Construct validation of a shortened version of the Everyday Discrimination Scale

The demographics of the U.S. are rapidly shifting. Although non-Hispanic Whites continue to make up the majority of the U.S. population (64%), representation of Latino (16%), African American (12%), and Asian American (5%) individuals is not insubstantial (U.S. Census Bureau, 2010). Disaggregating demographics by child and adolescent versus adult populations highlights the nuances of demographic changes in the United States. Whereas racial/ethnic minorities comprised 33% of the adult population in 2010, they comprised 46% of the child and adolescent population (i.e., under age 18; O'Hare, 2011), and non-Hispanic White children and adolescents are projected to be the numeric minority by 2020 (U.S. Census Bureau, 2014).

These shifts in population demographics in the United States are complicated by both ongoing challenges with race relations and the clear disparities that exist between African Americans and Latinos versus Whites across numerous facets of daily living and well-being. In a recent survey by the Pew Research Center (2015), half of respondents indicated that racism is "a big problem" in the United States, and almost 60% agreed that more needs to be done to achieve racial equality. Moreover, African Americans and Latinos were much less likely to endorse fair treatment in various public spaces (e.g., in dealings with police, in schools, and in stores and restaurants) than their White counterparts (Pew Research Center, 2013).

Racial/ethnic disparities also exist across numerous life course outcomes, including poorer educational performance and attainment, lower labor force participation, and higher rates of teenage pregnancy, arrests and incarceration, poverty, and morbidity and mortality for African Americans and Latinos compared with Whites (Kena et al., 2015; Peterson & Krivo, 2005; Pew Research Center, 2013; Snyder & Dillow, 2013; Ventura, Mathews, Hamilton, Sutton, & Abma, 2011). Relatedly, evidence persists for differential treatment across racial/ethnic groups in health care, employment, the judicial system, financial and consumer markets, and the housing sector (Bales & Piquero, 2012; Krivo & Kaufman, 2004; Mouw & Kalleberg, 2010; Pager & Shepherd, 2008; Smedley, Stith, & Nelson, 2009). Although much of these disparities are documented for African American and Latino versus White populations, Asian Americans also face disadvantages that leave them vulnerable to stigmatization and mistreatment. For example, Asian Americans are often labeled as "model minorities" who are expected as a group to excel, yet larger perpetual foreigner stereotypes also label Asian Americans as a monolithic "other" who are viewed as foreigners despite nativity status or generational family ties to the United States (Kim, 1999).

It is both within and because of this larger contextual backdrop that experiences of discrimination are critical to understand. Discrimination is "any behavior which denies individuals or groups of people equality of treatment which they may wish" (Stroebe & Insko, 1989, p. 50). Numerous measures exist to assess individuals' personal experiences with racial/ethnic discrimination (see Schmitt, Branscombe, Postmes, & Garcia, 2014, Benner et al., 2018 for reviews). The Everyday Discrimination Scale (EDS; Williams, Yu, Jackson, & Anderson, 1997) is one of the most commonly used measures with both adolescent and adult populations, as this nine-item scale has been used in a multitude of population- and community-

based studies. Given the extensive population health implications for racial/ethnic discrimination, it is imperative that population-based studies integrate measures of racial/ethnic discrimination; however, integrating a nine-item measure may not always be feasible in large-scale surveys where the number of questions that can be administered are limited due to time and space constraints. In these cases, a shortened version of the EDS measure would be advantageous. Indeed, the National Longitudinal Study of Adolescent to Adult Health (Add Health) survey has combined the first two items of the EDS (i.e., treated with lest respect and treated with least courtesy) into a single-item measure. Whether this results in a measure that exhibits similar construct, convergent, and discriminant validity as the full EDS scale remains unknown and is the central focus of this study.

The Current Study

Specifically, we drew on secondary data from two studies from the Collaborative Psychiatric Epidemiology Surveys—the National Survey of American Life (NSAL) and the National Latino and Asian American Study (NLAAS)—as well as data from Add Health to examine the construct validity as well as convergent and discriminant validity of a combined two-item discrimination measure as compared to the full nine-item EDS measure.

Method

Participants

The NSAL was conducted in 2001-03 in the U.S., and in total, 6,082 primarily Black Americans were surveyed. NLAAS was conducted between 2002 and 2003 and included 4,649 Latinx and Asian Americans. Finally, Add Health is a longitudinal study that began in the 1994-95 school year. In total, 20,745 individuals participated in the first wave, and in wave 4 (the wave used in the current study), there were a total of 15,701 participants. Our analytic sample for each study was limited to those participants who a) reported experiencing discriminatory treatment and b) attributed this mistreatment to race, skin color, or nativity. Using these criteria, our NSAL sample consisted of 2,935 participants aged 18-74 (98% African American, 2% White; 60% female), the National Latino and Asian American Study (NLAAS) consisted of 1,655 participants aged 18-74 (52% Latino, 48% Asian American; 50% Female), and the Add Health Study consisted of 453 participants aged 25-33(57% African American, 24% Latino, 7% Asian American, 13% White; 53% Female). The demographics for participants from each study is presented in Table 1.

Measures

The current study centers on the EDS measure to assess participants' experiences of racial/ethnic discrimination. We also included measures assessing a host of well-being indicators spanning mental and physical health that have commonly been associated with experiences of discrimination. In general, items drawn from NSAL and NLAAS are identical; we have identified parallel well-being measures in Add Health, although, in some cases, the phrasing of the item or the rating scale differ slightly. For the purpose of this expanded abstract, we provide exemplar questions from NSAL and NLAAS.

Perceived discrimination. In the NSAL and NLAAS datasets, perceived discrimination is measured using the Everyday Discrimination Scale (Williams et al., 1997), a nine-item measure in which respondents were asked to report how often they experienced unfair treatment (e.g. "You are treated with less courtesy than other people are") in their everyday life. The ratings scale ranged from 1 (*never*) to 6 (*experience discrimination almost every day*). We calculated a mean for the full scale and for the first two items (("You are treated with less courtesy than other people are" and "You are treated with less respect than other people are"); higher mean scores on the 9-item and 2-item composites indicated greater perceived discrimination. In the Add Health dataset, a single-item measure is used to assess perceived discrimination, which combines the first two items of the EDS scale ("In your day-to-day life, how often do you feel you have been treated with less respect or courtesy than other people?"). This one-item measure, which will be labeled as the 2-item combined scale, uses a rating scale ranging from 0 (*never*) to 3 (*often*). As noted above, in NSAL and NLAAS, if a participant endorsed experiencing any kind of discrimination, the participant was asked, "What would you say was the main reason for this/these experiences?" Only those individuals endorsing experiences of discrimination tied to race, skin color, or nativity were included in the current sample. For Add Health, in contrast, only participants who reported experiencing discrimination sometimes or often were asked: "What do you think was the main reason for these experiences?"

Psychological well-being. We included six aspects of psychological well-being. This included general anxiety ("Have you ever worried more than others about the same problems?"), chronic anxiety ("Did you ever have a period of time lasting one month or longer when you were anxious and worried most days?), depression ("How often in the past week have you felt depressed?"), anger ("Have you ever in your life had attacks of anger when you break things, hit someone, or threaten someone?"), irritability ("Have you ever had a period of time lasting several days or longer when most of the time you were very irritable?"), and general mental health ("How would you rate your overall mental health?").

Physical well-being. We included ten aspects of physical well-being. For substance use, participants were asked about their alcohol use ("How often do you drink alcohol?") and drinking frequency ("On days you drink, about how many drinks do you have?"). For marijuana use, participants were asked if they had ever used marijuana ("Have you ever smoked marijuana?") and their frequency of use ("How often do you use marijuana?"). Participants were asked to report on several health problems, indicating whether a doctor/health professional had identified problems in each: high blood pressure, diabetes, blood circulation problem, or heart trouble. We also calculated the proportion of health problems endorsed for each participant. Finally, participants also rated their general physical health ("How would you rate your overall physical health?").

Demographics. Participants answered questions about their gender, ethnicity, age, marital status, employment status, household income, and household size.

Analysis Plan

We conducted a series of analyses to assess the construct validity of the 2-item EDS measure. Analyses were conducted separately for the 9-item and 2-item measures in NSAL and NLAAS

unless otherwise noted; when appropriate, we also conducted analyses on the 2-item combined measure from Add Health. To examine construct validity, we first examined the item-total correlation of the 9-item scale as well as the correlations between the 9-item scale and 2-item scale and the items within the 2-item scale in both NLAAS and NSAL. We then conducted univariate analyses to examine whether responses to each measure varied by key demographics, including gender (independent samples t-tests), age (ANOVA; age categories were 18-23, 24-32, 33-50, 51-74), and race/ethnicity (ANOVA); for the race/ethnicity analyses, we combined the NSAL and NLAAS datasets. Next, to test for convergent and discriminant validity, we examined the correlations of the 9-item, 2-item, and 2-item combined scales with 16 different mental and physical health indicators. We used a threshold of +/-.10 to identify potentially meaningful differences in the correlations across the three scales. Lastly, we examined whether these correlations differed across key demographic characteristics (e.g., gender, age, race).

Results

Descriptive Statistics for the EDS Measure

In NSAL, the 9-item EDS scale had a mean of 2.54 (SD = .84) and a median of 2.44, with scores ranging from 1 to 6. The EDS scale was normally distributed (skewness = .96, kurtosis = 1.21). For the 2-item EDS scale, the mean (2.84, SD = 1.12), median (2.50), and range (1-6) were similar to those of the 9-item scale. Similar to the 9-item scale, the 2-item scale also had a normal distribution (skewness = .70, kurtosis = .51). In NLAAS, the 9-item EDS scale had a mean of 2.1 (SD =.73) and a median of 2.00, with scores ranging from 1.11 to 6. The 9-item EDS scale yielded some evidence of kurtosis (3.00) and but no evidence skewness (1.29). The 2-item EDS scale had a mean of 2.56 (SD =1.04) and a median of 2.50, with scores ranging from 1 to 6. Unlike the 9-item scale, the 2-item scale was normally distributed (skewness = .82, kurtosis = .71). In Add Health, the 2-item combined scale had a mean of 2.15 (SD = .36) and a median of 2.00, with scores ranging from 2 to 3. The 2-item combined measure yielded not strong evidence of skewness (1.92) or kurtosis (1.69).

Construct Validity of the 9-item and 2-item and 2-item Combines EDS Scales

The 9-item EDS scale had item-total correlations ranging from r = .55 to .71 in NSAL and r = .63 to .74 in NLAAS. The correlation between the two items comprising the 2-item measure was r = .69** for both NSAL and NLAAS. The correlations between the 9-item scale and the 2-item scale were r = .74 in both the NSAL and NLAAS datasets. In both datasets, the correlations between the 9-item and 2-item scales were similar for men (r = .76 and r = .74 for NSAL and NLAAS, respectively) and women (r = .73 and r = .75 NSAL and NLAAS, respectively) and for White (r = .68 for NSAL), African American (r = .74 for NSAL), Asian American (r = .72 for NLAAS), and Latinx participants (r = .76 for NLAAS).

We next examined mean-level differences in the scales (9-item, 2-item, 2-item combined) across key demographic indicators. Consistent with previous research, the independent samples t-test results suggested that women reported significantly lower levels of discrimination than did men in both the 9-item (t (2373.77) = 5.72, p < .001) and 2-item scales (t (2426.11) = 2.20, p < .05) in NSAL and for both the 9-item (t (1648.17) = 5.61, p < .001) and 2-item scales (t (1651.70) =

2.56, $p < .05$) in NLAAS. No gender difference emerged for the 2-item combined scale in Add Health (t (450.66) = 1.20, $p = .23$). In regard to participant age, in NLAAS, there were significant age differences for the 9-item scale (F (3, 1626) = 18.17, $p < .001$) and the 2-item scale (F (3, 1625) = 7.61, $p < .001$); the pattern of differences were consistent across the 9-item and 2-item scales, wherein older participants (51-74) reported significantly less discrimination than younger people (18-23, 24-32, 33-50). However, in NSAL, the 9-item scale (F (3, 2865) = 15.38, $p < .001$), but not the 2-item scale (F (3, 2861) = 1.87, $p = .13$), demonstrated age differences, and the pattern of results was identical to that observed in the NLAAS. Age analyses were not conducted for Add Health due to the restricted age of the study sample (ages 25-33). There were also significant race/ethnic differences for the 9-item scale (F (3, 4586) = 109.29, $p < .001$) and the 2-item scale (F (3, 4581) = 24.73, $p < .001$) in the merged NSAL and NLAAS dataset as well as the 2-item combined scale in Add Health (F (3, 449) = 3.00, $p < .05$). African Americans reported significantly higher levels of discrimination than Latinx and Asian American participants for both the 9-item and 2-item scales in the combined NSAL/NLAAS dataset, and Whites experienced significantly higher levels of discrimination than Latinx participants for the 2-item combined scale (but not the 9-item scale).

Convergent and Discriminant Validity of the 9-item and 2-item and 2-item Combines EDS Scales

Finally, we examined the convergent and discriminant validity of the 9-item, 2-item, and 2-item combined discrimination scales. Table 2 presents correlations of each of the three scales with 16 different indicators of psychological and physical well-being. The three EDS scales showed similar patterns of correlations with each of the psychological well-being indicators. Individuals reporting higher levels of discrimination tended to have higher levels of anxiety, depression, anger, and hostility. In addition, the three EDS scales showed generally similar relations with the measures of physical well-being, although some exceptions should be noted. The most notable difference was their correlations with ever using marijuana and frequency of marijuana use—the 2-item combined scale (Add Health) had weak and non-significant relations with these indicators, whereas both the 9-item and 2-item scales (NSAL, NLAAS) showed small but significant correlations. The other notable difference was in relation to high blood pressure. Specifically, the 2-item combined scale (Add Health) had small but significant correlation with high blood pressure; however, this correlation was weak and non-significant for the 2-item and 9-item scales in both NSAL and NLAAS.

To further explore the similarity of the 9-item and 2-item scales, we recomputed all correlations in Table 2 separately across gender (male versus female) and age groups (18-23, 24-32, 33-50, 51-74). The recomputed correlations of the 2-item and 9-item scales with the psychological and physical well-being outcomes correlated $r = .96$ for men and $r = .93$ for women in NSAL dataset and $r = .92$ for men and $r = .88$ for women in NLAAS dataset. The recomputed results across the 2-item and 9-item scale had correlations ranging from $r = .89$ to $r = .94$ across age groups in NSAL; these correlations ranged from $r = .85$ to $r = .86$ in NLAAS.

Discussion

In summary, the results provide support for the convergence among the 9-item, 2-item, and 2-item combined EDS scales. The 9-item and 2-item measures were highly correlated with each

other, and the three measures had similar relations to known correlates spanning psychological and physical well-being. Thus, the findings support the construct validity of both 2-item measure and 2-item combined measure.

Table 1. Demographic Characteristics of the Sample

	NSAL			NLAAS			ADD Health		
	N	*M(SD)*	%	*N*	*M (SD)*	%	*N*	*M (SD)*	%
Age	2,935	40.99 (14.68)		1,655	38.55 (13.62)		453	29.15 (1.79)	
Race/ethnicity									
African American/Black/ Afro-Caribbean	2,884		98.3				256		56.5
Latino				862		52.1	108		23.8
Asian American				793		47.9	30		6.6
White	51		1.7				59		13.0
Gender									
Female	1,748		59.6	820		49.5	211		53.4
Male	1,187		40.4	835		50.5	242		46.6
Employment status									
Employed	2,106		71.8	1,094		66.1	296		79.8
Unemployed	288		9.8	126		7.6	35		9.4
Out of the workforce	541		18.4	435		26.3	40		10.8
Education level									
Less than 12 years	617		21.0	395		23.9	53		11.7
12 years	1,007		34.3	349		21.1	72		15.9
13-15 years	754		25.7	418		25.3	212		46.8
16 or more years	557		19.0	493		29.8	116		25.6
Household income (in thousands)	2,935	25 - 30		1,655	30 - 40		418	30 - 40	

Note. Total sample for NSAL is *N* = 2,935. Total sample for NLAAS is *N* = 1,655. Total sample for Add Health is *N* =453 .

Table 2. Construct validity of 9 item and 2 item EDS scale in NLAAS, NSAL, and Add Health

	NLAAS		NSAL		Add Health
	9-item scale	2-item scale	9-item scale	2-item scale	2-item combined scale
Psychological Well-being					
Anxiety					
General anxiety	.12**	.11**	.16**	.11**	.10*
Chronic anxiety	.07*	.06*	.02	.01	--
Depression					
Depression	-.02	-.03	.16**	.09**	.16**
Hostility					
Anger	.21**	.13**	.19**	.09**	.14**
Irritability	.20**	.15**	.18**	.10**	.17**
General mental health	-.04	-.07**	-.08**	-.05*	--
Physical Well-being					
Substance Use					
Frequency of alcohol use	.06*	.01	.08**	.03	.14**
Average drinks per day	.16**	.08	.12**	.04	.10*
Ever used marijuana	**.23**	**.11**	.17**	.08**	.02
Frequency of marijuana use	**.23**	**.12**	.13**	.07**	-.02
Physical Health outcomes					
Cardiovascular outcomes					
High blood pressure	-.01	.00	-.03	-.02	.12*
Diabetes	-.04	-.05*	.00	-.01	-.02
Blood circulation	-.01	.00	.01	-.03	--
Heart trouble	-.01	.01	.04*	.03	.04
Proportion of indicators	-0.01	0.00	0.00	-0.01	--
General physical health rating	-.01	-.04	-.07**	-.03	.05

Note. *N*s ranged from 248 to 1,655 for NLAAS. *N*s ranged from 947 to 2,850 for NSAL. *N*s = 453 for Add Health. – indicates that a comparable measure was not available in Add Health.