

Longitudinal Associations Between Perceived Discrimination and Catecholamines

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Perceived discrimination (PD) has been associated with lower self-rated health, mortality, and aggregate indexes of physiologic dysregulation (Barnes et al., 2008; Fuller-Rowell, Evans, & Ong, 2012; Schulz et al., 2006). However, few studies have examined associations between PD and catecholamines, or hormones such as epinephrine (adrenaline) and norepinephrine, and even fewer have considered this association using longitudinal data. This is surprising given that over-activation of the sympathetic nervous system has been linked to chronic stress exposure and is thought to be an important mechanism for effects of PD on health (Ahmed, Mohammed, & Williams, 2007; Castro-Diehl et al., 2014).

Our study examined PD as a predictor of changes in urinary epinephrine and norepinephrine concentrations over a three-year period in a sample of college students at a large, predominantly white, midwestern university ($N = 149$, 45% Black, 55% White; mean age at baseline = 18.8, $SD = .96$). Two thirds of participants completed a follow-up assessment three years later. Epinephrine and norepinephrine concentrations were obtained from 12-hour overnight urine samples at both time points. PD ($\alpha = .91$) was assessed using 13 items from the Racism and Life Experiences Scales (RaLES; Harrell, 2000). Regression analyses examined the effect of PD on catecholamines at the follow-up time (three years later), adjusting for the initial catecholamine concentrations and other controls. An additional model further adjusted for depression, negative affect, and rejection sensitivity. Full Information Maximum Likelihood estimation was used to deal with missing data. The analytic sample was therefore $N=149$ across all models.

PD was associated with changes in norepinephrine ($B = .310$; $p = .008$) across the three-year period (Table 1). These effects remained after further adjusting for depression, negative affect, and rejection sensitivity. Analyses for epinephrine yielded the same pattern of findings. These results are consistent with previous studies showing that PD is associated with physiologic dysregulation and extends that work by establishing a longitudinal association with indicators of sympathetic nervous system activation. This research points to the importance of understanding social elements as risk factors for cardiovascular disease as well as understanding the full spectrum of social influences on health.

References:

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Statement of Research Advisor:

Lydia’s project is the first study to show that perceived discrimination is associated with longitudinal increases in urinary catecholamines, an important marker of sympathetic nervous system activation. I have no doubt that her innovative contributions will be published in a reputable journal and will become the basis for further important inquiry.

—Thomas E. Fuller-Rowell, Human Development and Family Studies

Table 1: Models 1-3 results showing race and racial discrimination as predictors of norepinephrine.

	Model 1		Model 2		Model 3	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	1.139*	.522	.509	.586	7.468**	2.262
Norepinephrine at T1	.394**	.099	.359**	.093	.407**	.098
Age	-.329**	.116	-.340**	.114	-.360**	.108
Sex (Female)	.094	.118	.036	.107	.018	.112
Race (Black)	.029	.093	-.140	.102	-.017	.166
Heavy Drinker	-.020	.095	-.046	.089	-.058	.094
Cigarette Smoker	.178	.137	.151	.115	.145	.110
BMI	-.081	.082	-.057	.077	-.086	.086
Income: Needs	.016	.115	.020	.108	-.016	.105
Perceived Discrimination			.310**	.117	.416**	.127
Depression					-.142	.098
Negative Affect					.077	.117
Rejection Sensitivity					-.221	.192

Note. All continuously coded predictor variables were standardized to have a mean of zero and *SD* of 1 in all models.