

Validation of the Asian American Racism-Related Stress Inventory for Asian Indians

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The Asian American Race-Related Stress Inventory (AARRSI; Liang et al., 2004) is a measure of racism-related stress specific to Asian Americans in the United States. This scale was later adapted by Tummala-Narra et al. (2011) to be culturally attuned to the Asian Indian experience of racism-related stress. In this article, we tested a measurement model for the adapted scale for AARRSI-Asian Indians. In Study 1, an exploratory factor analysis yielded a 16-item scale with three subscales of Sociohistorical Racism, General Stereotype, and Perpetual Foreigner consistent with the original AARRSI scale. In Study 2, a confirmatory factor analysis evidenced the best fit for a correlation model with a 15-item scale and measurement invariance across generational statuses. The data also supported adequate convergent and divergent validity for AARRSI-Asian Indians. In conclusion, we discuss implications from the data, including how Asian Indians may uniquely appraise and experience racism, as well as the importance of generational status within this population.

What is the public significance of this article?

Asian Indians are one of the largest immigrant groups in the United States. However, there are no tools to measure Asian Indian-specific experience of racism-related stress. In this research study, we validate a measurement scale specific to Asian Indians and discuss its importance for research, practice, and education.

Keywords: racism-related stress, measurement model, Asian Indians, prejudice, mental health

According to the Pew Research Center, the Asian Indian population in the United States has doubled since 2000 and is the third largest group of immigrants (Ruiz, 2018). As per one estimate, about 4.6 million Asian Indians are living in the United States (Budiman & Ruiz, 2021). Like many other racial-ethnic minority groups, this population has been a target of racism. Racism is a form of oppression based on the assumption that phenotypic differences (e.g., skin color) are indicative of significant biological differences among individuals. Within racism, White individuals are framed

as the superior phenotype and thus awarded greater value and opportunity. Racial-ethnic minority groups like Asian Indian individuals are unfairly disadvantaged, have negative stereotypes associated with them, and are subject to interpersonal and structural discrimination (American Psychological Association's Task Force on Race and Ethnicity Guidelines in Psychology, 2019). The history of racism against Asian Indians in the United States began as early as the 1900s, with the U.S. government introducing legislation to prevent further immigration from India (C. Patel, 2018). More contemporarily, racism is still a prevalent experience in the community (Inman et al., 2015; Tummala-Narra et al., 2012). In fact, given the sociopolitical climate and the anti-immigrant rhetoric, South Asian Americans Leading Together found that hate crimes against South Asians (individuals from India, Bangladesh, Nepal, Sri Lanka, Pakistan, Bhutan, Maldives, and Afghanistan) increased by 64% in the first year of President Trump's term (South Asian Americans Leading Together, 2018). Despite the prevalence of racism in the community, there has been a lack of attention to the unique experiences of Asian Indians in literature, especially in having reliable and valid population-specific measures (Inman et al., 2015; Tummala-Narra et al., 2012).

Erasure of South Asians

Race discourse in the United States is often reduced to a "two-tiered system" with Black people at one end and White people at the

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other (Liang et al., 2004). This leaves many other racial groups, like Latinx individuals and Asian Americans, outside this discourse. To further complicate the matter, South Asians are not always considered Asian by others even though they consider themselves as belonging to the “Asian” group (Lee & Ramakrishnan, 2020; Mody et al., 2018). South Asians are erased or excluded from the “Asian American” category because the term “Asian” is associated with East Asian phenotypes. This exclusion is evident in mainstream discourse, where hate crimes against South Asians are not considered “anti-Asian” hate (P. Kurien & Purkayastha, 2024), as well as in psychological literature (e.g., Liang et al., 2004). Others have noted that the racialization of South Asians is more like Arab Americans and Muslim Americans, as was evidenced by the increase in hate crimes toward South Asians after 9/11 (Maira & Shihade, 2006). Additionally, South Asians may also be invisibilized because their successes may overshadow their experiences of racism (Kaduvettoor-Davidson & Inman, 2013), like East Asians (Yoo et al., 2010). As a model minority, South Asians often outperform other Asian American individuals in academic, social, and professional realms (Daga & Raval, 2018). Mudambi (2019) noted that the higher status South Asian Americans enjoy comes at a price, that of “racial discrimination, glass ceilings, and underemployment” (p. 4). As such, despite their experiences of racism, South Asians are largely invisible. In the present study, we highlight and center the unique racism-related experiences of Asian Indians and aim to contribute to increasing visibility more generally for South Asians in the psychological literature.

Racialization of Asian Indians

The confusion and complexity of Asian Indian racialization in the United States is seen in the shifts in their racial categorization. Asian Indians have been categorized as “non-White,” “White,” “Hindu,” “Asiatic Indian,” “Asian Indian,” and “Asian” in the U.S. census. Between 1960 and 1980 alone, Asian Indians were classified in three differing ways: “non-White,” then “White,” and then “Asian” (P. Kurien & Purkayastha, 2024). These shifting racial categorizations reflected the immigration and racial policies of the time and the role Asian Indians played in relation to these policies. Harpalani (2013) identified the early 1900s as the first time period when immigrants from South Asia arrived on the west coast of the United States. These immigrants were students and laborers, and many were from the Sikh religious community. Although there was racial ambiguity in that South Asians were seen by some as White, they were ultimately racialized with other Asians as “foreigners” and part of the “Yellow Peril,” and lobbyists successfully prevented further immigration (Harpalani, 2013). For the immigrants who were in the United States before the immigration exclusion acts, racism became evident in the process of seeking citizenship. Asian Indians also influenced racial and ethnic categorization in the United States. For example, in a historical Supreme Court Case in 1923, a caste-dominant, Asian Indian Sikh man claimed citizenship based on his “Aryan” and “Caucasian” lineage that deemed him to be “a free white person.” His case was denied with the reasoning that though he was racially “White,” he was not considered so in the “eyes of the common man” (Koshy, 1998). This case went on to influence how the United States constructed “whiteness” in its census.

Relatedly, another important consideration is the context of varied trajectories of immigration of Asian Indians to the United

States. For example, Asian Indians who immigrated from the mid-60s into the 80s through the Immigration Act of 1965 on the heels of the Civil Rights Movement were largely caste, class, and educationally privileged Indians who qualified under the “professional class” of immigrants in the United States was seeking (P. A. Kurien, 2005). Additionally, these immigrants’ families were also given preference in immigrating to the United States, thereby being able to establish communal and family-based networks. Subsequently, these immigrants were uniquely positioned to accumulate social, political, and economic capital compared to disenfranchised racial and ethnic groups in the United States (P. A. Kurien, 2005). These immigrants were also considered “Model Minorities” and “white adjacent” in their racial positioning. By contrast to the earliest immigrants, another larger wave of immigrants has been able to immigrate to the United States through the Immigration Act of 1990 as a “skilled class” of immigrants through employment-sponsored visas (Harpalani, 2013). These waves of immigration remain ongoing, with most Asian Indians immigrating via the education or employment route to the United States. Compared to the earlier groups, later immigrants have had stricter limits on securing permanent residency, sponsoring family members to immigrate, and less job security (Bhattacharya & Schoppelrey, 2004). As such, within the U.S. racial climate and subsequent immigration policies, Asian Indian immigrants have played different roles and may have differing experiences of racism and racism-related stress.

Racism Toward Asian Indians

As noted, immigration for South Asian individuals has been restricted at times and less restricted at others, providing evidence of institutional and systemic racism mediating these restrictions. Beyond these restrictions, Inman et al. (2015) also highlighted the historical racism in “anti-miscegenation laws, religious prejudice, and restrictions in land ownership” (p. 220). In the contemporary United States, a flashpoint for racism against South Asians was the 9/11 terrorist attacks in New York City, which incited significant hate against the community (Kaduvettor-Davidson & Inman, 2013). Due to the categorizing and stereotyping of “brown Muslim terrorists,” individuals of South Asian and/or Arab descent were targets of discrimination, especially those who were a visible minority. For example, the first victim of hate crime following 9/11 was Balbir Singh Sodhi, a Sikh man who was murdered in Arizona by Frank Roque, who wanted to “kill a Muslim.” The idea of “threat” has continued to be associated with South Asians post-9/11 (De, 2016). High-profile hate crime cases include the murders of Srinivas Kuchibhotla and Deep Rai (Maizland, 2017). Other experiences of racism in the Asian Indian community include being searched while traveling, being told to go back to one’s country, racial profiling by law enforcement, having one’s accent made fun of, and race negatively impacting friendship and romantic relationships (Aggarwal, 2023; Inman et al., 2015; Tummala-Narra et al., 2024).

Research on experiences with racism also showcases how experiences can be different based on individuals’ unique social location. As stated above, 9/11 led to increased hate toward South Asians and, in particular, Muslims and Sikhs. Thus, those who visibly identify with religious faith backgrounds may be at an increased risk for discrimination (Inman et al., 2015). Data on generational status

are mixed, with some studies providing evidence for greater racism-related stress for first-generation Asian Indians and other studies providing evidence that second-generation Asian Indians may be more distressed when facing racism (Inman et al., 2015). Prior research has found that first-generation Asian Indians tend to have a lower salience of racial-ethnic identity than other generational groups. The first-generation group is more likely to be socialized with oppressive ideology around caste, skin color, and race from their preimmigration contexts in postcolonial India and that internalized colonial mentality may lead to minimization and lower salience of race and racism-related experiences (Tummala-Narra et al., 2024). In contrast, Tummala-Narra et al. (2011) argued that for first-generation Asian Indians, experiencing racism over time makes race more prominent. On the other hand, in the second-generation group, individuals are exposed to and learn about race and racism growing up. They, therefore, are better able to recognize and resist these messages (Tummala-Narra et al., 2024). Moreover, racial-ethnic socialization also impacts how Asian Indians appraise and respond to experiences of discrimination. Specifically, while Asian Indian American families socialize children to have ethnic pride, socialization practices do not directly address how to handle experiences of discrimination (P. Patel et al., 2023). Additionally, within first-generation immigrants, other variations may also exist based on the circumstances of their immigration. However, interestingly, these differences between generational groups do not always achieve significance in quantitative examinations (Kaduvettoor-Davidson & Inman, 2012; Tummala-Narra et al., 2011). As such, generational status is an important consideration in racism-related stress for Asian Indians.

Being a target of discrimination and racism is significantly related to perceived stress, self-esteem, and depression in South Asian Americans (Kaduvettoor-Davidson & Inman, 2013; Tummala-Narra et al., 2011, 2012). In a qualitative study with five Indian American Sikh men post-9/11, participants shared how experiences of oppression led to hypervigilance and fears of being attacked (Ahluwalia & Pelletiere, 2010). Inman et al. (2015) conducted focus groups with 50 first-generation Asian Indians, who shared feelings of “helplessness, sadness, anger, and anxiety” about the race-based discrimination they experienced (p. 230). India also has a history of British colonization, which facilitates internalized oppression and minimization of racist experiences (Nikalje & Çiftçi, 2023). Racism impacts psychological functioning, and therefore, to understand the impact, we must first be able to understand the specific racism that Asian Indian communities face using culturally relevant measures.

Asian American Racism-Related Stress Inventory

The Asian American Racism-Related Stress Inventory (AARRSI) was the first measure of racism specific to Asian populations in the United States (Liang et al., 2004). AARRSI was specifically developed to address the racial erasure of Asians, the invisibility of racial discrimination due to the model minority myth, and to highlight how experiences with racism do impact levels of psychological stress for Asian American individuals (Liang et al., 2004). Since its publication, AARRSI has been used to study the impacts of racism-related stress on rates of anxiety and depression (Liu & Suyemoto, 2016), coping (Liang et al., 2007, 2009), self-esteem (Liang & Fassinger, 2008), and much more. Though AARRSI

is a robust measure of racism-related stress for Asian Americans, some items on the scale are specific to East Asian experiences. For example, scale items refer to culturally specific phenomena like being asked to teach karate or being compared to Connie Chung (Liang et al., 2004). These specific experiences would not apply to Asian Indians, thus necessitating modification. Tummala-Narra et al. (2011) modified the original AARRSI to the AARRSI-Asian Indian (AARRSI-AI) through consultation with South Asian team members and a pilot study with six Asian Indians to fit the Asian Indian experience. Changes involved modifying scale items to refer to Asian Indians rather than Asian/Asian Americans, deleting seven culturally irrelevant items (e.g., related to karate), and adding 10 new items reflecting culturally specific experiences for Asian Indians. Some examples of culturally relevant items that were added include “Someone tells you that the British helped to civilize Indians,” “Someone tells you that Indian food smells or tastes bad,” and “Someone asks you if you are planning to go back and live in India.” Tummala-Narra et al. (2011) assessed the modified scale using an exploratory factor analysis (EFA) using principal components analysis and found no evidence for an underlying factor structure. No further analyses were conducted.

The Present Study

Given the unique racial positioning and racialization of Asian Indians among Asian Americans and in relation to the United States and historical and contemporary experiences of racism, there is a need for valid and reliable measures of racism for Asian Indians. Therefore, the present study aimed to validate a modified version of the AARRSI for Asian Indians by identifying the factor structure and measurement model and establishing the validity of the scale. The research questions addressing these aims are (a) What is the factor structure for the AARRSI-AI, and how does it compare to the original AARRSI? (b) Does the AARRSI-AI demonstrate measurement invariance across generational statuses? and (c) To what extent do the scores on AARRSI-AI demonstrate convergent and divergent validity?

Study 1: EFA

Participants and Procedure

The sample for Study 1 was part of another larger study conducted by the first author where AARRSI-AI was used. The sample for the original study was recruited through online postings through professional listservs, social media (e.g., Facebook), as well as through emails sent from the University registrar’s office to students at a Midwestern University campus. The eligibility criteria for the study were participants who were 18 years of age or older, identified as Asian Indian or Asian Indian American, and currently living in the United States. This sample consisted of 193 participants. Participants ranged in age from 18 to 58, with a mean age of 25.36 years ($SD = 7.0$). Most participants were second generation ($n = 101$, 52.3%), followed by first generation ($n = 52$, 26.9%), then 1.5 generation ($n = 39$, 20.2%), and one participant identified as third generation. Participants were largely women ($n = 117$, 60.2%) and then men ($n = 76$, 39.4%). Participants were located across the country: Midwest ($n = 82$, 42.5%), Northeast ($n = 42$, 21.8%), West ($n = 37$, 19.2%), Southeast ($n = 28$, 14.5%), and Southwest ($n = 4$, 2.1%). Most

participants had a master's degree ($n = 57$, 29.5%) or a bachelor's degree ($n = 46$, 23.8%); others had completed some college ($n = 37$, 19.2%), doctorate or professional degree ($n = 19$, 9.8%), and one participant completed less than high school.

Measures

AARRSI-AI

Participants completed the AARRSI-AI version as modified in a previous article by Tummala-Narra et al. (2011). The authors modified the 29-item AARRSI (Liang et al., 2004) to be culturally relevant for Asian Indians. The original 29-item scale includes three factors: sociohistorical racism, "Someone tells you that Asian Americans are not targets of racism"; stereotypes, "A student you do not know asked you for help in math"; and perpetual foreigner, "You are told you speak English so well." Items were rated on a 5-point Likert scale from 1 (*this has never happened to me or someone I know*) to 5 (*this event happened and I was extremely upset*). Tummala-Narra et al. (2011) used the total score of the AARRSI as a measurement of racism-related stress due to a lack of evidence of the factor structure of the modified AARRSI-AI. The scale was found to have high reliability ($\alpha = .93$). The AARRSI-AI was used in another study with Asian Indian international students and found to be negatively correlated with colorblind racial ideology and found to have high reliability ($\alpha = .90$; Aggarwal & Çiftçi, 2021).

Demographic

Participants also completed a questionnaire with demographic information such as their age, gender, generational status, and region of the United States they lived in.

Results

Of the total of 193 participants, one participant had more than 50% of missing data and was deleted from the sample. No outliers were detected. Parallel analysis indicated retaining four factors with the following eigenvalues: 11.68, 1.51, 1.06, and 0.83. Sample size adequacy was determined with Kaiser-Meyer-Olkin test of sampling adequacy (0.89) and Bartlett's test of sphericity ($p < .001$). The four-factor solutions showed only two items loading on it and did not meet the minimum number of items required for a stable factor. Therefore, a four-factor solution was not considered viable, and we tested a three-, two-, and one-factor model. The one-factor model explained 36% of the variance, with all factor loadings ranging from 0.73 to 0.44. The two-factor model explained 40% of the variance, with factor loadings ranging from 0.83 to 0.42 on Factor 1 and 0.81 to 0.43 on Factor 2. However, the factors lacked conceptual clarity. The three-factor model offered the best fit and closely fit the original AARRSI scale, explaining a total of 44.50% variance. Items with significant cross-loading of 0.32 or greater were deleted, or low loadings below 0.40, and items were assessed for meaningfulness for each of the factors. Thus, a total of 16 items were retained. Factor 1 explained 34.80% variance, Factor 2 explained an additional 5.50% variance, and Factor 3 explained the remaining 4.56% variance. Correlation between the three factors ranged from .57 to .67. Factor 1 (seven items, $\alpha = .84$) was named sociohistorical racism, Factor 2 (seven items, $\alpha = .77$) was named general

stereotype, and Factor 3 (five items, $\alpha = .76$) was named perpetual foreigner consistent with the original AARRSI scale (Table 1).

Study 2: Confirmatory Factor Analysis

Participants and Procedure

The sample for Study 2 was collected after institutional review board approval from the authors' institution. A total of 303 participants took part in the study. Participants who met the screening criteria (age 18 years or older, identify as Asian Indian or Asian Indian American, and currently living in the United States) and completed all items on the AARRSI-AI were included. Therefore, a total of 301 participants were included in the sample, and two were

Table 1

Factor Loadings for the Exploratory Factor Analysis ($N = 193$) and Confirmatory Factor Analysis ($N = 301$)

Item	Study 1			Study 2		
	F1	F2	F3	F1	F2	F3
2. You hear that Asian Indians are not significantly represented in management positions.	.77			.72		
10. You learn that Asian Indians historically were targets of racist actions.	.66			.73		
1. You hear about a racially motivated murder of an Asian Indian person.	.65			.49		
3. You are told that Asian Indians have assertiveness problems.	.63			.60		
9. You hear about an Asian Indian scientist not receiving credit for his/her contributions to a major research project while his/her non-Asian Indian coworkers receive credit for this work.	.59			.59		
11. You learn that most non-Asian Indians are ignorant of the oppression and racial prejudice Asian Indians have endured in the United States.	.56			.77		
7. You notice that U.S. history books offer no information of the contributions of Asian Indians.	.55			.70		
17. Someone tells you that they heard that there is a gene that makes Asian Indians smart.	.70			.65		
16. A student you do not know asks you for help in math or science.	.68			.67		
24. Someone tells you that "you people are all the same."	.60			.76		
25. Someone tells you that all Asian Indians are cheap.	.56			.65		
23. Someone asks you if you pray to lots of different gods.	.54			.76		
28. You are told that "you speak English so well."		.68			.60	
29. Someone tells you that they cannot pronounce your name.		.66			.68	
19. Someone asks you if you are planning to go back to live in India.		.63			.49	
30. You are asked where you are really from.		.59			.76	

Note. F1 = sociohistorical racism; F2 = general racism; F3 = perpetual foreigner racism.

removed as they completed less than five items on the AARRSI-AI scale. Participants ranged in age from 18 to 53 with a mean age of 24.38 years ($SD = 6.66$) with gender identification of genderqueer or nonbinary ($n = 4$, 1.33%), men ($n = 144$, 47.84%), and women ($n = 153$, 50.83%). Generational status of first generation ($n = 149$, 49.5%), 1.5 generation ($n = 34$, 11.3%), and second generation ($n = 118$, 39.2%). Most participants were in the Midwest ($n = 182$, 60.5%), followed by the West ($n = 53$, 17.6%), Northeast ($n = 38$, 12.5%), Southeast ($n = 16$, 5.3%), and Southwest ($n = 11$, 3.7%). Participants were mostly college-educated with a bachelor's degree ($n = 147$, 48.8%), master's degree ($n = 76$, 25.2%), doctorate or professional degree ($n = 34$, 11.3%), or a 2-year college degree ($n = 15$, 5%).

Measures

Participants completed the AARRSI-AI scale and demographic information along with the measures described below.

Schedule of Racist Events Scale (Landrine & Klonoff, 1996)

The Schedule of Racist Events (SRE) is an 18-item self-report scale that assesses the frequency and stress of racist discrimination. The SRE and AARRSI both measure the frequency of experiences with racism, as well as how stressful they are, allowing us to compare scores for convergent validity. Participants rate each item three times: (i) the frequency in the past year, (ii) the frequency in their entire lives, and (iii) the level of stress they experienced. Responses are reported on a 6-point scale ranging from 1 (*never happened*) to 6 (*happened >70% of the time*). Among Asian Americans, the scale has a Cronbach's α value of .84 for the SRE-Recent Racist Events subscale, .88 for the SRE-Lifetime Racist Events subscale, and .89 for the SRE-Appraised Racist Events subscale (Liang et al., 2004). This sample included about 20% Asian Indian participants. The scale is positively and significantly correlated with stress-related and somatic symptoms, feelings of inadequacy, and low self-esteem (Landrine & Klonoff, 1996). For this study, we modified questions to replace "Black" with "Asian Indian."

Perceived Stress Scale (Cohen et al., 1994)

The Perceived Stress Scale (PSS) is a 14-item tool used to measure the degree to which individuals perceive life events as stressful. AARRSI-AI and PSS both measure levels of stress, and scores can be compared for convergent validity. Items on the PSS focus on how unpredictable, uncontrollable, and overloaded respondents perceive their lives to be over the past month. Sample items include "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you felt that you were unable to control the important things in your life?" Items are scored on a 5-point scale ranging from 0 (*never*) to 4 (*very often*). The PSS has good reliability (Cronbach's α above .84) and is positively correlated with depressive and physical symptomatology and social anxiety (Cohen et al., 1983). Among Chinese patients in cardiac outpatient clinics in Hong Kong, the PSS' positive and negative subscales had Cronbach's α values of .86 and .77 (Leung et al., 2010). Among Indian medical students and interns, the PSS had a Cronbach's α value of .79 (Chakraborti et al., 2013).

Asian American Values Scale—Multidimensional (Kim et al., 2005)

The Asian American Values Scale—Multidimensional (AAVS-M) is a 42-item tool measuring six value dimensions that differentiate values between Asian Americans and European Americans values. We argue that values one might hold related to racial-ethnic identity are distinct from experiences and stress related to discrimination. While AARRSI-AI has culturally specific items, these items are related to discriminatory behaviors others might exhibit rather than internal values one holds oneself. Thus, AAVS-M functions as a divergent validity measure in our study. There are five components: collectivism, conformity to norms, emotional self-control, family recognition, and humility. Sample items include "one's personal needs should be second to the needs of the group" and "conforming to norms provides order in the community." Items are scored on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The AAVS-M has strong internal reliability in a sample of Asian American college students (4.8% of the sample identified as Asian Indian), with Cronbach's α of .89. For the five subscales, Cronbach's α were .82 (collectivism), .78 (conformity to norms), .82 (emotional self-control), .90 (family recognition), and .75 (humility). The scale demonstrated discriminant validity by a lack of correlation between the Social Desirability Scale and AAVS-M total and subscale scores (Kim et al., 2005). Among a sample of Asian Indian adults in the United States, the AAVS-M was shown to have a high Cronbach's α of .89 for the total scale (Mukkamala, 2009).

Depression, Anxiety and Stress Scale–21 (Coker et al., 2018)

The Depression, Anxiety and Stress Scale–21 (DASS–21) was developed from the 42-item DASS to assess symptoms of depression, anxiety, and stress. Frequency and experiences of racism-related stress are consistently linked to outcomes related to depression, anxiety, and general stress (Carter et al., 2019; Paradies et al., 2015). Items are reported on a 4-point scale ranging from 0 (*did not apply to me at all—never*) to 3 (*applied to me very much, or most of the time—almost always*). Sample items include "I couldn't seem to experience any positive feeling at all" and "I found it difficult to work up the initiative to do things." The DASS-21 has strong reliability with Cronbach's α of .81 (depression), .89 (anxiety), and .78 (stress) on the three subscales. In a sample of Pakistani participants, the scale was significantly and negatively correlated with positive mental health; specifically, lower depression symptoms were associated with higher positive mental health, social support, satisfaction with life, and resilience (Bibi et al., 2020). In a sample of Indian adults, the scale had a reliability of 0.85 (depression), 0.81 (anxiety), and 0.81 (stress; Sharma et al., 2020).

Results

The 16-item scale and corresponding subscales identified in the EFA were used for the confirmatory factor analysis. Models were analyzed using full informational maximum likelihood, which is a robust parameter estimation method for missing data. We tested four specific measurement models of the modified AARRSI: (a) a single-factor model with all items loading on one latent variable; (b) a three-factor model, in which the three factors were predicted by a

higher order racism-related stress factor; (c) a correlational model with all items loadings on their respective factors and correlated among each of the three latent factors; and (d) a bifactor model, in which items load both on their respective factors and a general factor. For each of the models, r^2 values for the items ranged from 0.15 to 0.49, 0.24 to 0.57, and 0.24 to 0.58 for a single factor, higher order, and correlational models, respectively. Fit indices show good model fit for the higher order model and correlational model, with the correlational model having slightly better fit than the higher order model (Table 2). Likelihood tests indicate significant differences between the higher order and correlational models. Therefore, the correlational model offers the best measurement fit for the modified AARRSI scale (Table 3). The bifactor model did not converge.

To further ascertain model fit, we also assessed the variance explained by each item in the correlational model and noted that two items, “You hear about a racially motivated murder of an Asian Indian person” and “Someone asks you if you are planning to go back to live in India,” explained less than .30 variance. The first item, “You hear about a racially motivated murder of an Asian Indian person,” despite explaining a small variance in the scale, is theoretically important in assessing racial stress for Asian Indians and was therefore retained in the scale. However, the second item, “Someone asks you if you are planning to go back to live in India,” likely is not a good fit for the scale as first-generation participants or immigrants on temporary visas may not consider this event to be a racially stressful event because of the nature of their visa status. Therefore, this item was deleted from the scale. Goodness-of-fit indices for the modified correlational scale showed a slightly better fit than the initial correlational model, $\chi^2(87) = 196.91, p < .001$, root-mean-square error of approximation (RMSEA) = 0.065 95% CI [0.053, 0.077], standardized root-mean-squared residual = 0.050, comparative fit index (CFI) = 0.94, Tucker–Lewis index = 0.93, Akaike’s information criterion = 13,753.50, Bayesian information criterion = 13,913.12. Specifically, we note the lower chi-square, Akaike’s information criterion, and Bayesian information criterion values as indicating a better fit for the modified correlational model with a 15-item measure versus the 16-item correlational model.

Measurement Invariance

The modified 15-item correlational scale was used to test for measurement invariance across generational status (first generation vs. second generation). Measurement invariance is tested using a set of analyses that assess increasingly restrictive levels of measurement invariance. Configural invariance (Model 1) involves specifying a

single baseline model across both groups. This model is a starting point to show the number of factors and corresponding items load similarly across both groups. Metric invariance (Model 2) involves adding factor loadings as constrained to be equal across both groups, that is, constrained lambdas. Scalar invariance (Model 3) involves adding constraints on item intercepts, that is, constrained phi matrices. Residual invariance (Model 4) involves adding constraints on residual variances, that is, constrained theta matrices. Several criteria were identified to assess for measurement invariance, likelihood ratio tests, change in CFI (Δ CFI), and change in RMSEA (Δ RMSEA). Specifically, larger Δ CFI and Δ RMSEA indicate a misfit between observed data and more restrictive model specification. The cutoff scores of Δ CFI less than or equal to $-.010$ paired with Δ RMSEA less than or equal to $.015$ were used (Chen, 2007; Cheung & Rensvold, 2002). Table 4 shows the fit indices for the four measurement invariance models. Increasing constraints on the model appear to decrease model fit. Using the cutoff criteria of Δ CFI less than or equal to $-.010$ paired with Δ RMSEA less than or equal to $.015$, the global fit indices suggest configural, metric, and scalar invariance. Table 5 shows the standardized β coefficients and variance explained by each item across the four models.

Construct Validity

The correlations between the three factors of the AARRSI scale, sociohistorical racism, general stereotype, and perpetual foreigner, were tested with other constructs (Table 6). All three factors had significant and high correlation with all three subscales of the SRE of recent and lifetime experiences, as well as appraisal, indicating convergent validity. Next, all three subscales had a significant but small positive correlation with the DASS and the PSS. Last, all three subscales were unrelated to cultural values of collectivism, recognition through family, and humility, indicating divergent validity. However, small negative correlations were found between values of conformity and emotional self-control and the three subscales of the AARRSI-AI.

Discussion

This study is the first of its kind to validate a measure of racism-related stress for Asian Indians in the United States. Specifically, we sought to validate an adapted version of the AARRSI for Asian Indians (Liang et al., 2004; Tummala-Narra et al., 2011). The study used both an EFA and a confirmatory factor analysis to identify and confirm the measurement model for the modified AARRSI-AI. The results support the utility of a 15-item AARRSI-AI with three

Table 2
Global Fit Indices

Model	χ^2			RMSEA		SRMR	CFI	TLI	AIC	BIC
	Value	df	p	Value	90% CI					
Single factor	415.05	104	.000	0.100	[0.090, 0.110]	0.071	0.83	0.81	14,800.16	14,977.78
Higher order	231.58	103	.000	0.065	[0.054, 0.076]	0.058	0.93	0.92	14,618.69	14,800.01
Correlational	224.69	101	.000	0.064	[0.053, 0.075]	0.051	0.93	0.92	14,615.80	14,804.52
Modified correlational	196.91	87	.000	0.065	[0.053, 0.077]	0.050	0.94	0.93	13,753.50	13,931.12

Note. RMSEA = root-mean-square error of approximation; 90% CI = 90% confidence interval; SRMR = standardized root-mean-squared residual; CFI = comparative fit index; TLI = Tucker–Lewis index; AIC = Akaike’s information criterion; BIC = Bayesian information criterion.

Table 3
Likelihood Tests

Nested model	χ^2	df	p
Single factor nested in higher order	183.47	1	.000
Single factor nested in correlational model	190.36	3	.000
Higher order nested in correlational model	6.89	2	.0319

subscales of sociohistorical racism, general stereotype, and perpetual foreigner as a measure of racism-related stress for Asian Indians. The EFA conducted for the AARRSI-AI in Tummala-Narra et al.'s (2011) article found no evidence for underlying factors. However, the findings of our study are consistent with the original AARRSI scale that found the same underlying factors (Liang et al., 2004). Specifically, the factor of sociohistorical racism measures experiences that are collective, intergenerational, vicarious, and chronic sources of racism stress. Next, perpetual foreigner racism measures experiences where Asian Indians are assumed to always be foreign to the United States. This form of racism is a unique experience that is distinct to Asian Americans compared to other racial and ethnic minorities (Liang et al., 2004). Last, general racism measures day-to-day experiences of racism. The correlational factor model supports that these factors are related to each other in explaining racism-related stress for this population.

Participants in this study had lower means for their scores on the SRE and AARRSI than previous populations measured (Landrine & Klonoff, 1996; Liang et al., 2004). The mean score for the SRE Recent, Lifetime, and Appraisal (1.61, 1.81, 1.97) falls between the statements, "This has never happened" and "This has happened to me once in a while (less than 10% of the time)" (Landrine & Klonoff, 1996). The mean score for AARRSI-AI (2.69, 2.06, 2.62) fell in between the statements "This event happened but did not bother me" and "This event happened and I was slightly bothered" (Liang et al., 2004). These scores likely indicate that AARRSI-AI's culturally specific items are better suited for this population. Next, these findings also indicate that Asian Indians may not be appraising and responding to racism in the same way as other racial-ethnic minorities might. Rather than Asian Indians experiencing lower frequency or intensity of racist experiences, we argue that this population interacts with such experiences in a unique manner. In previous research with 44 Indian Americans, participants shared themes of silence, avoidance, and minimization as it relates to race and racism (Tummala-Narra et al., 2024). Participants in this study also discussed complicated dynamics within the Indian American

community like stereotypes about Indians, the model minority myth, being perceived as a foreigner, and intracommunity bias against darker skin color, which may have led to confusion in their racial-ethnic identity (Tummala-Narra et al., 2024). Furthermore, Asian Indians may conflate race, ethnicity, and nationality, which further impacts confusion in racial-ethnic identity (Tummala-Narra et al., 2011). In another qualitative study with Asian Indian international students, participants had varying understandings of race and racism, with one participant sharing that Asian Indians are "closer to whiteness" than other minorities (Aggarwal, 2023). Bhatia (2007), in his ethnographic work, also wrote about how Indian American participants respond to racism by asserting sameness, their merit, and the universality of experiences. Taken together, Asian Indians in the United States may have differing salience of their racial-ethnic identity and subsequent appraisal of racism-related events compared to other racially minoritized populations, which may be evident in the lower means seen in this study. Overall, the results of this study indicate Asian Indians in the United States experience racism-related stress, and having culturally specific scales to measure these experiences allows for nuances in understanding racist experiences.

This study also found that AARRSI-AI is a valid measure to be used for first- and second-generation Asian Indians and functions the same across the two groups. As such, AARRSI can be used to compare the difference in racism-related stress for the two groups. This is a particularly important finding as prior research has found mixed results between first- and second-generation groups and their experience of racism (Kaduvettoor-Davidson & Inman, 2012; Tummala-Narra et al., 2011). Given our findings, AARRSI-AI may be beneficial in future research identifying other important contextual factors that may explain the prior mixed results and differences between first- and second-generation Asian Indians.

All three subscales of the AARRSI-AI had small and significant correlations with the PSS and DASS. Liang et al. (2004) conceptualized racism-related stress as a distinct stressor from general life stressors people experience, such as workplace conflict or rising grocery costs. While distinct, racism-related stress can have an additive effect on general life stress, thus explaining the small and significant correlation (Liang et al., 2004). We argued that racism-related stress may have similar impacts on anxiety and depression, such that stressful experiences with racism have an additive effect on overall scores on anxiety and depression.

Finally, we found that AARRSI-AI has divergent validity and is not associated with most cultural values on the AAVS-M, consistent with the results of the original AARRSI. Specifically, the values of collectivism, recognition through family, and humility are distinct

Table 4
Fit Indices for Measurement Invariance

Model	χ^2			RMSEA		Δ RMSEA	SRMR	CFI	Δ CFI	TLI	AIC	BIC
	Value	df	p	Value	90% CI							
1	305.50	174	.000	0.073	[0.059, 0.086]		0.065	0.916		0.899	12,953.91	13,194.97
2	315.92	186	.000	0.070	[0.057, 0.083]	−0.003	0.073	0.917	0.001	0.907	12,940.33	13,137.56
3	323.37	192	.000	0.069	[0.056, 0.082]	−0.001	0.084	0.917	0.000	0.909	12,935.78	13,111.10
4	390.67	207	.000	0.079	[0.067, 0.091]	0.010	0.097	0.883	−0.034	0.882	12,973.09	13,093.62

Note. RMSEA = root-mean-square error of approximation; 90% CI = 90% confidence interval; SRMR = standardized root-mean-squared residual; CFI = comparative fit index; TLI = Tucker-Lewis index; AIC = Akaike's information criterion; BIC = Bayesian information criterion.

Table 5*Standardized Coefficients and R² for Each Model*

Item and subscale	Model 1				Model 2				Model 3				Model 4			
	1st Gen.		2nd Gen.		1st Gen.		2nd Gen.		1st Gen.		2nd Gen.		1st Gen.		2nd Gen.	
	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²
Sociohistorical																
1	.72	.51	.67	.46	.72	.52	.66	.44	.72	.52	.66	.45	.70	.49	.70	.49
2	.69	.48	.73	.53	.69	.48	.72	.52	.69	.48	.72	.53	.71	.50	.71	.50
3	.70	.49	.78	.62	.72	.52	.77	.59	.72	.52	.77	.59	.74	.55	.74	.55
4	.44	.19	.53	.29	.48	.23	.46	.21	.48	.24	.47	.22	.48	.23	.48	.23
5	.66	.44	.51	.26	.64	.41	.56	.32	.64	.40	.57	.32	.59	.35	.59	.35
6	.66	.44	.66	.45	.64	.41	.69	.48	.64	.41	.69	.48	.66	.44	.66	.44
7	.68	.46	.58	.33	.66	.44	.60	.36	.66	.44	.61	.37	.64	.40	.64	.40
General																
1	.78	.61	.71	.51	.78	.78	.72	.52	.79	.63	.70	.49	.74	.55	.74	.55
2	.65	.42	.61	.37	.62	.62	.65	.42	.65	.41	.62	.39	.63	.40	.63	.40
3	.72	.52	.55	.31	.71	.71	.59	.35	.73	.53	.57	.32	.64	.40	.64	.40
4	.75	.55	.74	.54	.76	.76	.70	.49	.78	.61	.67	.45	.74	.54	.74	.54
5	.63	.40	.66	.46	.66	.66	.62	.38	.68	.46	.59	.35	.66	.55	.66	.43
Foreigner																
1	.58	.35	.77	.59	.63	.63	.73	.54	.67	.45	.67	.44	.68	.46	.68	.46
2	.67	.46	.63	.40	.63	.63	.67	.45	.69	.47	.61	.38	.65	.42	.65	.42
3	.71	.50	.75	.56	.70	.70	.76	.57	.75	.56	.70	.49	.73	.53	.73	.53

Note. Gen. = generation.

from racism-related stress. However, we found that the values of conformity and emotional self-control had small negative correlations with all AARRSI-AI subscales. Those who endorse higher levels of conformity (sample item, “conforming to norms provides order in the community”) and emotional self-control (sample item, “one should not express strong emotions”) may be less likely to appraise racism and subsequently experience the stress associated with it. It is also likely that cultural values of conformity and emotional self-control are a form of coping strategy that Asian Indians may use to manage racism-related stress. Other researchers have found that Asian values have a moderating effect on the relationship between race-related stress and well-being, particularly

when individuals experience lower levels of race-related stress (Iwamoto & Liu, 2010). Overall, the inclusion of culture-specific items in AARRSI-AI measures stress associated with racist events and not cultural values.

Limitations and Future Directions

One limitation of this study is that the original scale was developed in 2004, adapted for Asian Indians in 2011, and data collection for the present study occurred in 2019 (Liang et al., 2004; Tummala-Narra et al., 2011). Race is a social construction, and sociopolitical context impacts and changes experiences related to race (Delgado & Stefancic, 2017). South Asian, Asian Indian, and Indian American identities are dynamic and responsive to the U.S. racial and political context (Bhatia & Ram, 2009). What may hold true for racism-related experiences in 2004 may not be in 2011, 2019, or 2024. Particularly, in the present moment, where several Indian-origin American lawmakers and politicians are in the national and international spotlight, race and ethnicity may be more salient and, therefore, impact racism-related stress among Asian Indians. While it is paramount to have culturally specific measures, it is also important to update such measures and collect data from a variety of research methods. As such, future research may look at collecting data on the AARRSI-AI and test its temporal consistency across time. Prior qualitative studies have illustrated how Asian Indians experience racism, how they appraise these events, and its subsequent mental health impact (Inman et al., 2015; Tummala-Narra et al., 2024). Given the dearth of Asian-Indian-specific quantitative measures, future research may consider mixed method designs to strengthen the reliability and validity of these measures.

Additionally, though Asian Indians have several unique contextual factors that may influence their understanding and appraisal of racism (Inman et al., 2015; Tummala-Narra et al., 2024), future research may also consider the development of a pan-ethnic, South

Table 6*Correlation, Means, Standard Deviations, and α Reliabilities*

Scale	1	2	3	M (SD)	α
1. AARRSI-AI sociohistorical	—			2.69 (1.06)	.84
2. AARRSI-AI general	.58**	—		2.06 (0.93)	.82
3. AARRSI-AI foreigner	.58**	.63**	—	2.62 (1.03)	.73
SRE-recent	.58**	.57**	.54**	1.61 (0.75)	.94
SRE-lifetime	.59**	.61**	.57**	1.81 (0.86)	.95
SRE-appraisal	.64**	.60**	.60**	1.97 (1.05)	.94
DASS	.18**	.26**	.14*	1.79 (0.68)	.96
PSS	.19**	.21**	.14*	2.52 (0.72)	.89
AAVS-collectivism	-.06	.03	-.11	3.88 (1.01)	.82
AAVS-conformity	-.20**	-.19**	-.21**	3.52 (1.08)	.79
AAVS-self-control	-.35**	-.15*	-.26**	3.10 (1.10)	.84
AAVS-recognition	-.10	-.07	-.10	3.90 (1.21)	.92
AAVS-humility	-.09	-.07	-.08	3.81 (1.20)	.84

Note. AARRSI-AI = Asian American Racism-Related Stress Inventory–Asian Indian; SRE = Schedule of Racist Events; DASS = Depression Anxiety Stress Scale; PSS = Perceived Stress Scale; AAVS = Asian American Values Scale.

* $p < .05$. ** $p < .001$.

Asian, and Arab racism-related stress scale. Specifically, there are likely similarities in experiences between South, Southwest Asians, and Arab Americans given the similarity in racialization of these groups (Maira & Shihade, 2006). Another factor that has received less attention in the literature is the racial ambiguity of South Asians (Harpalani, 2013). Future research may consider how skin tone and phenotypic presentations moderate or mediate the experience of racism-related stress. Next, the intersection of gender and racism is another important area of attention. Given prior research findings that Asian Indian international women experience more racism-related stress than men, research studies could investigate what processes underlie these gender differences (Aggarwal & Çiftçi, 2021).

Practitioners working with Asian Indians should consider how the experiences of Asian Indians are similar and different to other ethnic and racial groups. Practitioners should be aware of the culture-specific racist experiences of Asian Indians and how they may impact the psychological outcomes of this group. Practitioners may also facilitate client's ability to identify their sources of stress and help clients name racism-related stress. Regarding education, findings from this study also indicate that literacy of racial and ethnic experiences may be an interesting area of research. Critical consciousness "describes how oppressed or marginalized people learn to critically analyze their social conditions and act to change them" (Watts et al., 2011, p. 44). Research has consistently shown that without critical consciousness, marginalized individuals may internalize the oppression they are facing. For example, in interviews with Asian Indian international students, they believed themselves to be the problem when they first experienced racism in the United States (Aggarwal, 2023). To empower this population to better appraise and respond to their experiences, researchers might focus on how Asian Indians develop critical consciousness around race, what factors lead to further salience of race, and what factors contribute to participation in racial activism.

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