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# Stigma Consciousness, Racial Microaggressions, and Sleep Disturbance Among Asian Americans

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Increasing evidence suggests that individual differences in the reporting of *microaggressions* or subtle forms of everyday discrimination increases risk for poor health, but data on within-person associations between microaggressions and behavioral health outcomes is limited. This study examines the association between daily racial microaggressions and sleep disturbance and assesses whether the association is moderated by stigma consciousness. Participants were 152 Asian American college freshmen (87 male, 65 female) recruited to participate in a 14-day diary study. Perceptions of race-based stigma consciousness, everyday racial microaggressions, and self-reported sleep duration and quality were measured by questionnaire. Multilevel analyses showed that reports of daily racial microaggressions were associated with poorer sleep quality and shorter sleep duration the following day. Higher levels of stigma consciousness predicted greater sleep difficulties. Finally, stigma consciousness moderated the within-person relation between microaggression and sleep. As participants' levels of stigma consciousness increased, so did their tendency to experience diminished sleep quality and shorter sleep on nights after they reported more racial microaggressions. These results remained robust after adjustments for age, gender, nativity, socioeconomic status, and individual differences in the average level of daily racial microaggressions reported. These results add to a growing literature on the effects of bias and unfair treatment reported by Asian Americans by demonstrating how and when such experiences may be particularly consequential for sleep.

**Keywords:** Asian American, discrimination, racial microaggressions, sleep, stigma consciousness

Very few studies have been conducted on the needs of Asian Americans. Until such data are available, and until minority-targeted federal and state programs are evaluated concerning service to Asian Americans, conclusions of neglect and exclusion remain observational and tentative. These charges, however, underscore the need for research. (U.S. Commission on Civil Rights, 1980, p. 20)

More than three decades have passed since the U.S. Commission on Civil Rights (1980) remarked on the paucity of empirical

data addressing the incidence and prevalence of discrimination directed toward Asian Americans.<sup>1</sup> Summarizing the state of psychological research, Young and Takeuchi (1998) noted that “current and past research on the psychology of Asian Americans provides limited mention, if at all, of the role of racism on Asian American mental health” (p. 428). Such observations accord with the longstanding sociocultural belief that Asian Americans are model minorities who face little in the form of racial barriers to upward mobility (cf. Peterson, 1966; Schmid & Nobbe, 1965; Wu, 2002). Increasingly, however, psychological research has challenged this assumption, demonstrating that Asian Americans experience considerable discrimination and unfair treatment (Alvarez, Juang, & Liang, 2006; Sue, Bucceri, Lin, Nadal, & Torino, 2007; Wong & Halgin, 2006) and that these experiences have an adverse impact on both mental and physical health (Gee, Ro, Shariff-Marco, & Chae, 2009; Wang, Siy, & Cheryan, 2011; Yoo, Gee, & Takeuchi, 2009).

Growing empirical evidence from large-scale, population-based investigations (e.g., Gee, Spencer, Chen, & Takeuchi, 2007; Yip, Gee, & Takeuchi, 2008), community studies (e.g., Crawley, Ahn,

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<sup>1</sup> We use the term “Asian Americans” to refer to people with origins in East Asia, Southeast Asia, or the Indian subcontinent and who reside in the United States.

& Winkleby, 2008; Gee, 2002), and cross-sectional (Hwang & Goto, 2008; Lee, 2005; e.g., Liang, Li, & Kim, 2004) and longitudinal (e.g., Brown, Matthews, Bromberger, & Chang, 2006; Greene, Way, & Pahl, 2006) samples of Asian Americans indicate that discrimination is associated with increased risk for psychological morbidity and physical illness. Two recent summative reviews focused on the relationship between discrimination and health among Asian Americans. Specifically, in a systematic review of data involving Asian Americans, Gee et al. (2009) found a robust link between discrimination and mental health problems, an association that was found in 37 of the 40 studies reviewed. More recently, Paradies et al. (2015) examined data from 293 studies that focused on the relationship between discrimination and health across a range of ethnic/racial populations, national contexts and health outcomes. Meta-analyses indicated that racism was significantly related to poorer mental health, with the relationship being stronger for Asian Americans and Latino/a Americans compared with African Americans. Altogether, these studies present a challenge to the stereotype that Asian Americans represent a “model minority.”

### Racial Microaggressions and Mental Health

Beyond overt forms of racism-related stress, researchers argue that subtle forms of racial bias and discrimination are also important sources of stress for racial and ethnic minorities. Psychologists have used the term *racial microaggressions* to describe subtle forms of everyday bias and discrimination reported by members of historically marginalized groups (for a review, see Sue et al., 2007; Wong, Derthick, David, Saw, & Okazaki, 2014).<sup>2</sup> Further, researchers argue that racial microaggressions—especially microinvalidations (actions that nullify the experiential reality of racial minorities, such as regarding Asian Americans as perpetual foreigners) and microinsults (subtle behaviors or communication styles that debase or minimize an individual’s racial heritage, such as assuming that all Asian Americans are good at math and science)—are often ambiguous in nature (Sue, Bucceri, et al., 2007). Although empirical support for a taxonomy of microaggressions among Asian Americans has received scant research attention, findings from a measurement study by Nadal (2011) provide preliminary evidence that microinvalidations that involve themes of xenophobia or being treated as a “perpetual foreigner” (Liang et al., 2004) are the most common form of racial microaggression reported by Asian Americans. Similar findings have emerged from laboratory investigations (e.g., Cheryan & Monin, 2005) and content analyses of qualitative data (see Houshmand, Spanierman, & Tafarodi, 2014; Sue, Bucceri, et al., 2007).

To date, only a few studies have examined racial microaggressions as a risk factor for mental health problems among Asian Americans. In a study of 113 Asian American adolescents, racial microaggressions were associated with more depressive and somatic symptoms (Huynh, 2012). More recently, a study of 157 Asian American adults (ages 17–60 years) found that racial microaggressions predicted a range of mental health problems including anxiety, depression, and behavioral inhibition (Nadal, Wong, Sriken, Griffin, & Fujii-Doe, 2015). Despite growing scholarly interest, the vast majority of studies regarding racial microaggressions are cross-sectional, making it difficult to assess whether microaggressions influence mental health or vice versa

(for a discussion, see Ong & Burrow, in press). Ong, Burrow, Fuller-Rowell, Ja, and Sue (2013) reported bidirectional associations between daily racial microaggressions and negative affect in a microlongitudinal investigation of Asian Americans. In a study examining the within-person associations between race-based appraisals of microaggressions and emotions among Asian Americans, Wang, Leu, and Shoda (2011) found that everyday slights and insults not associated with race tended to have far less harmful impact than those which were race related.

### Perceived Discrimination, Stigma Consciousness, and Sleep

Several researchers have suggested that suboptimal sleep may represent a pathway through which perceived discrimination affects physical health (Hale & Do, 2007; Slopen & Williams, 2014; Tomfohr, Pung, Edwards, & Dimsdale, 2012). Chronic deficits in fundamental aspects of sleep—including sleep efficiency (i.e., initiating and maintaining sleep) and sleep quality (i.e., feeling rested and restored upon waking)—can have profound health effects that contribute to increased risks for central adiposity (Lewis, Kravitz, Janssen, & Powell, 2011), obesity (Knutson & Van Cauter, 2008), diabetes (Cappuccio, D’Elia, Strazzullo, & Miller, 2010), hypertension (Gottlieb et al., 2006), heart disease (Phillips & Mannino, 2007), and mortality (Li et al., 2014). Importantly, a recent systematic review of data from 17 studies found consistent evidence that discrimination was associated with poorer sleep outcomes (Slopen, Lewis, & Williams, 2016).

In addition to actual exposure to discrimination, evidence suggests that individual differences in *stigma consciousness* or the extent to which one expects to be stereotyped by others is associated with poor mental and psychological health outcomes (Pinel, 1999). Racial minorities who are high in stigma consciousness tend to perceive greater discrimination against themselves and members of their group (Pinel, 1999) and are more vigilant to race-related threats (Major & O’Brien, 2005). As a result, highly stigma conscious minorities tend to report increased psychological distress, greater susceptibility to stereotype threat, and lower self-esteem (R. P. Brown & Lee, 2005; Pinel, Warner, & Chua, 2005), especially in the context of ambiguous discrimination (Wang, Stroebe, & Dovidio, 2012). With respect to Asian Americans in particular, stigma consciousness is associated with greater anxiety, a desire to avoid intergroup interactions, and a general distrust in people (Pinel, 1999; Son & Shelton, 2011). These findings are in line with research showing that a high level of perceived stigma leads racial minorities to be more sensitive to race-based rejection and more likely to appraise stigma-relevant situations as threatening (Chan & Mendoza-Denton, 2008; Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002).

To date, very limited work has considered the association between race-based stigma consciousness and poor sleep. In what appears to be the only empirical investigation, 3,105 adults in Chicago rated their day-to-day racism-related vigilance (i.e., the extent to which they anticipated and prepared for racial discrimination) and overall sleep disturbance. Racism-related vigilance

<sup>2</sup> For cogent discussion of racial microaggressions from a critical race theory perspective, see Solórzano (1998); Solórzano, Ceja, and Yosso (2000), and Solórzano, Allen, and Carroll (2002).

was positively associated with sleep difficulty—and this association was similar across racial/ethnic groups (White, Black, Hispanic; Hicken, Lee, Ailshire, Burgard, & Williams, 2013). Although it is plausible to assume that this pattern of relationship might extend to other groups, we know of no studies that have directly investigated stigma consciousness and sleep among Asian Americans.

### Purpose of the Current Study

The current study aims to extend conceptual understanding of racial microaggression research in three important ways. First, we examined the effects of between-person variation in microaggressions and sleep, above and beyond shared variance with other demographic predictor variables, including gender (e.g., Capodilupo et al., 2010; Solórzano, 1998), socioeconomic status (e.g., Kessler, Mickelson, & Williams, 1999; Ong, Phinney, & Dennis, 2006), and nativity (e.g., Noh, Kaspar, & Wickrama, 2007; Yip et al., 2008). In line with prior cross-sectional research (Huynh, 2012; Huynh & Gillen-O'Neel, 2016; Nadal et al., 2015), we hypothesized that Asian Americans who experience more racial microaggressions on average would exhibit poorer sleep quality and shorter sleep durations. Second, we tested within-person relations between microaggressions and sleep disturbance. Extrapolating from previous research (Ong et al., 2013; Ong, Fuller-Rowell, & Burrow, 2009), we predicted that diminished sleep quality and shorter sleep would be reported on days with more racial microaggressions. Third, we examined how individual differences in stigma consciousness influenced the relationship between microaggressions and sleep. Given prior evidence of a link between vigilance for racial discrimination and poor sleep (Hicken et al., 2013), we hypothesized that heightened race-based stigma consciousness would predict greater sleep disturbance. Lastly, to the extent that stigma consciousness represents heightened sensitivity to subtle identity-threatening cues (Pinel, 1999; Son & Shelton, 2011), we hypothesized that Asian Americans high in stigma consciousness would be more vulnerable to poor sleep on days with more racial microaggressions.

### Method

#### Participants

These data are part of a larger study that investigated the relationships between racial microaggressions and well-being among Asian Americans (Ong et al., 2013). One hundred fifty-two Asian American college freshmen (87 males, 65 females) at a large university in the eastern United States were recruited to participate in a 14-day diary study of Asian/American experiences. The racial makeup of the sample was 38.9% White/non-Hispanic, 16.8% Asian American, 11.9% Hispanic/Latino, 6.9% Black/African American, 0.4% American Indian/Alaskan Native. Participants included 58.5% Chinese Americans, 13.2% Asian Indian, 7.9% Taiwanese, 5.9% Korean, 5.3% Vietnamese, 3.9% Filipino, 3.3% Japanese, and 1.9% "other Asian" (e.g., Cambodian, Hmong, Malaysian, etc.). The average age of the sample was 18.14 years ( $SD = .55$ , range = 16–20 years). The majority of the participants (56.6%) identified as second generation (first born in the United States), followed by 28.3% identifying as 1.5 generation (born in

Asia and came to the United States as a child or adolescent) and 8.6% as first generation (born in Asia and came to the United States as an adult). The sample self-reported a median family income between \$75,000 and \$99,999.

#### Procedure

Data for the study were collected via a secure website, and participants were told how to access the website and provide their responses. Prior to beginning the daily diary portion of the study, participants completed a baseline questionnaire that assessed individual differences in stigma consciousness and background characteristics. During daily data collection, participants received an e-mail message each day reminding them to access the diary measures. To minimize variation in reporting times, participants could only log on to the website between the hours of 7:00 p.m. and 12 midnight. For 14 consecutive days, participants recorded, in vivo, their daily life events, affect, and physical health. Participants were compensated up to \$40 for their time: \$2 dollar for each diary completed, with a \$12 bonus if they completed all 14 diaries.

#### Measures

**Racial microaggressions.** Participants provided frequency counts of the daily occurrence of 20 racial microaggressions (Ong et al., 2013). The checklist is based conceptually on Sue, Bucceri, et al.'s (2007) focus group analysis with Asian Americans. In their content analysis, Sue, Bucceri, et al. (2007) identified eight specific microaggression themes that reflect the Asian American experience: (a) alien in own land; (b) ascription of intelligence; (c) denial of racial reality; (d) exoticization of Asian American women; (e) invalidation of interethnic differences; (f) pathologizing of cultural values and communication styles; (g) second class citizenship; and (h) invisibility. Through in-depth focus group discussions, Ong et al. (2013) identified a subtheme involving "immasculinity of Asian American men." Instructions for the 20-item checklist were worded to refer to whether the event had occurred that day (e.g., "I overheard someone saying that all Asians look alike"; "I heard it suggested that Asians do not experience as much discrimination as other minorities"). A respondent was given a score of 1 if they had reported a microaggression event on a particular day and a score of 0 if they had not. Summary scores, based on the number of microaggressions occurring each day, were computed by summing responses across the 20 items (see Ong et al., 2013, for more details). Internal consistency reliability of the daily racial microaggression items was not computed because the experience of one microaggression does not necessarily increase the likelihood of another (see Bollen & Lennox, 1991). Instead, to estimate reliability, test-retest correlations were computed across weeks, yielding a week-to-week correlation of .71.

**Sleep disturbance.** Measures of sleep quality and duration were used to assess sleep disturbance during the previous night. Sleep quality was measured with 5 items (e.g., "How difficult was it for you to get to sleep last night"; "How deeply and well-rested did you feel upon awakening") using a five-point scale 1 (*poor*) to 5 (*very good*). Items were reverse-coded so that higher values represented better sleep quality. Within-person estimates of reliability were computed using three-level models in which items were nested within days, which were nested within participants

(Bryk & Raudenbush, 1992, pp. 191–196). Using this procedure, the estimated day-level reliability was .83 for the 5-item measure of sleep quality. Sleep duration was calculated as the difference between self-reported bedtime and waking time. This outcome was used as a continuous variable.

**Stigma consciousness.** To assess individuals' expectations of race-related prejudice and discrimination, the Stigma Consciousness Questionnaire for Race/Ethnicity (SCQ-R; Pinel, 1999) was used. For each of 10 statements, respondents provide their level of agreement on a Likert-type scale, from 1 (*strongly disagree*) to 7 (*strongly agree*). Sample items include: "I usually worry that my behaviors will be viewed as stereotypically Asian."; "Most White Americans have a problem viewing Asian Americans as equals". Items were reverse-coded and summed so that higher values indicated increased race-based stigma consciousness or vigilance for racial discrimination ( $\alpha = .89$ ).

**Demographic measures.** Gender, socioeconomic indicators (i.e., parental education level and household income), and nativity status (immigrant vs. U.S. born) were also assessed. Data on parental education was obtained at baseline, based on participants' reports of the highest level of education obtained by their parents. Participants responded using a 5-point scale, ranging from 1 (*less than high school*) to 5 (*post college degree*). A single index of parental education was obtained by averaging ratings provided for both mother and father. Household income was determined by participants reporting their parents' combined approximate annual income using a 7-point scale, ranging from 1 (*less than \$7,500*) to 7 (*over \$100,000*). A dichotomous variable was created to indicate whether the participant was "foreign born" or "U.S. born" (0 = *foreign born*, 1 = *U.S. born*).

## Analytic Strategy

Given the hierarchical data structure (days nested within person), the data were analyzed with a series of multilevel models (MLM; Bryk & Raudenbush, 1992). The flexibility of MLM provides a number of advantages. First, MLM is appropriate for diary data. In the current study, up to 14 daily observations were nested within each of 152 participants. Second, MLM does not require that all individuals be measured at all occasions. Data can be used from participants who entered the study after it began and from participants who have missing data for some occasions of the study. Third, in MLM, more reliable units of observation contribute more to the estimation of parameters than less reliable units, a process known as precision weighting (for a discussion, see Bryk & Raudenbush, 1992, pp. 32–57). Fourth, a multilevel-modeling approach allows for the simultaneous modeling of within- and between-person effects using maximum likelihood estimation. Level 1 or within-person analyses address the question of *when*. For example, when individuals experience racial microaggressions, do they also report poorer sleep quality? Level 2 or between-person analyses address the question of *who*. They take the following form: Do people who report more racial microaggressions on average also have more sleep disturbances? Finally, the major advantage of these models over traditional approaches to analyzing repeated measures data is that they do not require that the data set be disaggregated to the level of the individual (which violates the assumption of independence of observations) or that the data be

averaged across repeated observations (which would ignore the within-person variation).

To test our main hypotheses, a series of MLM equations were constructed to examine the associations between racial microaggressions and each of the measures of sleep disturbance. Given that our analyses used reports of daily racial microaggressions to predict sleep, the latter of which reported on the next day's diary after the night's sleep occurred, we omitted the first day report of the 14 reports because there was no prior-day information for that report. As an illustration, the basic level-1 model for sleep quality is presented below:

Level 1:

$$\text{Sleep Quality}_{ij} = b_{0j} + b_{1j}(\text{Racial Microaggressions}_{ij}) + r_{ij}, \quad (1)$$

where Sleep Quality<sub>ij</sub> is an estimate of nightly sleep quality;  $b_{0j}$ , the intercept, is the predicted mean day-to-day change in sleep quality;  $b_{1j}$  is a partial regression slopes representing the effect of number of daily racial microaggressions on nightly sleep quality; and  $r_{ij}$  is the day-level residual of person  $j$ 's score at time  $i$  from the overall predicted score.

The Level 2 equation was specified predicting between-person differences in the Level 1 intercepts and slopes. The equation for predicting the intercept can be written as follows:

Level 2:

$$\begin{aligned} b_{0j} = & \gamma_{00} + \gamma_{01}\text{Gender}_j + \gamma_{02}\text{Age}_j + \gamma_{03}\text{Nativity}_j + \gamma_{04}\text{Education}_j \\ & + \gamma_{05}\text{Income}_j + \gamma_{06}\text{Average Microaggressions}_j \\ & + \gamma_{07}\text{Stigma Consciousness}_j + u_{0j}, \end{aligned} \quad (2)$$

where person  $j$ 's Level 1 intercept ( $b_{0j}$ ) is predicted as a function of the grand mean ( $\gamma_{00}$ ), average level of racial microaggressions ( $\gamma_{04}$ ), and a random error component ( $u_{0j}$ ). A number of other predictors were also included in the Level 2 equation to adjust for associations with sleep quality. They included gender ( $\gamma_{01}$ ), age ( $\gamma_{02}$ ), nativity status ( $\gamma_{03}$ ), education ( $\gamma_{04}$ ), income ( $\gamma_{05}$ ), and average level of microaggressions ( $\gamma_{06}$ ), and stigma consciousness ( $\gamma_{07}$ ). A second set of Level-2 equations tested individual differences in slopes (i.e., relations between racial microaggressions and sleep quality):

Level 2:

$$\begin{aligned} b_{1j} = & \gamma_{10} + \gamma_{11}\text{Gender}_j + \gamma_{12}\text{Age}_j + \gamma_{13}\text{Nativity}_j + \gamma_{14}\text{Education}_j \\ & + \gamma_{15}\text{Income}_j + \gamma_{16}\text{Average Microaggressions}_j \\ & + \gamma_{17}\text{Stigma Consciousness}_j + u_{1j}, \end{aligned} \quad (3)$$

In this equation, the slope ( $b_{1j}$ ) represents the estimated daily relationship between racial microaggressions and sleep quality for each participant. The slope parameter is estimated as a function of gender ( $\gamma_{11}$ ), age ( $\gamma_{12}$ ), nativity status ( $\gamma_{13}$ ), education ( $\gamma_{14}$ ), income ( $\gamma_{15}$ ), average level of microaggressions ( $\gamma_{16}$ ) and stigma consciousness ( $\gamma_{17}$ ), respectively, and ( $u_{1j}$ ) is the person-specific deviation from the slope (i.e., random effect). All day-level (Level 1) predictors were centered on individuals' mean to eliminate the influence of parameter estimates of individual differences; and all person-level (Level 2) predictors were grand mean centered.

## Results

### Descriptive Statistics

There were 1,770 person-days with complete daily microaggressions and sleep data (83.3% of the total study days). The median number of days a participant contributed data was 13 ( $M = 11.6$  days,  $SD = 2.6$ , range = 4–14 days). Approximately 78% of participants reported at least one racial microaggression over the 2-week study period. On average, the occurrence of a microaggression (range = 0–18) was reported on 18% of the study days (i.e., approximately once per week). The mean total sleep time was 6.99 hours (standard error,  $SE = .09$ ) out of a range of 1 to 12 hours. The mean sleep quality was 3.34 ( $SE = .04$ ) within a range of 1 to 5. Finally, mean stigma consciousness score ( $M = 4.01$ ,  $SE = .09$ , range 1–7) in the current sample was comparable to those observed in previous studies utilizing samples of Asian American college students (Son & Shelton, 2011).

### Between- and Within-Person Relations Between Racial Microaggressions and Sleep

Using MLM procedures, the first set of analyses examined the between and within-person relations between racial microaggressions and sleep disturbance (quality and duration). Tables 1 and 2 show that maximum-likelihood parameter estimates and standard errors for all multilevel models, adjusted for the effects of person-level predictors (i.e., gender, age, nativity, socioeconomic status, stigma consciousness). As shown in Table 1, holding other predictors constant, participants who reported more racial microaggressions on average tended to report lower sleep quality,  $\gamma = -.09$ ,  $SE = .03$ ,  $p < .05$ . Contrary to predictions, there was no association between average racial microaggressions and sleep duration at the between person level,  $\gamma = -.01$ ,  $SE = .09$ , *ns*.

In contrast to the between-person results, analyses of day-to-day relations between variables revealed a different picture of the

racial microaggression experience. As shown in Table 1, sleep quality tended to be lower on nights following reports of more racial microaggressions,  $b = -.49$ ,  $SE = .12$ ,  $p < .001$ . Similarly, individuals slept significantly less on nights after they reported more microaggressions,  $b = -.63$ ,  $SE = .26$ ,  $p < .05$  (see Table 2). Examination of the residual variance components indicated that inclusion of daily racial microaggressions explained 29% of within-person variance in sleep quality and 24% of the within-person variance in sleep duration respectively.

### Stigma Consciousness as a Predictor of Daily Intercepts and Slopes

A third set of analyses examined whether stigma consciousness predicted daily levels of sleep quality and sleep duration. To guard against the possibility that significant effects might be due to differences in exposure across people, average number of racial microaggressions was included as a covariate. As predicted, individuals with higher stigma consciousness scores tended to report lower sleep quality on a typical day,  $\gamma = -.10$ ,  $SE = .05$ ,  $p < .05$ . After controlling for average level of racial microaggressions, however, stigma consciousness was not an independent predictor of sleep duration,  $\gamma = -.06$ ,  $SE = .08$ , *ns* (see Table 1). Additionally, in an analysis in which stigma consciousness was examined as a predictor of the Level 1 intercept in a model treating racial microaggressions as a dependent variable, stigma consciousness did not predict more racial microaggressions,  $\gamma = -.03$ ,  $SE = .02$ , *ns*.

Finally, we tested whether stigma consciousness moderated the within-person relations between a given day's racial microaggressions and sleep disturbance the following night. Evidence was found for an exacerbating effect of stigma consciousness. Specifically, stigma consciousness potentiated or strengthened the association between racial microaggressions and sleep quality ( $\gamma = -.20$ ,  $SE = .06$ ,  $p < .01$ ) and between racial microaggressions and sleep duration ( $\gamma = -.34$ ,  $SE = .15$ ,  $p < .05$ ), respectively. To aid in the interpretation, parameter values were gener-

Table 1  
Effects of Racial Microaggressions and Stigma Consciousness on Sleep Quality

Fixed effect	Coefficient	SE	t ratio	df	p
Average level of sleep quality, $b_0$					
Intercept, $\gamma_{00}$	3.459350	.086249	40.109	136	<.001
Gender, $\gamma_{01}$	-.137246	.095170	-1.442	136	.152
Age, $\gamma_{02}$	-.029199	.049945	-0.585	136	.560
Nativity, $\gamma_{03}$	-.084806	.095482	-0.888	136	.376
Education, $\gamma_{04}$	-.044280	.052828	-0.838	136	.403
Income, $\gamma_{05}$	.002445	.064144	0.038	136	.970
Average microaggressions, $\gamma_{06}$	-.093251	.032478	-2.023	136	.041
Stigma consciousness, $\gamma_{07}$	-.101145	.054014	-2.134	136	.044
Racial microaggressions slope, $b_1$					
Intercept, $\gamma_{10}$	-.494178	.124234	-3.978	136	<.001
Gender, $\gamma_{11}$	-.150735	.129978	-1.160	136	.248
Age, $\gamma_{12}$	.019819	.064213	0.309	136	.758
Nativity, $\gamma_{13}$	.083157	.133229	0.624	136	.534
Education, $\gamma_{14}$	.009485	.063985	0.148	136	.882
Income, $\gamma_{15}$	-.001048	.067610	-0.016	136	.988
Average microaggressions, $\gamma_{16}$	-.113614	.100763	-1.128	136	.262
Stigma consciousness, $\gamma_{17}$	-.197500	.062583	-3.156	136	.002

Note. Day (Level 1) predictors are group-mean centered and person-level (Level 2) predictors are grand mean centered.

Table 2  
*Effects of Racial Microaggressions and Stigma Consciousness on Sleep Duration*

Fixed effect	Coefficient	SE	<i>t</i> ratio	<i>df</i>	<i>p</i>
Average level of sleep quality, $b_0$					
Intercept, $\gamma_{00}$	7.030599	.145290	48.390	129	<.001
Gender, $\gamma_{01}$	.018122	.152474	0.119	129	.906
Age, $\gamma_{02}$	.155836	.065079	2.395	129	.018
Nativity, $\gamma_{03}$	-.086401	.151950	-0.569	129	.571
Education, $\gamma_{04}$	-.017742	.074903	-0.237	129	.813
Income, $\gamma_{05}$	.035700	.094393	0.378	129	.706
Average microaggressions, $\gamma_{06}$	-.005977	.091752	-0.065	129	.948
Stigma consciousness, $\gamma_{07}$	-.058917	.078163	-0.754	129	.452
Racial microaggressions slope, $b_1$					
Intercept, $\gamma_{10}$	-.631294	.261519	-2.414	129	.017
Gender, $\gamma_{11}$	.070917	.294914	0.240	129	.810
Age, $\gamma_{12}$	.225805	.123702	1.825	129	.070
Nativity, $\gamma_{13}$	.121162	.311015	0.390	129	.697
Education, $\gamma_{14}$	-.276043	.146602	-1.883	129	.062
Income, $\gamma_{15}$	.286231	.159114	1.799	129	.074
Average microaggressions, $\gamma_{16}$	-.349980	.297818	-1.175	129	.242
Stigma consciousness, $\gamma_{17}$	-.337522	.146824	-2.299	129	.023

*Note.* Day (Level 1) predictors are group-mean centered and person-level (Level 2) predictors are grand mean centered.

ated using values one standard deviation above and below the mean to represent high and low scores for racial microaggressions and stigma consciousness, respectively.<sup>3</sup> For individuals high in stigma consciousness, days with more racial microaggressions tended to be followed by nights with poorer sleep quality (see Figure 1) and significantly less sleep (see Figure 2). Taken together, these findings suggest that individuals who report high levels of stigma consciousness show differences in their reactivity (but not exposure) to daily racial microaggressions. Such findings are consistent a differential reactivity model (Bolger & Zuckerman, 1995), whereby high stigma conscious individuals react more strongly to the occurrence of daily racial microaggressions.

## Discussion

The present study extends understanding of racial microaggressions and sleep disturbance in several ways. First, our results are consistent with research on chronic discrimination and sleep. Prior cross-sectional research has shown an association between overt forms of racial discrimination and measures of sleep (Slopen et al., 2016; Slopen & Williams, 2014). Our results extend this literature by demonstrating that racial microaggressions, or subtle forms of everyday racial discrimination, also predict sleep outcomes. Notably, this study is among the few studies to examine Asian American's experiences of racial microaggressions in relation to sleep quality (see also, Huynh & Gillen-O'Neel, 2016). More generally, this study adds to a growing body of data suggesting that daily discrimination may impact mental health via its influence on sleep disturbance (Hale & Do, 2007; Steffen & Bowden, 2006; Tomfohr et al., 2012).

Second, our results extend prior between-person research (e.g., Grandner et al., 2012; Lewis et al., 2013) by providing ecologically valid evidence of within-person contingencies between racial microaggressions and sleep disturbance. Whereas most previous studies of discrimination and sleep have been able to conclude only that individuals who report more discrimination also experi-

ence poorer sleep, our daily process design and multilevel analytic strategy was able to capture racial microaggression experiences close to their real-time occurrence and thus provide reports that were relatively free of retrospection bias. Importantly, some findings, such as the impact of daily microaggressions on sleep quality and sleep duration the following night, afford insight into dynamic processes that could not have been detected with more traditional between-person approaches (Ong & Burrow, in press).

Finally, the present study provides some of the first evidence regarding how race-based stigma consciousness modulates perceptions of racial microaggressions and the salubrity of sleep in Asian Americans. The findings are consistent with a sensitization or "kindling" model (Monroe & Harkness, 2005) of discrimination whereby a prior history of repeated experiences of unfair treatment increases a person's vulnerability. Prior evidence supports a link between racism-related vigilance and sleep difficulty (e.g., Hicken et al., 2013). Our results extend this work by demonstrating that race-related stigma consciousness may magnify the effects of daily racial microaggressions on both sleep quality and duration. These findings argue against simple additive models of chronic stressors and daily hassles and suggest that it is the interaction of diathesis-stress factors that vary both between (i.e., stigma consciousness) and within individuals (i.e., microaggressions) that lead to poor sleep outcomes (cf. Bolger & Zuckerman, 1995; Zautra, Affleck, Tennen, Reich, & Davis, 2005).

## Implications for Clinical Practice With Asian Americans

An increasing body of evidence indicates that discrimination has an adverse impact on sleep quality and duration (Slopen et al., 2016). Limited research, however, has examined everyday dis-

<sup>3</sup> Significant interactions were probed using procedures described by Bauer and Curran (2005) and Preacher, Curran, and Bauer (2006).

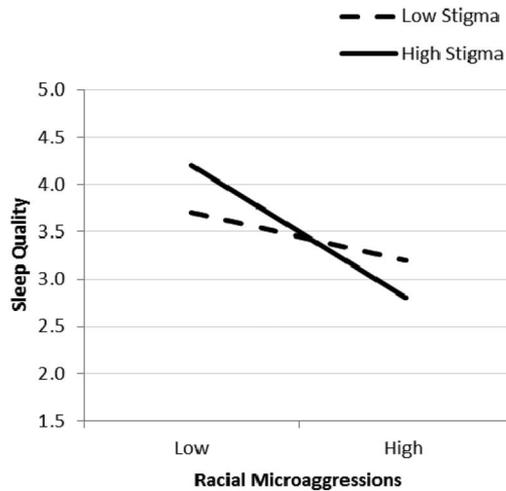


Figure 1. Association between daily racial microaggressions and sleep quality the following night as a function of stigma consciousness. High and low values are depicted as  $\pm 1$  *SD* from the mean.

crimination as a risk factor for sleep disturbance in samples of Asian Americans (Huynh & Gillen-O'Neel, 2016; Lewis et al., 2013) and most of the work to date is cross-sectional. Our results extend past research by examining the role of anticipatory stress or stigma consciousness as a moderator of day-to-day relationships between racial microaggressions and sleep. It is premature to apply our findings to a clinical context but they do have clinical implications that deserve brief mention. It is possible that implementing evidence-based behavioral treatments for sleep problems (e.g., relaxation and exercise; Irwin, Cole, & Nicassio, 2006) in individuals exhibiting heightened stigma consciousness might attenuate the impact of racial microaggressions on sleep disturbance and related health outcomes. Additionally, to the extent that race-based stigma consciousness facilitates collective action (Wang et al., 2012), future work that examines the interplay among Americans' perceptions of racial microaggressions and their everyday ecological contexts (e.g., peer relationships, school settings, neighborhood conditions) may help to distinguish among adaptive versus maladaptive responses to subtle forms of everyday bias.

In terms of clinical work with Asian Americans, findings from the current study illustrate the necessity for greater awareness concerning the frequency and impact of daily racial microaggressions. Given that racial microaggressions occur in the daily life of many Asian Americans (Huynh, 2012; Ong et al., 2013), they are also likely to occur in the transactions between Asian American clients and their helping professionals. For some Asian Americans, being able to talk about microaggression-related concerns may reduce potential rumination and intrusive thoughts surrounding ambiguous encounters of discrimination, facilitate problem-solving, and lessen internalization of negative societal stereotypes (Lewis, Derlega, Clarke, & Kuang, 2006). Whereas the use of explicit support (e.g., advice seeking, instrumental aid) may be an effective mode of coping with racial microaggressions for some, it is important to note that social support may be delivered implicitly, as when people are in the company of close others without being concerned about the relational consequences of explicitly seeking

support (Kim, Sherman, & Taylor, 2008). Indeed, indeed there is evidence that implicit support that does not bring relational risks is more sought out by and more beneficial for those from Asian cultural backgrounds (Kim, Sherman, Ko, & Taylor, 2006; Taylor, Welch, Kim, & Sherman, 2007). Therapists and mental health practitioners should recognize that racial microaggressions are a lifelong reality in the lives of Asian Americans. Moreover, the everyday experience of racial microaggressions is compounded by public beliefs that Asian Americans represent a model minority who are not exposed to or are somehow immune to the effects of racism or discrimination. Counselors who are not cognizant of this fact and interact with their Asian American clients may unintentionally communicate a denial of their racial reality.

### Limitations and Future Directions

Our conclusions are necessarily limited by some features of our methods and analyses.

First, our assessments of daily racial microaggressions—although empirically grounded in the experiential reality of Asian Americans (cf. Ong et al., 2013; Sue, Bucceri, et al., 2007)—relied exclusively on self-reports. These measures were completed at the end of the day, and hours could have passed since the occurrence of a racial microaggression. Because the occurrence of any life change requires some type of readjustment (Monroe & McQuaid, 1994), studies that go beyond consideration of subjective reactions to microaggressions to include coverage of physiological responses, biochemical assessments, and behavioral measures remain a high priority for future research (Lau & Williams, 2010). Beyond the measurement of microaggressions, the measurement of sleep is also an issue for the current study. Notably, this study used self-reported assessments of sleep quality and sleep duration. Contrary to prediction, in the fully adjusted Level 2 model, between-person variation in microaggressions was associated with sleep quality but not duration. Validation studies indicate that individuals tend to overestimate sleep duration (Lauderdale, Knutson, Yan, Liu, & Rathouz, 2008). Thus, until our

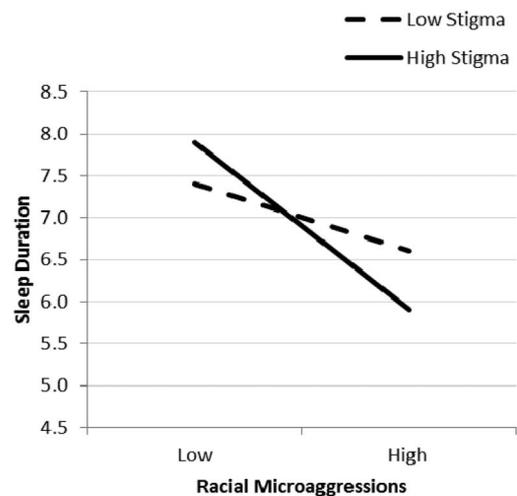


Figure 2. Association between daily racial microaggressions and sleep duration the following night as a function of stigma consciousness. High and low values are depicted as  $\pm 1$  *SD* from the mean.

findings are replicated using objective sleep measures, they should be interpreted with caution.

Our use of a daily events checklist of racial microaggressions raises another methodological concern. As Lazarus and Folkman (1984) have cogently argued, measuring life events without accounting for subjective appraisals assumes that certain situations are normatively stressful (see also, Tennen & Affleck, 2002). Although our findings highlight the possibility that effects of racial microaggressions on sleep are more readily amplified by the constricted attention associated with cognitions around the threat of discrimination, future research measuring such cognitions in vivo is needed to further test this prediction. Further, future work that examines the extent to which measures of daily racial microaggressions contribute predictive information above and beyond measures of daily nonracial events would greatly clarify questions concerning the incremental validity of microaggression measures (Hoggard, Byrd, & Sellers, 2012).

Finally, research regarding stigma consciousness, microaggressions, and sleep would benefit from prospective studies. As we did not embed our daily process study into a fully prospective design (e.g., Parrish, Cohen, & Laurenceau, 2011), we cannot distinguish whether sleep deficits that emerged among high stigma consciousness individuals represent a manifestation of preexisting vulnerabilities or whether they are consequences of chronic sleep disturbance. In addition to providing a more rigorous assessment of mechanistic pathways, prospective, multiwave, longitudinal-burst studies are critically important in advancing the science of racial microaggressions and sleep because they (a) allow for tests of theoretical models that assume stability of relations over time; (b) help address questions regarding duration of microaggressions and whether repeated microaggression exposure over time is associated with sleep disturbance above and beyond a single report; and (c) provide evidence against reverse-causality arguments, which posit that individuals who are sleep impaired may also report more microaggressions. Beyond addressing questions about the causal direction of effects, future research should also examine the mechanisms by which discrimination-related stigma consciousness might play a role in the exacerbation of negative states that are theorized to accompany racial microaggressions. Prior reviews of the literature (Slopen et al., 2016; Williams & Mohammed, 2009) suggest a number of candidate mechanisms. These include psychological distress symptoms (e.g., anxiety, depression, anger), stress hormones and inflammatory markers (e.g., cortisol, interleukin-6), neurobiological processes (e.g., nocturnal heart rate variability, circadian function), and maladaptive coping (e.g., tobacco and alcohol use). These hypothesized mechanisms have yet to be empirically investigated, as is the question of whether the relationships observed in the current study are stronger for different Asian American subgroups compared with the group as a whole.

## Conclusion

These limitations notwithstanding, the present study's findings suggest that everyday racial microaggressions are an important determinant of the salubrity (quality and duration) of restorative sleep among Asian Americans. Further, the findings indicate that the observed effects vary as a function of individual differences in stigma consciousness related to the threat of racial discrimination. Overall, our study makes a unique contribution to the racial microaggression and sleep literature by demonstrating the value of daily process

approaches, in conjunction with multilevel analyses, in enhancing understanding of the person–environment transactions that characterize the everyday experience of Asian Americans.

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