

## The Roles of Superwoman Schema and Socioeconomic Status on Systemic Lupus Erythematosus Disease Activity among African American Women

The Superwoman Schema is a coping framework hypothesized to be common among African American women embedded in a historical and present-day context of discrimination and adversity in the United States (Woods-Giscombé, 2010; Woods-Giscombé, Robinson, Carthon, Devane-Johnson, & Corbie-Smith, 2016). Superwoman Schema is a form of effortful coping that reflects the unique challenges and experiences of African American women and includes the dimensions of 1) intense motivation to succeed, 2) the obligation to manifest strength, 3) obligation to help others even to the extent of postponement of self-care, and 4) obligation to suppress emotion or resist showing vulnerability. While endorsement of these attitudes may help African American women persist in the face of adversity, effortful coping may be deleterious for health (James, 1994). Other forms of effortful coping, such as John Henryism, have been linked to hypertension, high cholesterol, metabolic syndrome and depression among African Americans (Brody, Yu, Miller, Ehrlich, & Chen, 2018; James, Keenan, Strogatz, Browning, & Garrett, 1992; Wiist, & Flack, 1992). In addition, features of Superwoman Schema such as emotion suppression and obligation to manifest strength have been linked to substance use, higher blood pressure, psychological distress, depressed immunological functioning, and less use of mental health services (Ehrmin, 2002; Krieger, 1990; Petrie, Booth, & Pennebaker, 1998; Steffen, McNeilly, Anderson, & Sherwood, 2003; Woods-Giscombé, Lobel, Zimmer, Cené, & Corbie-Smith, 2015; Woods-Giscombé et al., 2016). This association may be due to individuals not receiving the support that they need. Individuals with lower socioeconomic status who engage in more effortful coping may be at particular risk for negative health outcomes because they lack enough resources to benefit from high effort as individuals with more socioeconomic resources (James, 1994; Bennett et al., 2004).

The purpose of the current study was to examine whether profiles of stress (i.e., socioeconomic resources) and coping (i.e., endorsement of superwoman schema) were related to disease activity in a sample of African American women with systemic lupus erythematosus (SLE). SLE is an important disease to examine in relation to how stress and coping strategies operate due to how stress is associated with inflammation. We hypothesized that profiles with high levels of Superwoman Schema beliefs but with low socioeconomic resources would have the most disease activity.

Our data comes from the Black Women's Experience Living with Lupus (BeWELL) study. BeWELL includes a large population-based sample of African American ( $N = 438$ ) women with a confirmed SLE diagnosis, living in metropolitan Atlanta from 2015-2017. SLE validation was based on criterion defined by the American College of Rheumatology (ACR), which includes the presence of at least four criteria, or three ACR criteria with a diagnosis of SLE by a board-certified rheumatologist (Hochberg, 1997). Participants were recruited from the larger Georgians Living with Lupus cohort which was comprised of validated SLE cases from numerous sources in the metropolitan Atlanta area, including the Georgia Lupus Registry, hospitals, health care providers, regional laboratories, community practices, and other databases. BeWELL represents a socioeconomically and clinically diverse sample, with SLE cases ranging from mild to severe. Data were collected by trained research assistants in-person at Emory University Medical School, or, for those unable to travel, through an in-home assessment. During the interview, adiposity assessments were measured objectively and self-reported and interviewer-assisted questionnaire data, including socio-demographic, psychosocial, and health-related, was collected

via computer-assisted technology. All protocol and procedures were approved by the Emory University Internal Review Board.

Latent profile analysis was conducted in MPlus (v. 7.4) with the Superwoman Schema subscales (Obligation to present an image of strength, obligation to suppress emotions/resist vulnerability; intense motivation to succeed, and obligation to help others; Woods-Giscombe, unpublished), income to poverty ratio, perceived financial strain, and education level as indicators. The AIC, BIC, ABIC, entropy, and LMR indices were examined to determine goodness of fit for 2, 3, 4, and 5 class solutions. For AIC, BIC, and BIC, lower values indicate a better fit. Entropy levels of over .8 are considered good fit. The LMR test examines whether a solution with  $k$  classes fits better than  $k-1$  classes. Based on the indices, a 3-class solution appeared to be the best fit with the highest entropy (.864) and a better fit than the 2-class solution (LMR  $p < .001$ ) with a 4 class solution not being a better fit according to the LMR test ( $p = .19$ ).

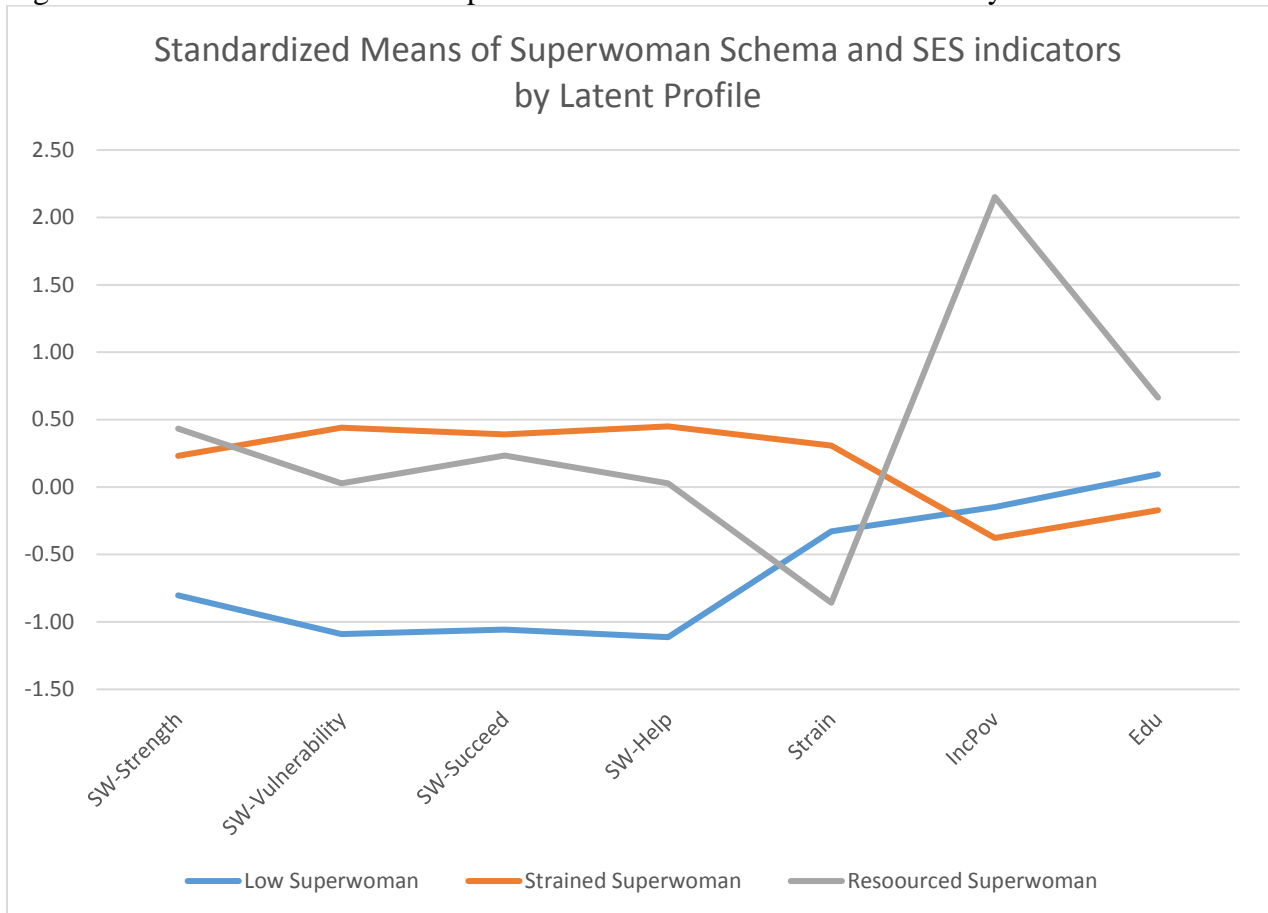
In the three profiles, the first profile (Low Superwoman) represented 25% ( $N = 111$ ) of the sample and had lower scores than average on all of the Superwoman Schema subscales (see Figure 1). The women in this profile were of moderate SES with mean education levels and slightly below the mean in income to poverty ratio and financial strain. The second profile (Strained Superwoman) represented 62% of the sample ( $N = 272$ ) and had the highest superwoman schema subscale scores, except for the strength subscale which was not significantly different from the 3rd profile. They also had the lowest SES of the sample with women reporting almost half a standard deviation above the mean in financial strain, almost half a standard deviation below the mean in their income to poverty ratio, and about .25 below the mean in education. The third profile (Resourced Superwoman) represented 13% of the sample ( $N = 55$ ). These women were similar to the Strained Superwomen in their Superwoman-Strength and Superwoman-Succeed scores but were lower than the Strained Superwomen in their obligation to resist vulnerability/emotion suppress and obligation to help others scores. They were significantly higher than the Low Superwoman profile in all scores. This group also was significantly higher than the other 2 groups in socioeconomic status, scoring over 2 standard deviations above the mean in their income to poverty ratio, almost 1 standard deviation below the mean in their perceived financial strain, and over half a standard deviation above the mean in their education levels. On other study variables there were other significant differences across the three profiles. Women in the Strained Superwoman group reported more SLE activity, were younger in age, and had more recent SLE diagnoses than the other groups. They also had higher BMI than the Low Superwoman group. The Resourced Superwoman group had the lowest SLE activity of the three groups before accounting for other demographic and disease characteristics.

ANCOVA analyses were conducted in STATA with SLE activity (acute disease activity or flares based on the presence of 24 items in the past three months, such as inflammation, joint pain and swelling, skin rashes, fatigue, oral rashes, and other symptoms of SLE) as the outcome variable. The latent profile groups were included as an independent variable with the Resourced Superwoman profile as the reference group were. Demographic variables (age, years since diagnosis, relationship status, working or not, and whether have private, public, or no insurance), and health status/behaviors [BMI, smoking history (never, former, current), medication use (steroid, antimalarial, immunosuppressant), and physical exercise] were included as covariates. After controlling for demographics and health status/behaviors, women in the Strained Superwoman profile still had significantly higher disease activity than the women in the Resourced Superwoman profile. Women in the Strained Superwoman profile also had higher disease activity than the women in the Low Superwoman profile ( $p = .04$ ). Women who engaged

in more physical activity, were employed, or used antimalarial medication had less disease activity. Women who were current smokers and used steroid medication had higher disease activity.

While there were limitations, this study contributes to the literature on Superwoman Schema and effortful coping more broadly. Previous studies on Superwoman Schema mostly used qualitative data. This quantitative analysis supports that Superwoman Schema is a coping framework that has important health implications for African American women. In addition, this study supports the multidimensional nature of Superwoman Schema. While two profiles were either high or low in the superwoman subscales, another profile was mixed, with high levels of obligation to present strength and motivation to succeed but average levels of emotion suppression and obligation to help others. The finding that two profiles with similar scores on presenting strength and motivation to succeed differed significantly in disease outcomes may suggest that interventions focusing on reducing emotion suppression and lack of self-care may be fruitful endeavors. In addition, women with lower socioeconomic resources may be more vulnerable to holding these attitudes that appear negative for physical health.

Figure 1. Standardized Means of Superwoman Schema and SES indicators by Latent Profile



Note: SW= Superwoman Schema

Table 1. One-Way ANOVA of continuous study variables by latent profiles.

	Low Superwoman	Strained Superwoman	Resourced Superwoman	F	p
SW strength	7.32 <sup>a</sup>	10.02 <sup>b</sup>	10.55 <sup>b</sup>	57.857	< .001
SW vulnerability	7.29 <sup>a</sup>	14.63 <sup>b</sup>	12.65 <sup>c</sup>	159.707	< .001
SW succeed	4.94 <sup>a</sup>	9.01 <sup>b</sup>	8.57 <sup>b</sup>	137.057	< .001
SW help	6.42 <sup>a</sup>	14.41 <sup>b</sup>	12.25 <sup>c</sup>	171.528	< .001
Financial Strain	6.14 <sup>a</sup>	8.95 <sup>b</sup>	3.8 <sup>c</sup>	47.498	< .001
Income-Poverty Ratio	1.75 <sup>a</sup>	1.37 <sup>b</sup>	5.61 <sup>c</sup>	463.202	< .001
Education	3.02 <sup>a</sup>	2.78 <sup>b</sup>	3.53 <sup>c</sup>	17.927	< .001
Damage	2.65	2.90	2.33	1.366	0.26
Activity	12.77 <sup>a</sup>	17.19 <sup>b</sup>	9.49 <sup>c</sup>	31.671	< .001
Age	48.75 <sup>a</sup>	45.29 <sup>b</sup>	50.59 <sup>a</sup>	6.171	0.002
Years Since Diagnosis	19.06 <sup>a</sup>	14.42 <sup>b</sup>	17.26 <sup>a,b</sup>	8.707	< .001
BMI	28.85 <sup>a</sup>	31.63 <sup>b</sup>	30.54 <sup>a,b</sup>	4.721	0.009
Physical Activity	3.06	2.9	3.2	2.206	0.11
N	111	272	55		

Notes: Groups that have significantly different means have different superscripts.

Table 2. ANCOVA analyses for SLE Disease Activity.

Variable	Disease Activity		
	B	SE	p
Low (vs Resourced)	1.99	1.00	0.05
Strained (vs Resourced)	<b>5.06</b>	<b>0.97</b>	<b>0.001</b>
Body Mass Index	0.05	0.04	0.26
Years Since Diagnosis	-0.02	0.03	0.56
Physical Activity	<b>0.80</b>	<b>0.35</b>	<b>0.02</b>
Partnered (v Single)	1.03	0.66	0.12
Employed (vs Unemployed)	<b>-3.52</b>	<b>0.72</b>	<b>0.001</b>
Current Smoker (vs Not Smoker)	<b>3.10</b>	<b>1.00</b>	<b>0.002</b>
Not insured (vs Insured)	-0.88	1.10	0.43
Steroid Medication	<b>2.53</b>	<b>0.69</b>	<b>0.001</b>
Antimalarial Medication	<b>-1.99</b>	<b>0.78</b>	<b>0.014</b>
Immunosuppressant	-0.52	0.72	0.49