivism (values social harmony, accept social inequities between people), horizontal individualism (highly autonomous, value social equality) and horizontal collectivism (values social harmony, value social equality; see Figure 5). Items are measured on a 9-point Likert-type scale (1 = *never* or *definitely no,* 9 = *always* or *definitely yes*) and each of the four subscales consist of 8-items. Scores specific to the broader two domains of individualism and collectivism, 16-items each, may be summed to obtain a total score for each of these components. Singelis et al. (1995) found that the HVICS exhibited good psychometric properties.

Data Analysis

Procedure and Statistical Analyses

All analyses were performed using IBM Statistical Package for the Social Sciences (SPSS) Version 26 (IBM Corp, 2019) and M*plus* Version 7.0 (Muthén & Muthén, 2006). Following a series of data checks and data cleaning as indicated, an independent samples *t*-test will be used to examine group differences across the two sites, including age, gender, and racioethnic groups using SPSS. Descriptive statistics and internal consistency reliability for the scales include in the study were also conducted in SPSS. All other analyses (described below) were conducted in M*plus.*

Internal Consistency Reliability

To evaluate internal consistency reliability, the Cronbach’s alpha (α) of the CoBRAS and the three CoBRAS subscales was calculated across the full sample and racioethnic subgroups. Cronbach’s alpha was also calculated for the additional measures used in the study: HVICS (4 subscales), LVS (cultural pride and familism subscales), and

AMAS-ZABB (6 subscales). A priori cutoffs for internal consistency reliability will be used (e.g., >0.9 as "excellent"; >0.8 as "good"; >0.7 as "acceptable"; Gliem & Gliem, 2003).

Confirmatory Factor Analysis (CFA) and Multiple-Group CFA (MGCFA)

CFA was conducted to examine the validity of the one-, three-, and bi-factor models. CFA and MGCFA were used to examine model fit, and weighted least square (WLSMV) estimation was used as it has been found to yield robust estimates in conditions of nonnormality and is preferable to use with categorical data (Li, 2016). Multiple indicators of model fit were examined including: (1) the Chi-square goodness-of-fit; (2) root mean square error of approximation (RMSEA; values <.08 are acceptable); (3) comparative fit index (CFI; values > .96 are acceptable); (4) Tucker Lewis Index (TLI; values >.96 are acceptable); and (5) standardized root mean square residual (SRMR; values <.08 are acceptable). Given the susceptibility to sample size of the Chi-square test, a non-significant Chi-square was not considered a requirement for evidence of model fit. As such, approximate fit indices (RMSEA, CFI, TLI, and SRMR) were relied on to assess model fit. Each indicator has its own convention (threshold) for assessing model fit. For example, SRMR fit statistic values equal to or beneath .08 are considered acceptable and evidence a good fitting model; if, however, SRMR is above .10, it would suggest a poor fitting model. Correlational residuals were also examined to further examine model fit. Reasonable model fit was determined by three out of the five fit indices being in the acceptable range.

Revisions to Data Analysis Plan

Amendments were made to the data analysis plan post-hoc that are described herein. Model fit was observed to be poor in all CFA and MGCFA analyses conducted (see results for an overview of the findings). Therefore, the data analysis plan was revised to the following. The full sample (*N*=911) was divided into two random split-halves using SPSS. Each subsample was examined for differences across institute, age, race/ethnicity, and gender using independent samples t-tests in SPSS. The first half of the sample (development sample) was examined using exploratory factor analysis (EFA) to determine a viable CoBRAS factor structure. CFA was then conducted to evaluate model fit of the new model. Modification indices were used to remove items contributing to model misfit. Once a good fitting model was determined, it was then confirmed in the second half of the sample (validation sample) using CFA. More details of this process are included in the results section.

Measurement Invariance Testing

The best-fitting model was then tested for measurement invariance across the three largest racioethnic groups (Black, White, and Latinx) using theta parameterization. This included titrating constraints of model fit beginning with configural model (no constraints), and proceeding with metric model, and scalar model, respectively. However, metric and scalar models were not tested separately due to computational equivalence of scalar and metric models in the context of categorical data (Wu & Estabrook, 2016). Specifically, this involved testing both the metric (constraining unstandardized factor loadings) and scalar (constrained factor thresholds) to be equal across groups with latent factor means constrained to 0 in one group. Model comparison between the configural and scalar models was conducted by examining the Chi-square difference tests, and changes of the CFI, RMSEA, and SRMR. Changes of CFI (less than .01), RMSEA (less than .015) and SRMR (less than .03) indicate non-significant model fit and support measurement invariance (Chen, 2007). Different levels of invariance warrant different metrics of assessment for overall level of invariance versus item-level examinations for sources of invariance. For example, a 0.56 difference in standardized threshold is considered a critical cutoff and indicative of an odds ratio of 1.75 (Van Horn, Atkins-Burnett, Karlin, Ramey, & Snyder, 2007).

Sample size conventions for MGCFA and measurement invariance are contentious at best; however, it is important to understand how sample size might influence model fit statistics. For example, the Chi-square statistic as well as CFI and TLI modification indices are sensitive to sample size where large samples can increase the likelihood of type I error. More specifically, the Chi-square statistic (χ^2) is influenced by sample size such that larger samples bias the results of the test (Brown, 2006). However, other model fit indices may not be as sensitive to sample size but are not as sensitive to non-invariance (Brown, 2006) thus supporting the choice to use multiple indicators to evaluate model fit. As mentioned above, different conventions exist (e.g., sample sizes greater than 200, five to ten observations per indicator) and other conventions exist that are less well utilized and understood.

Group Comparisons

If the levels of measurement demonstrate invariance across groups, then comparisons can be made across CoBRAS mean total and subscale scores (e.g., latent mean differences) across racioethnic groups and gender. Exploratory analyses can also be conducted looking at the correlation between CoBRAS total score and subscales and a measures of interest (HVICS, LVS, AMAS-ZABB, and MEIM). Per conventions used in the CBRI literature, correlations between the CoBRAS (total score and three subscales) will be calculated. Additionally, MANOVA can be conducted to examine whether there are differences across racioethnic groups on the CoBRAS and each of the three subscales. If, however, the CoBRAS is found to not be invariant across racioethnic groups, then group differences will not be examined in these constructs as any group comparison on the measure would be considered invalid and not substantively meaningful because the same latent construct may not be evidenced across groups.

Results

Descriptive Statistics

The Likert-type items from the CoBRAS were examined for univariate normality. Table 4 provides an overview of the mean, standard deviation, and skewness values by item. Specifically, the skewness ranged from -0.521 to 0.926 and the mean skewness was 0.304. These data achieved recommended conventions such that the skewness for each item did not exceed |3| (Kline, 2011).

Initial CFA

Four previously published CoBRAS factor structures were tested for fit in the current diverse college student sample (one-factor, three-factor orthogonal, three-factor oblique, and bi-factor models) using WLSMV estimation to accommodate categorical, Likert-type data. A best fitting model did not emerge. All four models exhibited poor model fit to the data as determined by the CFI, TLI, RMSEA, and SRMR indices. Further, each model was also run in the three largest racial/ethnic groups (Black, Latinx, and White) and gender (male and female) with similar findings. A summary of the measurement model findings based on the CFAs are offered in Table 5. Overall, the models fit poorly across the different subgroups as well.

The data analysis plan was subsequently amended to conduct exploratory analyses, splitting the sample into two random halves in order to find a measurement model that was a better fit of the data. Sample A, the exploratory sample, and sample B, the validation sample. The purpose of the exploratory sample was to examine the psychometric properties of these data using exploratory methods including exploratory factor analysis (EFA), confirming the EFA findings through CFA, and assessing the potential need for item reduction using modification indices. The validation sample would then serve as a vehicle to confirm findings with respect to the factor structure determined in the exploratory sample and be used to examine measurement invariance across groups. The respective random samples did not statistically differ in gender [t(909)=0.236, p=0.813], race/ethnicity [t(909)=0.746, p=0.456], or age [t(8680=1.601, p=0.110].

Exploratory Sample

Given that all four preexisting models fit these data poorly, an EFA was used to examine the internal structure of the CoBRAS. The 20-item CoBRAS item correlation matrix was first evaluated to determine the appropriateness of these data for factor analysis. Sample size was determined to be adequate (5 to 10 participants per item). Keiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.958 and above recommended convention of 0.60. Bartlett’s test of sphericity was significant, χ^2 (231) = 24415.53, p < .001, suggesting sufficient multicollinearity for the factor analysis. Further, communalities were all above the recommended convention of 0.3. According to the EFA, two factors had eigenvalues greater than one. A parallel analysis (PA) was then conducted (Patil et al., 2017) using a web-based computation engine that randomly generated eigenvalues to compare to the values obtained in the EFA. The eigenvalues were greater than the computed eigenvalues from the PA for the first two factors, suggesting the retention of two factors for the CoBRAS.

An additional EFA was then computed using direct oblimin rotation to determine whether the two factors were orthogonal or oblique. The correlation matrix yielded a correlation of 0.822 between the two factors suggesting that an oblique rotation was appropriate for these data. Further, two factors were identified based on the convention of retaining factors with eigenvalues greater than one and based on examination of the scree plot (where a break in the slope was observed at two). The first factor accounted for over half of the total variance for all CoBRAS items (78%) and included ten items. The second factor accounted for an additional 7% of the total variance and included ten items. All items had pattern coefficients > |.40| on the first factor and second factor of this solution (see Table 6). The internal consistency reliability of the two factors was found to be acceptable for factor one ($\alpha = 0.783$) and below the acceptable lower limit for factor two ($\alpha = 0.635$). Potential explanations for low alpha values include a high degree of measurement error, scale length, and the impact of reverse-coded items (Cronbach, 1951; Hughes, 2009; Swailes & McIntyre-Bhatty, 2002).

A CFA of the 20-item, two-factor solution was then conducted in the exploratory sample to examine evidence of model fit to the data. In line with the reliability findings, the CFA suggested poor model fit to the data (χ^2 [169]=2010.988, p<.001; CFI = 0.637;

TLI = 0.592; RMSEA = 0.162 [90% confidence interval {CI} 0.155-0.168]; $p<.001$; SRMR = 0.117). Further model revisions based on modification indices were completed by dropping items one at a time by summing the modification index value for each item and then removing the item with the largest overall predicted reduction in the chi-square value. Each time the item with the largest value was dropped from the model, a CFA was conducted to examine the model fit with the item removed to assess the adequacy of model fit without the item (see Table 7). The same process was conducted, removing one item at a time after summing the total modification indices by item, until model fit reached an acceptable range. After dropping twelve items, an 8-item, two-factor measure that demonstrated reasonable overall model fit was identified (χ^2 [19]=79.031, $p<.001$; CFI = 0.963; TLI = 0.945; RMSEA = 0.087 [90% confidence interval {CI} 0.068-0.107]; $p=.001$; SRMR = 0.035). However, two of the of items had a very low factor loadings: item 10 (0.048) and item 18 (0.113).

Therefore, the two items were dropped from the measure, one at a time, to further examine model fit. Item 10 was first dropped from the measure because it had the lowest factor loading of the two items identified. This evidenced an improvement in overall model fit (χ^2 [13]=46.857, $p<.001$; CFI = 0.979; TLI = 0.965; RMSEA = 0.079 [90% confidence interval {CI} 0.055-0.104]; $p=.023$; SRMR = 0.026). Removing item 18 yielded negligible changes to overall model fit to the data (χ^2 [8]=41.375, $p<.001$; CFI = 0.979; TLI = 0.960; RMSEA = 0.100 [90% confidence interval {CI} 0.071-0.131]; $p=.003$; SRMR = 0.025). However, the RMSEA measure of fit was outside the recommended threshold to constitute a good fitting model suggesting a potential misfit of the model to these data. RMSEA can falsely identify a poor fitting model in specified models with small degrees of freedom and smaller samples sizes (Kenny, Kaniskan, & McCoach, 2015). The need to split the sample in half to conduct exploratory analyses yielded a smaller sample size for this part of the analysis. This and the small degrees of freedom may have contributed to findings. The resulting six-item, two-factor model with both items 10 and 18 removed was determined to be the best overall fitting model given this caveat (χ^2 [8]=41.375, p<.001; CFI = 0.979; TLI = 0.960; RMSEA = 0.100 [90% confidence interval {CI} 0.071-0.131]; p=.003; SRMR = 0.025). The two factors evidenced poor internal consistency reliability (factor 1: α = 0.586; factor 2: α = 0.665). It is likely that the small number of items (<7) of the scale contributed to low alpha values (Swailes & McIntyre-Bhatty, 2002).

The resulting six-item, two-factor solution appears to be best explained by Frankenberg's (1993) two-part conceptualization of CBRI –color evasion and power evasion (see Figure 6). The first factor, color evasion, includes items that evaluate the respondents degree of awareness around White racial dominance and skin privilege (e.g., "White people in the U.S. have certain advantages because of the color of their skin"). While the second factor, power evasion, evaluates the degree which a respondent denies the systemic legacy of racism in the United States (e.g., Race plays a major role in the type of social services -such as type of health care or day care -that people receive in the U.S."). It appears that even with only six out of twenty items retained from the original CoBRAS measure, the overall structure of how CBRI is conceptualized in the literature has been preserved with the resulting model.

Validation Sample

The resulting two-factor model from the exploratory analysis (Figure 6) contained six-items with three items in each of the two factors. This solution was confirmed in the validation sample (sample B) in order to provide confirmatory evidence of findings from the exploratory sample. The two-factor solution yielded reasonable overall model fit to the data (χ^2 [8]=46.310, *p*<.001; CFI = 0.984; RMSEA = 0.101 [90% confidence interval {CI} 0.074-0.130]; *p*=.001; SRMR = 0.025). Still, with the caveats mentioned regarding the RMSEA sensitivity to sample size and small degrees of freedom. Overall, the six-item, two-factor model was an acceptable fit to the data in the sample.

The factor structure was also determined to have reasonable fit of these data across race/ethnicity and gender (see Table 8). The internal consistency reliability of the two factors was found to range from 0.619 (factor 1) to 0.708 (factor 2). In comparison to the exploratory sample, the alpha values are higher but still at or below the recommended acceptable threshold (0.7). As previously stated, measurement error, scale length, and reverse-coded items are possible explanations for these low values. This model was tested for invariance across the three largest racial/ethnic groups and gender, respectively. While testing invariance across gender was done in the validation sample, when testing measurement invariance across racial/ethnic groups the full sample was used in order to meet the recommended sample size requirements for measurement invariance (e.g., five to ten cases per item; Kline, 2011).

Measurement Invariance

Table 9 displays the results of measurement invariance across race/ethnicity and gender. Findings by race/ethnicity and gender are described below.

Race/Ethnicity Invariance

A test of configural invariance indicated that the model fit these data adequately in all three racial/ethnic groups (χ^2 [24]=106.149, p<.001; CFI = 0.977; TLI = 0.956; RMSEA = 0.116 [90% confidence interval {CI} 0.094-0.139]; p<.001; SRMR = 0.030). This indicates that the factor structure of the CoBRAS were the same across Black, White, and Latinx groups. The chi-square difference test was conducted to examine the comparative fit of the scalar and configural invariance models. The chi-square different test was significant, indicating the model fit of the scalar model was significantly worse than the configural model ($\Delta\ \chi^2$ [66] = 443.115, p <.001; Scalar model fit: χ^2 [90]=549.225, p<.001; CFI = 0.869; TLI = 0.935; RMSEA = 0.142 [90% confidence interval {CI} 0.130-0.153]; p<.001; SRMR = 0.054) and changes in CFI and RMSEA were greater than .01 (ΔCFI=0.108 ; ΔRMSEA=-0.026; ΔSRMR=-.024). To identify sources of misfit, factor loadings and thresholds were examined.

This suggested that while the factor structure across race/ethnicity was invariant across Black, White, and Latinx groups, the item thresholds were not invariant. Specifically, item thresholds were lower overall in the Black group followed by Latinx and then White. Tests of strict/strong invariance were not conducted in light of the lack of scalar invariance. Overall, the tests of invariance indicated that the CoBRAS was not equivalent across racial/ethnic groups beyond the configural level. Given the lack of invariance across the three groups, tests of partial invariance were examined across two groups at a time: (1) Latinx and White; (2) Latinx and Black; and (3) Black and White to find potential sources of invariance. As such, different groups achieved different levels of partial invariance and are described in the following sections. Configural models of invariance for Black, White, and Latinx groups are displayed in Figures 7, 8 and 9 respectively.

Latinx and White

The test of configural invariance revealed that the model fit the data adequately across the two groups (χ^2 [16]=75.034, p<.001; CFI = 0.977; TLI = 0.956; RMSEA = 0.113 [90% confidence interval {CI} 0.088-0.140]; p<.001; SRMR = 0.030), indicating that the factor structure of the CoBRAS was the same across Latinx and White participants. The chi-square difference test was conducted to compare the fit of the scalar and configural invariance models. This test was significant ($\Delta\chi^2$ [52]=95.304, p<.001), indicating the model fit of the scalar model was significantly worse than the configural model (χ^2 [52]=142.850, p<.001; CFI = 0.964; TLI = 0.979; RMSEA = 0.078 [90% confidence interval {CI} 0.063-0.094]; p=.002; SRMR = 0.041). This suggests a lack of invariance across factor intercepts in the two groups and is confirmed by the changes in CFI and RMSEA (ΔCFI=0.013; ΔRMSEA=0.035; ΔSRMR=-.011).

In order to assess for sources of invariance, tests of partial scalar invariance were conducted across Latinx and White groups. Separate models were conducted where each item intercept, respectively, was allowed to vary between groups. These analyses revealed that only when all six items were allowed to vary between groups was partial scalar invariance achieved. The difference test was not significant ($\Delta\chi^2$ [6]=14.724, p=0.0225; ΔCFI=.004; ΔRMSEA=0.01; ΔSRMR=-.006). Accordingly, the CoBRAS achieved both configural and partial scalar invariance (χ^2 [22]=70.432, p<.001; CFI = 0.981; TLI = 0.974; RMSEA = 0.088 [90% confidence interval {CI} 0.064-0.111]; p=.004; SRMR = 0.036). The standardized thresholds in the Latinx group were higher than in the White group, suggesting that overall higher levels of color-blind racial attitudes were needed to endorse all items. However, the differences did not exceed 0.56

except for endorsing 6 on item 12 (“White people in the U.S. have certain advantages because of the color of their skin,”).

Black and White

A test of configural invariance across Black and White groups revealed that the model fit the data adequately across groups (χ^2 [16]=81.923, *p*<.001; CFI = 0.976; TLI = 0.955; RMSEA = 0.122 [90% confidence interval {CI} 0.097-0.149]; *p*<.001; SRMR = 0.030). These findings suggest that the factor structure and loadings of the CoBRAS was the same across Black and White groups. However, the chi-square difference test conducted to examine the comparative fit of the scalar and configural invariance models was significant and changes in other measures of fit exceeded critical cutoffs ($\Delta\chi^2$ [36]=382.753, *p*<.001; ΔCFI=0.133; ΔRMSEA=-0.051; ΔSRMR=-.03). This finding demonstrates that the model fit of the scalar model was significantly worse than the configural model (χ^2 [52]=479.440, *p*<.001; CFI = 0.843; TLI = 0.910; RMSEA = 0.173 [90% confidence interval {CI} 0.159-0.187]; *p*<.001; SRMR = 0.060) and a lack of invariance across item intercepts in the two groups.

Tests of partial scalar invariance were conducted to assess sources of invariance across Black and White participants. Factor loadings for each item separately were allowed to vary across groups. These analyses revealed that when all six items were allowed to vary between groups the difference test remained significant ($\Delta\chi^2$ [6]=38.683, *p*<.001), however changes in CFI and RMSEA were not significant (ΔCFI=0.009; ΔRMSEA=0; ΔSRMR=-.005). Thus, the CoBRAS was found to be achieve configural and partial scalar invariance, with the partial scalar model not fitting significantly worse than the configural model (χ^2 [22]=112.107, *p*<.001; CFI = 0.967; TLI = 0.955; RMSEA

= 0.122 [90% confidence interval {CI} 0.100-0.145]; p<.001; SRMR = 0.043). Overall higher levels of color-blind racial attitudes were needed to endorse all items in the Black group as compared to the White group (e.g., the standardized thresholds in the Black group were higher than in the White group). Differences between the standardized threshold loadings exceeded 0.56 for: (1) response choices 2, 3, 4, 5, and 6 on items 5 ("Racism is a major problem in the U.S."), and 15 ("White people are more to blame for racial discrimination in the U.S. than racial and ethnic minorities,"); (2) 2, 3, 5, and 6 on item 12 ("White people in the U.S. have certain advantages because of the color of their skin,"); (3) 2, 3, 4, and 5 on item 8 ("Racial and ethnic minorities do not have the same opportunities as White people in the U.S"); and (4) 6 on item 17 ("It is important for public schools to teach about the history and contributions of racial and ethnic minorities").

Black and Latinx

The test of configural invariance across Black and Latinx groups revealed that the model fit was adequate across groups (χ^2 [16]=56.269, p<.001; CFI = 0.977; TLI = 0.957; RMSEA = 0.112 [90% confidence interval {CI} 0.081-0.144]; p<.001; SRMR = 0.031). The chi-square difference test conducted to examine comparative fit of the scalar and configural models was significant (χ^2 [36]=147.596, p<.001; ΔCFI=.059; ΔRMSEA=.004; ΔSRMR=-.017). These findings indicated that the scalar model fit the data significantly worse than the configural model (χ^2 [52]=196.917, p<.001; CFI = 0.918; TLI = 0.958; RMSEA = 0.118 [90% confidence interval {CI} 0.100-0.135]; p<.001; SRMR = 0.048) and demonstrates a lack of invariance of thresholds across the two groups.

Tests of partial scalar invariance were conducted to assess for sources of invariance across Black and Latinx participants. Item thresholds were allowed to vary across groups for each item separately. These analyses revealed that when all six item thresholds were allowed to vary across groups the difference test was not significant (χ^2 [6]=8.342, p=0.2141) and the changes in CFI and RMSEA were the closest to the recommended cutoffs for two indices (ΔCFI=-.007; ΔRMSEA=0.043; ΔSRMR=-.004). Therefore, the CoBRAS was found to achieve configural and partial scalar invariance (χ^2 [27]=49.777, p<.001; CFI = 0.984; TLI = 0.979; RMSEA = 0.079 [90% confidence interval {CI} 0.050-0.109]; p=.05; SRMR = 0.035). Higher levels of color-blind racial attitudes were needed to endorse all items in the Black group as compared to the Latinx group (e.g., the standardized thresholds in the Black group were higher than in the Latinx group). Differences between the standardized threshold loadings exceeded ±0.56 for item 15 only for endorsing a 2, 3, 4, or 5 ("White people are more to blame for racial discrimination in the U.S. than racial and ethnic minorities").

Gender Invariance

The test of configural invariance indicated that the model fit the data reasonably in both groups (χ^2 [16]=57.703, p<.001; CFI = 0.983; RMSEA = 0.106 [90% confidence interval {CI} 0.077-0.136]; p=.001; SRMR = 0.028). This suggests that the factor structure of the CoBRAS was the same in male and female gender. The chi-square difference test was utilized to compare the fit of the scalar and configural invariance models. This test was significant, $\Delta\chi^2$ [30]=92.044, p<.001, ΔCFI=0.02, ΔRMSEA=0.014, ΔSRMR=-.011, indicating that the scalar invariance model yielded significantly worse fit than the configural invariance model (χ^2[46]=136.071, p<.001; CFI

= 0.963; TLI = 0.976; RMSEA = 0.092 [90% confidence interval {CI} 0.074-0.110]; $p<.001$; SRMR = 0.039). This suggests that the item thresholds were not invariant across male and female groups. Given the lack of scalar invariance, tests of strict invariance were not conducted. Overall, the tests of invariance indicated that the CoBRAS was not equivalent across gender (see Figure 10).

In order to examine the source of invariance, tests of partial scalar invariance were conducted. Each item threshold was allowed to vary across gender at a time. Findings indicated partial scalar invariance was attained when allowing the item thresholds for all six items to vary ($\Delta\chi^2$ [6]=14.190, p=0.0276; ΔCFI=-0.002; ΔRMSEA=0.022; ΔSRMR=-.006). The chi-square test was non-significant and two out of the three additional fit indices were within critical cutoffs, suggesting that the partial scalar model was not a significantly worse fit to these data than the configural model (χ^2[22]=57.789, $p<.001$; CFI = 0.985; TLI = 0.980; RMSEA = 0.084 [90% confidence interval {CI} 0.058-0.110]; p=0.019; SRMR = 0.034). Overall, item thresholds were higher for female than for male participants suggesting that it required higher levels of color-blind racial attitudes to endorse items. The differences in standardized thresholds, however, only exceeded a critical value (0.56) for response choice 6 on item 5 ("Racism is a major problem in the U.S.").

Group Comparisons

Means and standard deviations for the CoBRAS factors by group and other cross-cultural variables are displayed in Table 10. Specifically, the MEIM, AMAS-ZABB, LVS, and HVICS scales are included in the table. Further group comparisons, such as differences across CoBRAS scores, and correlations between CoBRAS scores and cross-cultural variables, were not conducted due to the limited invariance, and exploratory nature and novel factor structure of the CoBRAS derived from these data. Internal consistency reliability estimates for the data are displayed in Table 11.

Discussion

The purpose of the current study was to assess internal consistency reliability, factor structure, and measurement invariance of the CoBRAS across three racial/ethnic groups (Black, Latinx, and White) and male/female gender respectively using MGCFA by first examining the overall fit of four competing models. Inconsistent with the study hypotheses, the three-factor CoBRAS evidenced poor model fit in these data, and across race/ethnicity and gender respectively. Additionally, the four competing models previously evidenced in the literature were examined, and all were found to be poor fitting to these data. Given the poor fit of these models and theoretical rationale that CBRI has taken on new forms over time, an EFA was performed to examine the item factor structure and assess underlying domains of the CoBRAS in this diverse college student sample. Although a two-factor solution emerged among the 20-items, the subsequent CFA also evidenced poor model fit and modification indices were used to reduce items to improve model fit. A resulting two-factor, six-item solution emerged that overall fit reasonably well to these data in both random subsamples that were generated for the purposes of exploration and validation of model fit. Tests of measurement invariance indicated that the CoBRAS was not invariant across race/ethnicity and gender, however a degree of partial scalar invariance was achieved across groups.

Contrary to the study hypothesis, the original, three-factor CoBRAS structure was a poor fit to these data. The three additional models previously evidenced in the literature were also found to fit the data poorly. Multiple sources of misfit were examined, but a specific source of misfit was not found. Perhaps this is not surprising and can be best explained by the fluid nature of ideology. Specifically, Bonilla-Silva (2020) has described ideologies as being “always on the move.” Ideology is highly susceptible to change overtime and is adaptable to contexts. This may be particularly true of color-blind racial ideology, as the U.S. continues to diversify and efforts to dismantle systemic racism are increasingly at the forefront of sociopolitical dialogue. To this end, the current study explored alternative factor solutions for the CoBRAS.

The EFA suggested that the 20-item CoBRAS fit a two-factor solution, item reduction using modification indices was required to achieve reasonable model fit in both subsamples of the data. The two-factor, six-item solution that emerged appeared to capture two overarching constructs within color-blind racial attitudes – (1) color evasion (e.g., “White people in the U.S. have certain advantages because of the color of their skin”) and (2) power evasion (e.g., “Racism plays a major role in the type of social services that people receive in the U.S.”). This is consistent with prior work in the sociological literature, in that it captures the manifestation of internalized racism and White racial privilege (Bonilla-Silva, 1996) and the denial of a system that structurally assigns White people as the dominant race (e.g., systemic racism). However, the replicability of this two-factor solution and its interpretation is an empirical question worthy of further scientific inquiry.

In comparison to the original three-factor model, the items retained in the current model did not all load on the same factors as the previous, three-factor model. For example, factor one (color evasion) of the current model contained items 12, 15, and 17, only two of which were previously included in the unawareness of racial privilege in the original CoBRAS model. Specifically, item 17 ("It is important for public schools to teach about the history and contributions of racial and ethnic minorities") was a part of the unawareness of blatant racial issues factor in the original model. It is possible that color evasion is captured in item 17, given that U.S. History, as taught in public schools, primarily reflects a White narrative with respect to content, context, and representation of White people. This overrepresentation may in some way contribute to the maintenance of color evasion among those high in color-blind racial attitudes. Additionally, factor two of the current model contained items 2, 5 and 8, two of which were a part of the unawareness of racial privilege factor (2 and 8) and one from the unawareness of blatant racial issues factor (5). The three items, however, all include content suggesting an unawareness of structural racism such as a denial that racism is a problem and that it influences resources and opportunities for racial and ethnic minorities indicative of power evasion (e.g., "everyone has the same opportunities; Neville et al., 2013). Overall, more items from the first factor in the original model were retained in the resulting model even though they loaded more strongly onto separate factors. Other interpretations of the resulting model are possible, thus warranting further scientific inquiry using both quantitative and qualitative methodology.

The new CoBRAS model evidenced significant misfit across race/ethnicity and gender. With respect to specific sources of misfit, it is important to note that different pairs of identities achieved different levels of partial scalar invariance. Specifically, statistically different item thresholds were observed in all four pairs of groups (Latinx-White, Black-White, Black-Latinx, Male-Female), with fewer item threshold differences across gender and the most item threshold differences across Black and White participants. Previous research has demonstrated differences in CBRI across gender (Neville et al., 2000) and support of affirmative action (Awad et al., 2005) such that men held higher levels of CBRI and were less supportive of affirmative action. Study findings support previous research in that men evidenced lower item thresholds on the CoBRAS suggesting an overall lower level of color-blind racial attitudes needed to endorse items.

The new model was also not found to be invariant across three racial/ethnic groups (examined in pairs). Conceptually, this can be understood in multiple nuanced ways. First, a higher threshold for a particular item suggests a greater degree of difficulty endorsing a given response option for a particular item which in turn suggests that an overall higher level of color-blind racial attitudes (CoBRAS) was needed to endorse a particular level of an item. For example, it takes a higher level of CoBRAS for Black participants to respond strongly disagree (reverse coded) for item 15 ("White people are more to blame for racial discrimination than racial and ethnic minorities") than White participants. This finding should not be surprising given that lack of measurement invariance can stem from the measure itself as well as individual factors (Meredith & Teresi, 2006). Due to the impact of racism, systemic factors that influence group differences above and beyond the measure are also likely to explanations for noninvariance. The original scale validation found differences across race/ethnicity in CoBRAS scores but did not examine factorial invariance (Neville et al., 2000), providing potential preliminary evidence of potential lack of invariance across race/ethnicity.

In some ways, establishing partial invariance is sufficient to conduct groups comparisons. However, the degree to which the original CoBRAS scale was reduced in addition to the differences in partial scalar invariance achieved across different groups suggests that more research is needed to determine whether the six-item, two-factor model retains the degree of theoretical meaning of the construct of color-blind racial attitudes as originally intended. The study findings yield evidence that there are potential meaningful quantitative differences in CBRI that exist across race/ethnicity and gender that are potentially not captured by the CoBRAS measure. Specifically, the experience of holding color-blind racial attitudes for a Black person means something different on both an individual and societal level than for the espousal of colorblindness for a White person (e.g., alleviating dissonance; Neville et al., 2000).

Perhaps requiring invariance to conduct group comparisons is too lofty a goal given the degree to which different cultural groups may interpret items (potential source of non-invariance). However, another potential source of invariance includes limitations of the CoBRAS measure as it is primarily a metric of the cognitive component of racism, arguably more susceptible to differences across sociodemographic groups, and does not adequately address affective and behavioral manifestations of CBRI. Other measures have been developed to assess the racial privilege component of CBRI. For example, the White Privilege Attitudes Scale (Pinterits, Poteat, & Spanierman, 2009) assesses willingness to confront White privilege, anticipated costs of addressing White privilege, awareness of White privilege, and remorse surrounding White privilege. Example items include “I intend to work toward dismantling White privilege,” (behavioral) and “I am anxious about the personal work I must do within myself to eliminate White privilege” (affective). As Neville et al. (2000) assert, in order to expand the measurement of CBRI qualitative work is needed to better understand racial/ethnic group differences and the implications of holding high or low CBRI across race/ethnicity, gender, and other marginalized groups.

Bonilla-Silva (2020) delineates, the primary function of racial ideology is to validate a universal worldview. It is then worthwhile to consider the meaning and impact of measurement invariance research questions across historically and contemporarily marginalized groups. When the goal for conducting measurement invariance testing is universality, it could be argued that this serves to reify the dominant ideology through statistical methods. For example, these methods may minimize the degree to which racism plays a role in dominant ideologies and the operationalization of psychological constructs.

Limitations

This study was not without limitations. First, the sample consisted of university college students in two culturally distinct regions of the United States. Thus, findings may not be generalizable to other geographic regions. For example, the Southwest has a higher percentage of the population with Latinx and AI/AN heritage as compared to other regions. While color-blind racial attitudes surely exist in this region, it is likely that the unique sociopolitical context and history limits the generalizability of study findings. Additionally, given that the participants were primarily female college students, findings may not generalize to groups that differ on age, gender/sex, educational status, and other cultural factors.

There were also limitations regarding the chosen analyses and sample size. For instance, the lack of fit of the previously existing CoBRAS factors structures necessitated separation of the sample into two random halves for development and validation of an improved model. Additionally, to conduct measurement invariance across racial/ethnic groups the full sample was needed to achieve the needed sample size for analyses. Sample size limitations of the chosen analyses also resulted in the exclusion of certain racial groups (e.g., AI/AN) from tests of measurement invariance and potentially influenced global fit indices (e.g., RMSEA).

Demographic data collection comprised an additional study limitation. The chosen method to enter racial/ethnic demographic data conflated race and ethnicity such that the Latinx participants were coded as Latinx irrespective of whether they were White, Black, or identified as another race. While there are benefits to conflating demographics questions, such as reducing participant burden, there are differences across populations not captured in these data. For example, missing from these study findings are Latinx Black, Latinx White, etc. It is recommended that future research continue to separate out race and ethnicity as well as capture other aspects of racial socialization such as socially assigned race (Jones et al., 2008).

Future Directions and Implications

As previously stated, the CoBRAS was not found to be invariant across race/ethnicity and gender despite achieving varying degrees of partial scalar invariance across groups. It is equally likely that the concept of CBRI differs across groups in meaning and is influenced by a myriad of factors, including racial/ethnic identity development, that were not a part of the original study design. For instance, more research is needed to understand the development and impact of CBRI at the individual level for Latinx people, a diverse ethnic group with diversity in race, skin tone, generational status, language, and other factors that impact racial socialization in the

United States. As previously mentioned, it is important for demographic data to be inclusive of both race and ethnicity to allow for more meaningful intersectional analyses. To this end, future work is needed to examine the utility of the CoBRAS in historically and contemporarily marginalized groups, and across multiple intersecting identities with large datasets.

Additionally, the CoBRAS was developed and disseminated in the early 2000s and there has been considerable sociopolitical change since then that continues and is ongoing. Thus, revisiting the CoBRAS through both qualitative and quantitative methods appears to be needed future empirical work. While outside the scope of this study, better understanding the differential constructs of CBRI across racial/ethnic groups may also provide an important lens by which to investigate the impact of CBRI on health outcomes. For example, the impact of awareness of racism among racial/ethnic minoritized groups has been shown to be protective among Black Americans (Barr, 2014). Alternatively, the espousal of CBRI in non-Latinx White and other White assigned individuals is protective in that it allows for the denial of information about race, racial inequities and racial socialization and maintains the status quo (Frankenberg, 1993). More research is needed to examine item level functioning of the CoBRAS across different racial/ethnic groups as well as other social groups.

Conclusion

The CoBRAS was developed, validated, and tested as a measure to assess denial of racism (e.g., color-blind racial attitudes), such as denying the persistence and impact of racism in the United States. Similar to any self-report measure, the use of the CoBRAS to examine group differences hinges upon the assumption of measurement invariance which has yet to have been established for this measure empirically. There has only been one test of measurement invariance of the CoBRAS in a community sample of Asian and Asian American adults across generational status (Keum et al., 2018). Given the complexity of experiences at the intersection of race/ethnicity and gender, this study provides findings that are a crucial step in understanding the empirical utility of the CoBRAS measure. The central hypothesis of the current study was that the three-factor CoBRAS would be invariant across groups was not supported.

The present study challenges the empirical utility of the original 20-item, three-factor CoBRAS measure. Despite study limitations, this study possessed many strengths, including the first MGCFA of the CoBRAS across race/ethnicity and gender in multiple groups. The lack of invariance (partial scalar invariance that differed) across groups suggests more research is needed to better understand how to measure CBRI quantitatively and raises the question of whether there is a universal experience of CBRI given the complexities of interacting systems of oppression and their subsequent impact on communities and individuals. The field is moving towards more sophisticated and diverse methodology, without addressing the question of whether existing measures are invariant across groups/culturally valid and it remains unclear whether invariance is enough. In the case of the CoBRAS, much is left to examine including what moderates color-blind racial attitudes (e.g., neighborhood factors, experiences of discrimination, racial/cultural identity development), how CBRI influences behavior, decision-making, and health, and how to best overcome CBRI. The insidious nature of racism and how humans internalize racism from an early age calls for translational research to begin to dismantle and decolonize systems that work to oppress people from marginalized groups.

This may start with measures of psychological constructs, like the CoBRAS.

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Tables

Table 1

Sociodemographics of Initial Scale Validation Compared to Present Study

		Race/Ethnicity						
Study	*N*	White	Black	Latinx	Asian	AI/AN	Multi	"Other"
Neville et al. (2000)								
Study 1: Factor structure and initial reliability estimates	302	246 (81%)	24 (8%)	9 (3%)	10 (3%)	3 (<1%)	N/A	12 (4%)
Study 2: Further examination of factor structure and initial validity estimates	594	397 (67%)	111 (19%)	32 (5%)	12 (2%)	5 (1%)	N/A	34 (6%)
Study 3: Examination of test-retest reliability	102	92 (90%)	*(2%)	*(2%)	*(1%)	*(2%)	*(3%)	N/A
Study 4: Further examination of concurrent validity	145	102 (70%)	3 (2%)	28 (19%)	4 (3%)	3 (2%)	N/A	4 (3%)
Study 5: Sensitivity to intervention	28	3 (11%)	7 (25%)	5 (17%)	7 (25%)	1 (3%)	5 (17%)	N/A
Current Study**	911	366 (40.2%)	194 (21.3%)	221 (24.3%)	44 (4.8%)	35 (3.8%)	N/A	38 (4.2%)

Note. AI/AN = American Indian/Alaska Native; percentages preceded by an asterisk, for example *(2%), indicate that sample size was not provided in the Neville et al. (2000) manuscript or supplemental materials; ** study also included Native Hawaiian/Pacific Islander (*n*=13; 1.4%).

Table 2

Predictions of Group Differences Across CoBRAS Factors

	Race/Ethnicity		
Score	White	Black	Latinx
URP	High	Medium	Low
UID	High	Low	Medium
UBR	Medium	High	Low

Note. URP = Unawareness of racial privilege; UID = Unawareness of institutional discrimination; UBR = Unawareness of blatant racism.

Table 3

Participant Baseline Demographic Information (N=911)

Variable	*n*	%	*Mean*	*SD*
Age (years)			21.27	5.21
Gender (Female)	610	67.0		
Race/ethnicity				
Black	194	21.3		
Latinx	221	24.3		
White	366	40.2		
AI/AN*	35	3.8		
Asian	44	4.8		
Native Hawaiian/Pacific Islander	13	1.4		
“Other”	38	4.2		

Note. AI/AN = American Indian/Alaska Native.

Table 4

CoBRAS summary statistics and comparison of mean item

Factors[a]	Item	Mean (SD)	Skewness
RP	1. Everyone who works hard, no matter what race they are, has an equal chance to become rich.	4.26 (1.74)	-0.521
RP	2. **Race plays a major role in the type of social services (such as type of health care or day care) that people receive in the U.S.**	2.91 (1.44)	0.425
ID	3. It is important that people begin to think of themselves as American and not African American, Mexican American or Italian American.	3.59 (1.70)	-0.043
ID	4. **Due to racial discrimination, programs such as affirmative action are necessary to help create equality.**	2.98 (1.35)	0.297
BR	5. **Racism is a major problem in the U.S.**	2.38 (1.31)	0.640
RP	6. **Race is very important in determining who is successful and who is not.**	4.13 (1.69)	-0.431
BR	7. Racism may have been a problem in the past, but it is not an important problem today.	2.33 (1.48)	0.926
RP	8. **Racial and ethnic minorities do not have the same opportunities as White people in the U.S.**	3.05 (1.56)	0.352
ID	9. White people in the U.S. are discriminated against because of the color their skin.	2.97 (1.61)	0.336
BR	10. Talking about racial issues causes unnecessary tension.	3.56 (1.58)	-0.047
BR	11. **It is important for political leaders to talk about racism to help work through or solve society's problems.**	2.53 (1.36)	0.645
RP	12. **White people in the U.S. have certain advantages because of the color of their skin.**	2.65 (1.42)	0.586
ID	13. Immigrants should try to fit into the culture and adopt the values of the U.S.	3.32 (1.39)	0.147
ID	14. English should be the only official language in the U.S.	3.06 (1.72)	0.342
RP	15. **White people are more to blame for racial discrimination in the U.S. than racial and ethnic minorities.**	3.68 (1.58)	-0.151
ID	16. Social policies, such as affirmative action, discriminate unfairly against White people.	2.96 (1.39)	0.395
BR	17. **It is important for public schools to teach about the history and contributions of racial and ethnic minorities.**	2.15 (1.17)	0.894
ID	18. Racial and ethnic minorities in the U.S. have certain advantages because of the color of their skin.	3.33 (1.44)	0.163
	19. Racial problems in the U.S. are rare, isolated situations.	2.35 (1.41)	0.877
RP	20. **Race plays an important role in who gets sent to prison.**	3.12 (1.58)	0.247

Note. [a]Factors from the original factor structure of the CoBRAS; RP = unawareness of racial privilege/factor 1; ID = unawareness of institutional discrimination/factor 2; BR = unawareness of blatant racism/factor 3. Reverse coded items presented in bold.

Table 5

Initial CFAs across full sample and different groups

Model	χ^2	*df*	*CFI*	*TLI*	*RMSEA*	*RMSEA CI_{90}*	*SRMR*
1-Factor	**4737.163***	**171**	**0.545**	**0.495**	**0.189**	**0.184-0.194**	**0.148**
Black	1454.195	171	0.547	0.497	0.202	0.192-0.212	0.173
Latinx	1303.706*	171	0.491	0.435	0.179	0.170-0.188	0.156
White	2466.226*	171	0.508	0.453	0.194	0.187-0.201	0.146
Male	*1501.365**	*171*	*0.537*	*0.486*	*0.188*	*0.179-0.197*	*0.140*
Female	*3926.070**	*171*	*0.536*	*0.484*	*0.186*	*0.181-0.192*	*0.153*
3-Factor**	**3583.427***	**170**	**0.660**	**0.620**	**0.164**	**0.159-0.169**	**0.117**
Black	1182.401*	170	0.643	0.601	0.180	0.170-0.190	0.144
Latinx	994.479*	170	0.630	0.586	0.153	0.144-0.162	0.125
White	1776.406*	170	0.655	0.615	0.163	0.156-0.170	0.116
Male	*1709.473**	*170*	*0.684*	*0.647*	*0.156*	*0.147-0.165*	*0.113*
Female	*2648.065**	*170*	*0.632*	*0.589*	*0.166*	*0.161-0.172*	*0.124*
Bi-Factor	**2081.957***	**149**	**0.808**	**0.755**	**0.132**	**0.127-0.137**	**0.067**
Black	650.834*	149	0.823	0.774	0.135	0.125-0.146	0.085
Latinx	738.617*	149	0.735	0.662	0.138	0.128-0.148	0.084
White	1072.787*	149	0.802	0.747	0.132	0.125-0.139	0.070
Male	*693.289**	*149*	*0.811*	*0.759*	*0.129*	*0.119-0.139*	*0.074*
Female	*1444.765**	*149*	*0.808*	*0.755*	*0.128*	*0.122-0.135*	*0.068*

*p<.001

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean-square error of approximation; SRMR = standardized root mean square. **Both 3-Factor orthogonal and oblique yielded equivalent model fit and Geomin rotation was used for orthogonal 3-factor.

Table 6

CoBRAS EFA pattern matrix

	Component	
Item	1	2
1. Everyone who works hard, no matter what race they are, has an equal chance to become rich.		0.912
2. **Race plays a major role in the type of social services (such as type of health care or day care) that people receive in the U.S.**		0.946
3. It is important that people begin to think of themselves as American and not African American, Mexican American or Italian American.		0.911
4. **Due to racial discrimination, programs such as affirmative action are necessary to help create equality.**		0.862
5. **Racism is a major problem in the U.S.**		0.887
6. **Race is very important in determining who is successful and who is not.**		0.840
7. Racism may have been a problem in the past, but it is not an important problem today.		0.889
8. **Racial and ethnic minorities do not have the same opportunities as White people in the U.S.**		0.883
9. White people in the U.S. are discriminated against because of the color their skin.		0.900
10. Talking about racial issues causes unnecessary tension.		0.912
11. **It is important for political leaders to talk about racism to help work through or solve society's problems.**	0.929	
12. **White people in the U.S. have certain advantages because of the color of their skin.**	0.949	
13. Immigrants should try to fit into the culture and adopt the values of the U.S.	0.907	
14. English should be the only official language in the U.S.	0.928	
15. **White people are more to blame for racial discrimination in the U.S. than racial and ethnic minorities.**	0.897	
16. Social policies, such as affirmative action, discriminate unfairly against White people.	0.923	
17. **It is important for public schools to teach about the history and contributions of racial and ethnic minorities.**	0.948	
18. Racial and ethnic minorities in the U.S. have certain advantages because of the color of their skin.	0.916	
19. Racial problems in the U.S. are rare, isolated situations.	0.949	
20. **Race plays an important role in who gets sent to prison.**	0.949	

Note. Reverse coded items presented in bold.

Table 7

Model Fit Removing CoBRAS Items

Item removed	χ^2	*df*	*CFI*	*TLI*	*RMSEA*	*SRMR*
None	2010.988*	169	0.637	0.592	0.162	0.117
Item 19	2036.463	170	0.571	0.520	0.162	0.135
Item 16	1582.159*	134	0.639	0.588	0.161	0.105
Item 7	1439.709*	118	0.641	0.587	0.164	0.099
Item 13	988.565*	103	0.750	0.708	0.144	0.086
Item 9	749.635*	89	0.813	0.779	0.133	0.075
Item 11	639.225*	76	0.806	0.767	0.133	0.074
Item 1	528.967*	64	0.831	0.794	0.132	0.069
Item 14	349.333*	53	0.891	0.864	0.116	0.057
Item 6	274.704*	43	0.907	0.882	0.114	0.052
Item 3	179.957*	34	0.940	0.910	0.101	0.041
Item 4	118.449*	26	0.957	0.941	0.092	0.037
Item 20	79.031*	19	0.963	0.945	0.087	0.035
Item 10	46.857*	13	0.979	0.965	0.079	0.026
Item 18	41.375*	8	0.979	0.960	0.100	0.025

*p<.001

Table 8

Validation Sample CFA across Race/Ethnicity and Gender

Model	χ^2	*df*	*CFI*	*TLI*	*RMSEA*	*RMSEA CI*$_{90}$	*SRMR*
Race/ethnicity							
Black	31.159*	8	0.976	0.956	0.123	0.079-0.170	0.032
Latinx	25.276*	8	0.978	0.960	0.101	0.058-0.147	0.031
White	51.655*	8	0.975	0.953	0.123	0.092-0.156	0.029
Gender							
Female	53.765*	8	0.982	0.967	0.097	0.073-0.122	0.024
Male	29.296	8	0.982	0.966	0.101	0.063-0.141	0.028

*$p<.001$

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean-square error of approximation; SRMR = standardized root mean square.

Table 9

Tests of Measurement Invariance by Race/Ethnicity and Gender

Model	χ^2 (df)*	CFI	RMSEA	SRMR	$\Delta\ \chi^2$ (df)	ΔCFI	ΔRMSEA	ΔSRMR
Race/Ethnicity								
Configural	106.409 (24)	.977	.116	.030	-	-	-	-
Scalar	549.225 (90)	.869	.142	.054	443.115 (66)	.108	-.026	-.024
Latinx-White								
Configural	75.034 (16)	.977	.113	.030	-	-	-	-
Scalar	142.850 (52)	.964	.078	.041	95.304 (52)	.013	.035	-.011
Partial Scalar	70.432 (22)	.981	.088	.036	14.724 (6)	-.004	.025	-.006
Black-White								
Configural	81.923 (16)	.976	.122	.030	-	-	-	-
Scalar	479.440 (52)	.843	.173	.060	382.753 (36)	.133	-.051	-.03
Partial Scalar	112.107 (22)	.967	.122	.043	38.683 (6)	.009	0	-.005
Black-Latinx								
Configural	56.269 (16)	.977	.122	.031	-	-	-	-
Scalar	196.917 (52)	.918	.118	.048	147.596 (36)	.059	.004	-.017
Partial Scalar	49.777 (27)	.984	.079	.035	8.342 (6)	-.007	.043	-.004
Gender								
Configural	57.703 (16)	.983	.106	.028	-	-	-	-
Scalar	136.071 (46)	.963	.092	.039	92.044 (30)	.02	.014	-.011
Partial Scalar	57.789 (22)	.985	.084	.034	14.190 (6)	-.002	.022	-.006

Note. *Chi-square tests significant at p<.001; Race/Ethnicity = Inclusive of all three racial/ethnic groups.

Table 10

Descriptive Statistics of CoBRAS and cross-cultural variables

	Race/Ethnicity			*Gender*	
	Black (N=178)	Latinx (N=199)	White (N=344)	Female (N=498)	Male (N=205)
CoBRAS					
Factor 1	6.98 (2.93)	8.43 (2.91)	9.25 (3.25)	8.24 (3.19)	8.99 (3.15)
Factor 2	6.82 (2.96)	8.17 (3.19)	9.16 (3.49)	8.02 (3.40)	8.99 (3.42)
MEIM					
Affirmation/Belonging	3.43 (0.62)	3.29 (0.69)	2.87 (0.70)	3.18 (0.71)	2.98 (0.76)
Ethnic Behaviors	2.88 (0.77)	2.67 (0.75)	2.42 (0.79)	2.63 (0.79)	2.56 (0.78)
AMAS-ZABB					
U.S. Identity	3.34 (0.75)	3.68 (0.57)	3.62 (0.63)	3.58 (0.64)	3.54 (0.71)
Ethnic Identity	3.54 (0.69)	3.34 (0.83)	3.21 (0.67)	3.37 (0.70)	3.23 (0.80)
LVS					
Cultural Pride	2.81 (0.48)	2.76 (0.49)	2.52 (0.53)	2.70 (0.52)	2.54 (0.53)
Familismo	3.09 (0.60)	3.08 (0.58)	2.79 (0.57)	2.97 (0.60)	2.87 (0.58)
HVICS					
Vertical individualism	4.62 (1.64)	5.00 (1.57)	5.04 (1.57)	4.62 (1.55)	5.69 (1.50)
Vertical collectivism	5.71 (1.54)	5.71 (1.36)	5.38 (1.45)	5.51 (1.46)	5.65 (1.46)
Horizontal individualism	7.17 (1.51)	7.27 (1.14)	6.96 (1.11)	7.15 (1.27)	6.99 (1.16)
Horizontal collectivism	6.57 (1.45)	7.02 (1.27)	6.78 (1.32)	6.88 (1.36)	6.56 (1.31)

Note. CoBRAS = Color-Blind Racial Attitudes Scale; MEIM = Multigroup Measure of Ethnic Identity; AMAS-ZABB = Abbreviated Multidimensional Acculturation Scale; LVS = Latino/a Values Scale; HVICS = Horizontal and Vertical Dimensions of Individualism and Collectivism Scale.

Table 11

Internal Consistency Reliability estimates across groups

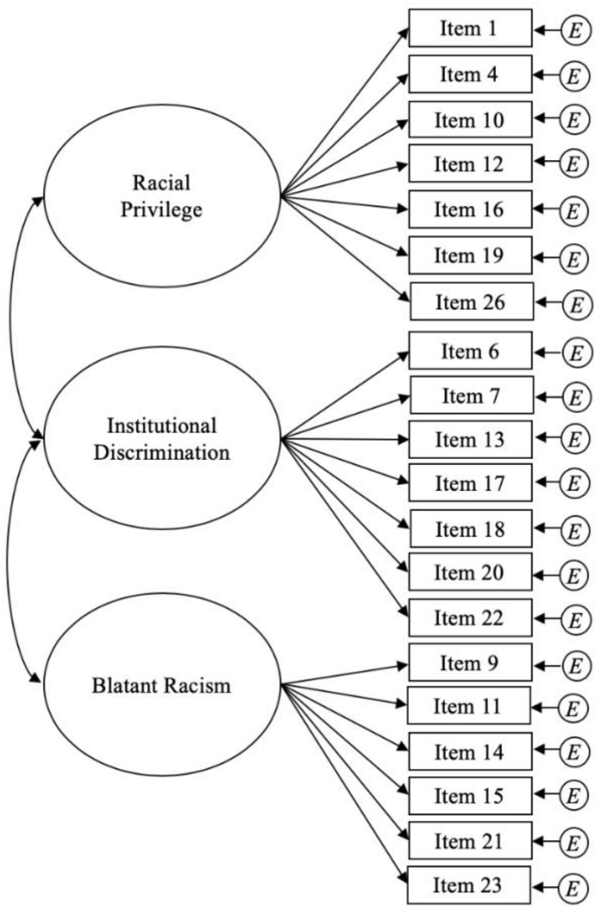
		Race/Ethnicity			*Gender*	
	Total	Black	Latinx	White	Female	Male
CoBRAS						
Factor 1	0.619	0.575	0.578	0.615	0.598	0.606
Factor 2	0.708	0.633	0.667	0.697	0.682	0.703
MEIM						
Affirmation/Belonging	0.892	0.901	0.893	0.861	0.890	0.894
Ethnic Behaviors	0.538	0.515	0.587	0.535	0.512	0.566
AMAS-ZABB						
U.S. Identity	0.941	0.936	0.944	0.940	0.940	0.942
Ethnic Identity	0.927	0.942	0.954	0.899	0.918	0.936
LVS						
Cultural Pride	0.842	0.762	0.831	0.861	0.836	0.839
Familismo	0.818	0.853	0.804	0.782	0.829	0.796
HVICS						
Vertical individualism	0.851	0.835	0.840	0.866	0.842	0.835
Vertical collectivism	0.834	0.847	0.801	0.841	0.829	0.855
Horizontal collectivism	0.867	0.858	0.863	0.872	0.868	0.859
Horizontal individualism	0.867	0.915	0.842	0.833	0.877	0.837

Note. CoBRAS = Color-Blind Racial Attitudes Scale; MEIM = Multigroup Measure of Ethnic Identity; AMAS-ZABB = Abbreviated Multidimensional Acculturation Scale; LVS = Latino/a Values Scale; HVICS = Horizontal and Vertical Dimensions of Individualism and Collectivism Scale.

Figures

Figure 1

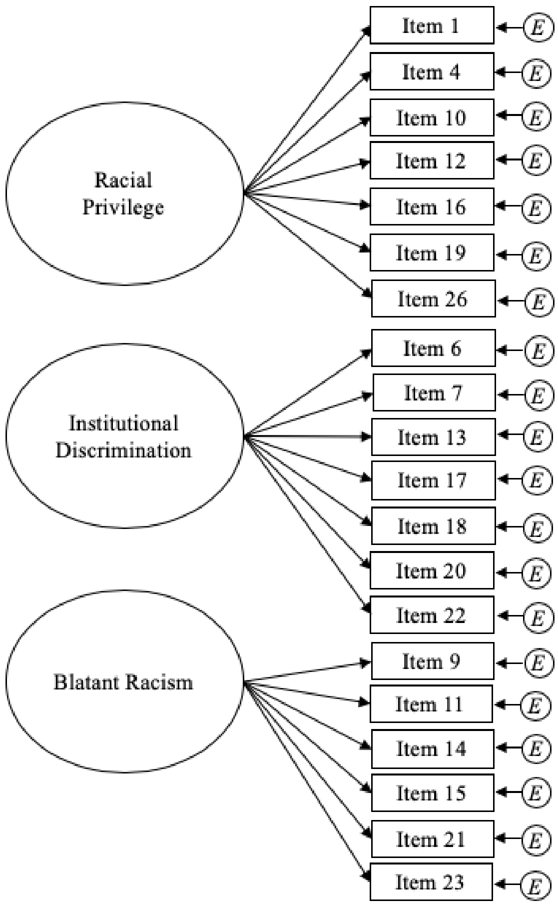
Oblique (Correlated) Three-Factor Model of the CoBRAS



Note. The above model was derived from Neville et al. (2000) initial factor validation and reliability analysis. Cross-loadings of items not specified in the figure.

Figure 2

Orthogonal Three-Factor Model of the CoBRAS



Note. The above model was derived from Neville et al. (2000) initial factor validation and reliability analysis. Cross-loadings of items not specified in the figure.

Figure 3

General (One-)Factor Model of the CoBRAS

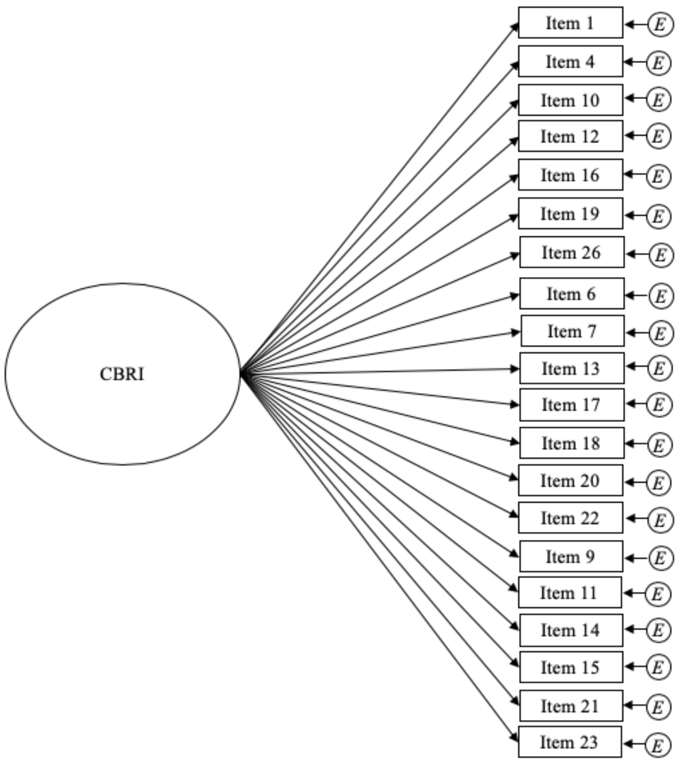
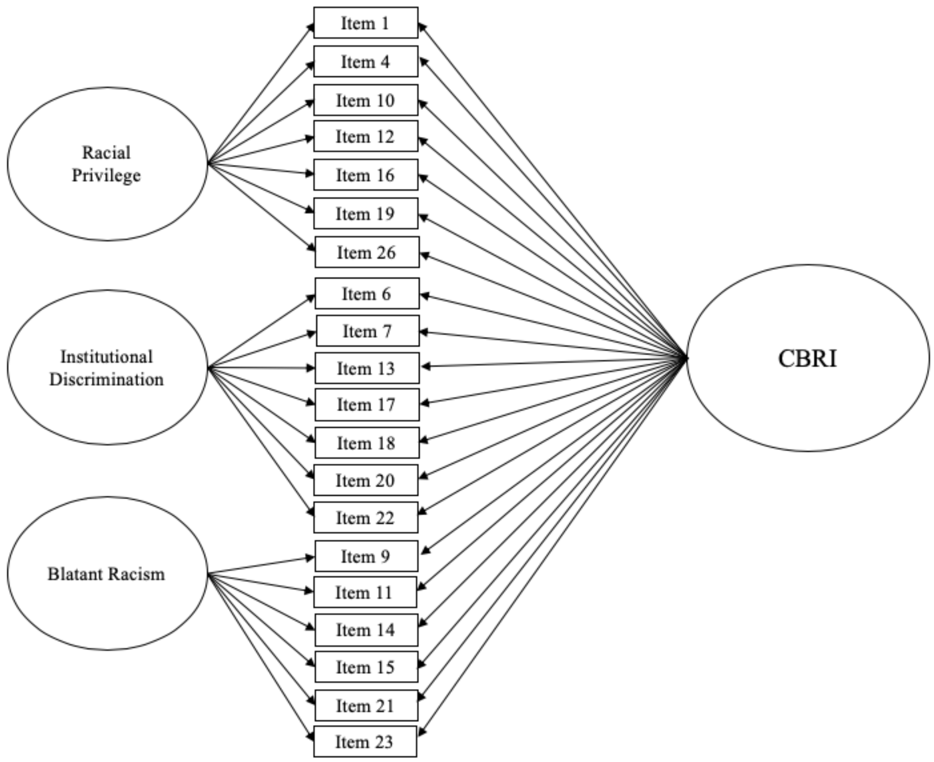


Figure 4

Bifactor Model of the CoBRAS



Note. The above model was specified in Keum et al. (2018) examination of model fit in a sample of 344 Asian American individuals. The general factor is specified as orthogonal to the three factors, and the three factors are orthogonal to each other.

Figure 5

Horizontal and Vertical Dimensions of Individualism and Collectivism Scale Dimensions

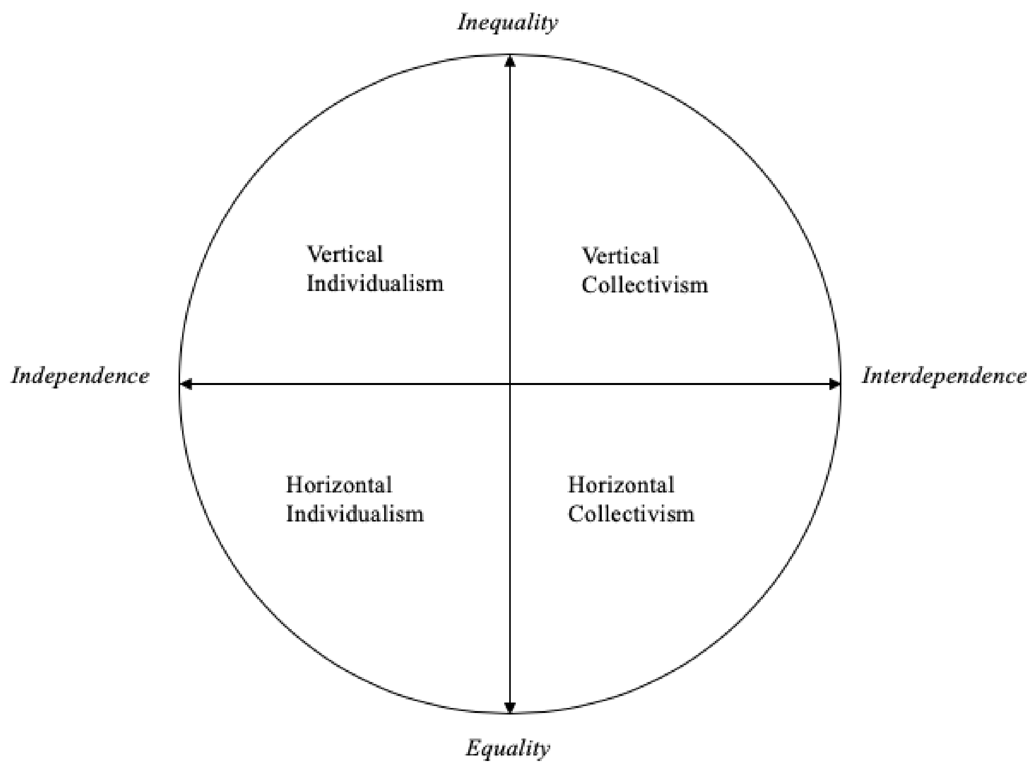


Figure 6

Six-Item Two-Factor CoBRAS Model

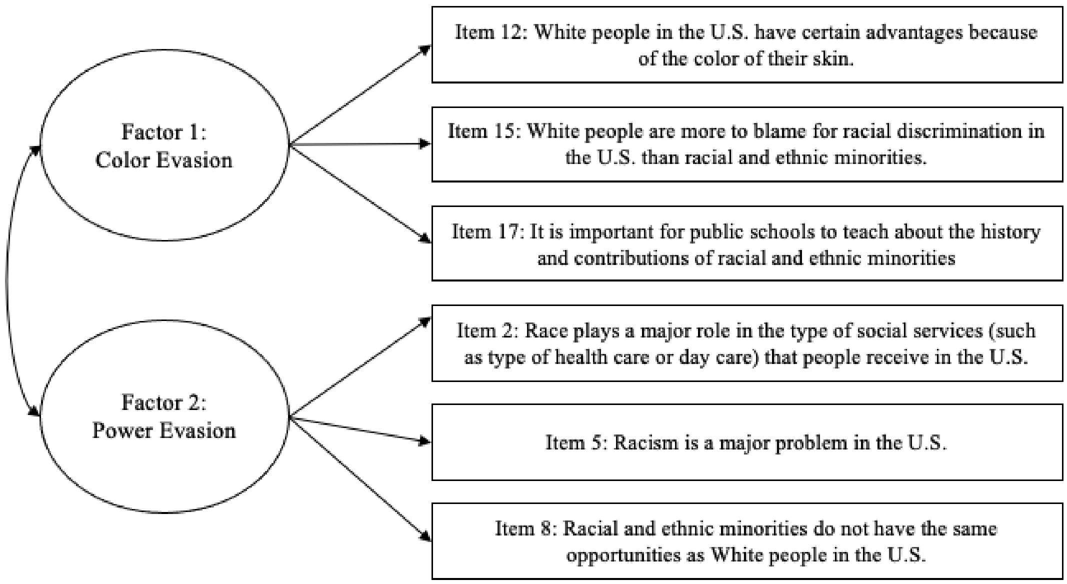


Figure 7

Factor Loadings and Factor Correlations for Black Participants

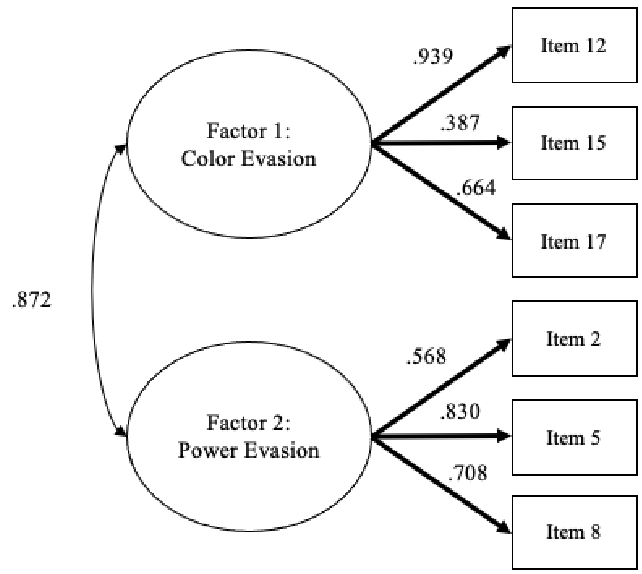


Figure 8

Factor Loadings and Factor Correlations for White Participants

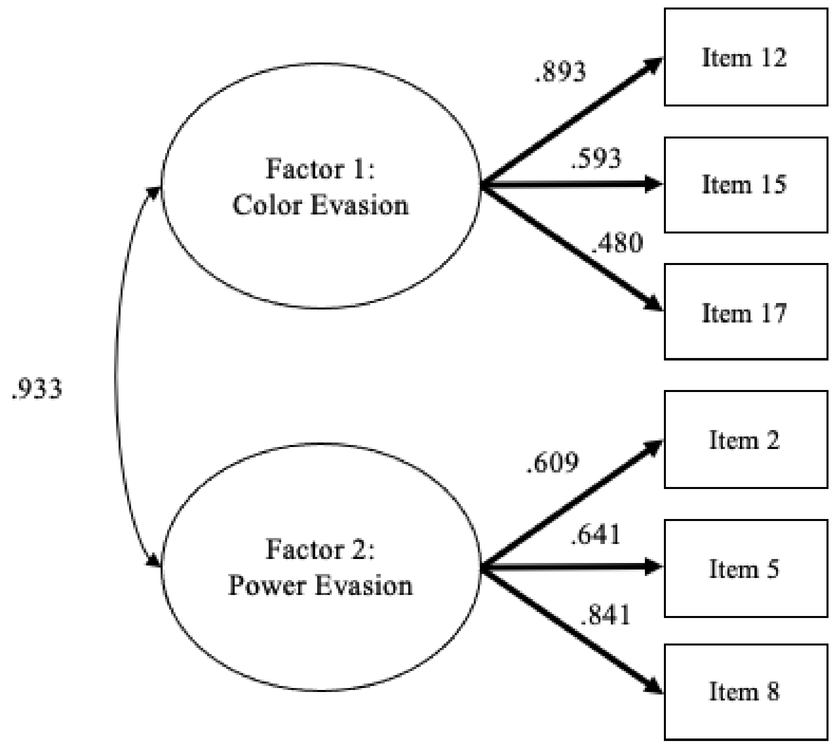


Figure 9

Factor Loadings and Factor Correlations for Latinx Participants

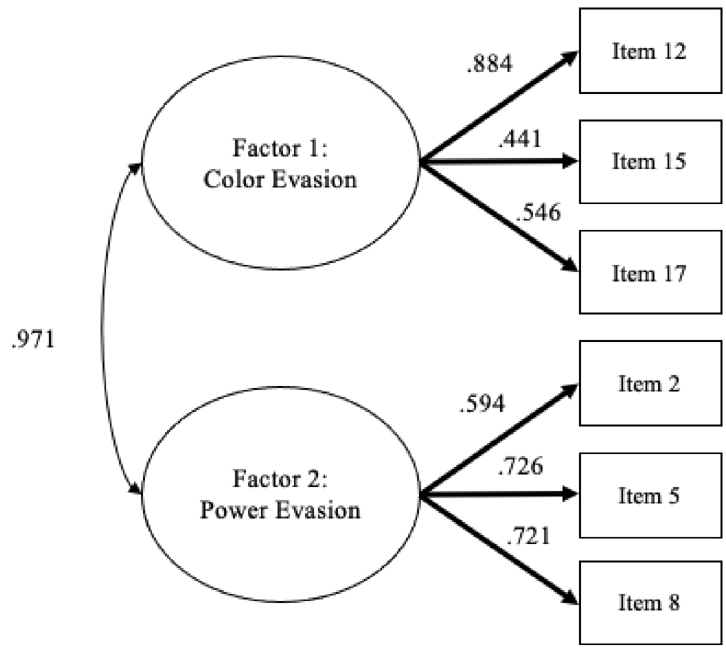


Figure 10

Factor Loadings and Factor Correlations for Gender