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Minority Stress and Psychological Adjustments Moderated by Stress Appraisals

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Introduction

- The beginning of the pandemic triggered a series of academic, structural, social, and personal stressors for students. Some students experienced abrupt closure of colleges and universities (Maiya et al., 2021; Magson et al., 2021), while others reported not having access to needed resources for remote online learning (i.e., internet connection; Yip, 2020).
- Furthermore, students reported undergoing stress about falling behind in class, the inability to socialize with their friends, participate in leisure activities, and the fear of a loved one becoming ill (Loon et al., 2021).
- Stressed experienced by students of color was exacerbated by their minority status. These compounded stressors may have a negative impact on underrepresented students' mental health which we know is already impacted by ethnic minority stress (Arbona & Jimenez, 2014; Ancis et al., 2000).

Hypotheses/Research Questions

- Challenge-focused stress appraisals (i.e., viewing stressful experiences as an opportunity) would moderate the associations between students of color achievement stress on self-esteem and academic sense of belonging.

Method

Participants and Procedures

- Undergraduate students (N = 192) completed an online survey and received course credit for their participation
- 78% women; *M*age = 21.90; *SD* = 4.49; 43.1% Latinx, 36.5% White, 9.1% Other, 5.1% African American, 4.1% Asian, and 2% Native American)

Measures

- **Minority Stress Scale (EMSS; Borden et al., 1993)**: 33-items assess students ethnic minority stress (e.g., *The university does not have enough professors of my race/ethnicity*); rated 0 (*does not apply*) to 5 (*extremely stressful*); α = .97.
- **Stress Appraisal Measure (Roesch & Rowley, 2005)**: 7-items subscale assess the beliefs, attitudes, and emotions related to experiences of stress across *challenge* appraisal (e.g., I can positively attack stressors); rated 0 (*not at all*) to 4 (*strongly agree*); α = .92.
- **School Connectedness**: 5-items assess perceptions of school connectedness (e.g., *I feel close to people at my school*); rated 1 (*strongly disagree*) to 5 (*strongly agree*); α = .77

Results

- Results showed that challenge stress appraisals significantly predicted higher self-esteem (β = .61; $p < .001$) and academic sense of belonging (β = .27; $p < .01$).
- Minority student achievement stress did not predict self-esteem (β = -.05; $p = .56$) or academic sense of belonging (β = -.09; $p = .31$).
- Challenge stress appraisals did not moderate the association between minority stress and self-esteem (β = -.05; $p = .54$) or academic sense of belonging (β = .08; $p = .39$).

Table 1.

Variables	1	2	3	4	Mean (SD)
1. Minority Stress - Achievement	--	-.21	-.14	-.10	1.30 (0.90)
2. Challenge Stress Appraisals	-.29*	--	.41**	.63**	3.38 (0.93)
3. Academic sense of belonging	.17	.25**	--	.23*	3.81 (0.66)
4.Self-esteem	-.38**	.61**	.47**	--	2.83 (0.55)
Mean (SD)	1.79 (1.60)	3.24 (0.93)	3.57 (0.68)	2.73 (0.55)	-

NOTE: top right hand corner non-SOC; lower left SOC

Discussion

- Preliminary analyses indicated that challenge stress appraisals did not moderate the association between minority stress and self esteem or academic sense of belonging; however, challenge stress appraisals was found to be a highly consistent predictor for higher self esteem and academic sense of belonging. Minority student achievement stress
- Further research needs to examine the specific stressors associated in relation to the COVID-19 pandemic which may have exceeded those stressors associated with ethnic minority status. Further analyses will examine if associations are different for students of color and White students.

Limitations and Future Directions

- This may warrant future research examining other factors (e.g., student ethnic/racial breakdown of the university, amount of interaction with faculty and students, whether a post-secondary institution is a minority serving institution) that influence and potentially explain this difference.
- The sample was non-representative and was collected during a historical period in our educational infrastructure.
- In the COVID-19 pandemic may have influenced a student's beliefs, attitudes, and emotions related to challenge appraisal stressors as needs and strategies are shifted to address immediately new overarching stressors.
- During this time, distanced learning (e.g., off-campus teaching and learning) may have impacted minority student achievement stress as the magnitude of these questions shift due to uncertainty and change into a virtual learning capacity.

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Variables	1	2	3	4	Mean (SD)
1. Minority Stress - Achievement	--	-.21	-.14	-.10	1.30 (0.90)
2. Challenge Stress Appraisals	-.29*	--	.41**	..63**	3.38 (0.93)
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Mean (SD)	1.79 (1.60)	3.24 (0.93)	3.57 (0.68)	2.73 (0.55)	-
NOTE: top right hand corner non-SOC; lower left SOC					

Table 2.
ran as is

	School Connectedness			Self-esteem		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Minority Achievement Stress	-.16	-.08	-.09	-.21*	-.05	-.04
Challenge Stress Appraisal		.28**	.27**		.61**	.61**
Interaction			.07			-.04
R^2	.03	.10	.10	.05	.39	.39
R^2 change	.03	.07*	.006	.05*	.34**	.002
Model F	3.12	6.40**	4.50**	5.68	37.04**	24.69**
Note: Standardized Betas reported. *$p < .05$, **$p < .01$						

Table 2.
with the soc_nonsoc variable

	School Connectedness				Self-esteem			
	Step 1	Step 2	Step 3	Step 4	Step 1	Step 2	Step 3	Step 4
Minority Achievement Stress	-.16	-.16	-.09	-.10	-.21*	-.22*	-.06	-.06
Soc_nonSoc		-.004	.02	.03		.01	.07	.07
Challenge Stress Appraisal			.28**	.27**			.61**	.62**
Interaction				.08				-.04
R^2	.03	.03	.10	.10	.05	.05	.39	.39
R^2 change	.03	.00	.07*	.01	.05*	.00	.34**	.29
Model F	3.12	1.55	4.26*	3.38*	5.68*	2.82	25.01**	18.72**
Note: Standardized Betas reported. *$p < .05$, **$p < .01$								

Table 2.
Depression and Self-esteem moderated

	Step 1
Acculturative stress	-.26**
School Connectedness	
Interaction	
R^2	.07
R^2 change	.07**
Model F	13.16**
Note: Standardized Betas reported. *p	

Table 2.
Depression and S

Minority Achievement stres
Challenge Stress Appraisal
Interaction
R^2
R^2 change
Model F
Note: Standardize

nonSOC	c_StressAppChallenge	Pearson Correlation	1	-.207	.625**	.410**	-.240*
		Sig. (2-tailed)		.088	<.001	<.001	.047
		N	82	69	82	82	69
	MinorityACHstress	Pearson Correlation	-.207	1	-.091	-.136	.317**
		Sig. (2-tailed)	.088		.457	.264	.008
		N	69	69	69	69	69
	rosenberg self-esteem score	Pearson Correlation	.625**	-.091	1	.227*	-.246*
		Sig. (2-tailed)	<.001	.457		.040	.041
		N	82	69	82	82	69
	school connectedness mean score	Pearson Correlation	.410**	-.136	.227*	1	-.065
		Sig. (2-tailed)	<.001	.264	.040		.596
		N	82	69	82	82	69
	minoritystress_appraisalchallenge	Pearson Correlation	-.240*	.317**	-.246*	-.065	1
		Sig. (2-tailed)	.047	.008	.041	.596	
		N	69	69	69	69	69
SOC	c_StressAppChallenge	Pearson Correlation	1	-.288*	.607**	.250**	.440**
		Sig. (2-tailed)		.038	<.001	.009	.001
		N	109	52	108	109	52
	MinorityACHstress	Pearson Correlation	-.288*	1	-.381**	-.173	-.129
		Sig. (2-tailed)	.038		.005	.219	.363
		N	52	52	52	52	52
	rosenberg self-esteem score	Pearson Correlation	.607**	-.381**	1	.468**	.336*
		Sig. (2-tailed)	<.001	.005		<.001	.015
		N	108	52	111	111	52
	school connectedness mean score	Pearson Correlation	.250**	-.173	.468**	1	.256
		Sig. (2-tailed)	.009	.219	<.001		.067
		N	109	52	111	112	52
	minoritystress_appraisalchallenge	Pearson Correlation	.440**	-.129	.336*	.256	1
		Sig. (2-tailed)	.001	.363	.015	.067	
		N	52	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	3.969	.104		38.160	<.001
	MinorityACHstress	-.102	.058	-.160	-1.767	.080
2	(Constant)	3.970	.109		36.584	<.001
	MinorityACHstress	-.101	.059	-.159	-1.701	.092
	SOC_nonSOC	-.006	.119	-.004	-.048	.962
3	(Constant)	3.207	.269		11.914	<.001
	MinorityACHstress	-.057	.059	-.089	-.961	.339
	SOC_nonSOC	.031	.116	.024	.267	.790
	StressAppChallenge	.201	.065	.282	3.075	.003
4	(Constant)	3.245	.273		11.892	<.001
	MinorityACHstress	-.063	.060	-.100	-1.060	.291
	SOC_nonSOC	.039	.116	.030	.333	.740
	StressAppChallenge	.196	.066	.275	2.980	.004
	minoritystress_appraisalchallenge	.055	.063	.078	.874	.384

a. Dependent Variable: school connectedness mean score

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.232	1	1.232	3.124	.080[b]
	Residual	46.941	119	.394		
	Total	48.173	120			
2	Regression	1.233	2	.617	1.550	.217[c]
	Residual	46.940	118	.398		
	Total	48.173	120			
3	Regression	4.743	3	1.581	4.259	.007[d]
	Residual	43.430	117	.371		
	Total	48.173	120			
4	Regression	5.027	4	1.257	3.379	.012[e]
	Residual	43.146	116	.372		
	Total	48.173	120			

a. Dependent Variable: school connectedness mean score

b. Predictors: (Constant), MinorityACHstress

c. Predictors: (Constant), MinorityACHstress, SOC_nonSOC

d. Predictors: (Constant), MinorityACHstress, SOC_nonSOC, StressAppChallenge

e. Predictors: (Constant), MinorityACHstress, SOC_nonSOC, StressAppChallenge, minoritystress_appraisalchallenge

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	Change Statistics: F Change	Change Statistics: df1	Change Statistics: df2
1	.160[a]	.026	.017	.62806	.026	3.124	1	119
2	.160[b]	.026	.009	.63071	.000	.002	1	118
3	.314[c]	.098	.075	.60926	.073	9.455	1	117
4	.323[d]	.104	.073	.60988	.006	.764	1	116

a. Predictors: (Constant), MinorityACHstress

b. Predictors: (Constant), MinorityACHstress, SOC_nonSOC

c. Predictors: (Constant), MinorityACHstress, SOC_nonSOC, StressAppChallenge

d. Predictors: (Constant), MinorityACHstress, SOC_nonSOC, StressAppChallenge, minoritystress_appraisalchallenge

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Table 2.
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	School Connectedness			Self-esteem		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Minority Achievement Stress	-.16	-.08	-.09	-.21*	-.05	-.04
Challenge Stress Appraisal		.28**	.27**		.61**	.61**
Interaction			.07			-.04
R^2	.03	.10	.10	.05	.39	.39
R^2 change	.03	.07*	.006	.05*	.34**	.002
Model F	3.12	6.40**	4.50**	5.68	37.04**	24.69**

Note: Standardized Betas reported. *$p < .05$, **$p < .01$

Table 2.
School connectedness as predicted by Minority Achievement Stress and Challenge Stress Appraisals

Variables	nonSOC (*n* =)			SOC (*n* =)			Entire Sample (*N* =)		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
SOC Status	–	–	–	–	–	–			
Minority stress	-.14	-.07	-.08	-.17	-.12	-.114			
Appraisal		.35**	.35**		.19	.11			
Interaction			.04			.19			
R^2	.02	.13	.14	.03	.06	.09			
R^2 change	.02	.12	.002	.03	.03	.03			
Model F	1.28	5.20**	3.46*	1.53	1.65	1.65			

Note: Standardized Betas reported. *$p < .05$, **$p < .01$

ble 2.
nority Achievement Stress and School Connectedness by Challenge Stress Appraisals

	nonSOC (n =)						SOC (n=)						Entire Sample (N=)					
	School Connectedness			Self-esteem			School Connectedness			Self-esteem			School Connectednes			Self-esteem		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
noritystress	-.14	-.07	-.08	-.07	.07	.10	-.17	-.12	-.114	-.41**	-.27*	-.27*						
praisal		.35**	.35**		.70**	.68**		.19	.11		.45**	.40**						
eraction			.04			-.10			.19			.11						
	.02	.13	.14	.005	.47**	.48	.03	.06	.09	.16	.35	.36						
change	.02	.12	.002	.005	.47**	.01	.03	.03	.03	.16*	.18**	.01						
del F	1.28	5.20**	3.46*	.32	30.19**	20.51**	1.53	1.65	1.65	9.65*	12.74**	8.67*						
e: Standardized Betas reported. *$p < .05$, **$p < .01$																		

Table 3.
Self-esteem as predicted by Minority Achievement Stress and Challenge Stress Appraisals

	nonSOC (*n* =)			SOC (*n* =)			Entire Sample (*N* =)		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
SOC Status	–	–	–	–	–	–			
Minority stress	-.07	.07	.10	-.41**	-.27*	-.27*			
Appraisal		.70**	.68**		.45**	.40**			
Interaction			-.10			.11			
R^2	.005	.47**	.48	.16	.35	.36			
R^2 change	.005	.47**	.01	.16*	.18**	.01			
Model F	.32	30.19**	20.51**	9.65*	12.74**	8.67*			

Note: Standardized Betas reported. *$p < .05$, **$p < .01$

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Introduction

- The beginning of the pandemic triggered a series of academic, structural, social, and personal stressors for students
  - inability to access needed resources for remote online learning (Yip, 2020) and socialize with their friends; fear of a loved one becoming ill (Loon et al., 2021)
- The stress appraisal(s) process follows a variety of stressors (i.e., primary: threat, challenging, or centrality) and the evaluation to cope with said stressors.
- For students of color, COVID related stress was exacerbated by their Minority status (MS). These compounded stressors may have a negative impact on underrepresented students' mental health which we know is already impacted by ethnic minority stress (Arbona & Jimenez, 2014; Ancis et al., 2000).

Hypotheses/Research Questions

- Challenge-focused stress appraisals (APP; i.e., viewing stressful experiences as an opportunity) would moderate the associations between students of color Achievement stress on Self-esteem and Academic sense of belonging.

Method

Participants and Procedures

- Undergraduate students (N = 192) completed an online survey and received course credit for their participation
- 78% women; Mage = 21.90; SD = 4.49; 43.1% Latinx, 36.5% White, 9.1% Other, 5.1% African American, 4.1% Asian, and 2% Native American)

Measures

- **Minority Stress Scale (EMSS; Borden et al., 1993)**: 6-item; rated 0 (*does not apply*) to 5 (*extremely stressful*); α = .97.
- **Stress Appraisal Measure (Roesch & Rowley, 2005)**: 7-items rated 0 (*not at all*) to 4 (*strongly agree*); α = .92.
- **School Connectedness**: 5-items rated 1 (*strongly disagree*) to 5 (*strongly agree*); α = .77.

Results

- For Students of Color (SOC), all bivariates were significant ($p < .01$) except for stress appraisal and minority stress ($p < .05$), school connectedness and minority stress, which was not significant (see Table 1).
- For non-SOC, all bivariates were significant at ($p < .01$) except for sense of belonging and self esteem ($p < .05$) and minority stress which was not significant with anything(see Table 1).

Table 1.
Descriptive Statistics and Bivariate Correlations for Study Variables (N = 192)

Variables	1	2	3	4	Mean (SD)
1. Minority Stress (MS)	--	-.21	-.14	-.10	1.30 (0.90)
2. Challenge Stress Appraisal (APP)	-.29*	--	.41**	.63**	3.38 (0.93)
3. School Connectedness (SC)	.17	.25**	--	.23*	3.81 (0.66)
4.Self-esteem	-.38**	.61**	.47**	--	2.83 (0.55)
Mean (SD)	1.79 (1.60)	3.24 (0.93)	3.57 (0.68)	2.73 (0.55)	-

NOTE: top right hand corner non-SOC; lower left SOC

Table 2.
School connectedness and Self-Esteem as predicted by Minority Achievement Stress and Challenge Stress Appraisals

Variables	School Connectedness			Self-esteem		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
SOC Status	.02	.03	.04	.07	.07	.08
MS	-.09	-.10	-.09	-.06	-.06	-.05
APP	.28**	.27**	.26**	.61***	.62***	.60***
MS X APP		.08	.09		-.04	-.04
SOC X MS APP			.06			.06
R^2	.10	.10	.11	.39	.39	.39
R^2 change	.07**	.01	.003	.34***	.002	.003
Model F	4.26**	3.38**	2.78*	25.01***	18.72***	15.02***

Note: Standardized Betas reported. *$p < .05$, **$p < .01$, ***$p < .001$

- Results showed that challenge stress appraisals significantly predicted higher self-esteem and school connectedness (see Table 2)..
- Minority student achievement stress did not predict self-esteem or school connectedness..
- Challenge stress appraisals did not moderate the association between minority stress and self-esteem or school connectedness.

Discussion

- Challenge stress appraisals did not moderate the association between minority stress and study outcomes, however, did predict the study outcome.
- Students who view stress as a challenge tend not to get discouraged as easily when faced with a predicament and being able to positively attack those stressors may positively influence their self-esteem and school connectedness.

Limitations and Future Directions

- The results cannot be generalized to communities outside of the university.
- Study did not control for COVID related stress.
- The study only focused on an aspect of ethnic minority stress, where as minority stress goes beyond just looking at culture and can be applied to other diverse identities *(e.g.*, gender, abilities, orientation) and the intersectionality of those identities. These individuals may experience disproportionate amounts of stress.
- COVID highlighted and exacerbated existing disparities among people of diverse identities and background. It could be that COVID related stress superseded the negative impact of minority stress.
- Future research should expand the study by evaluating other stress appraisal(s) (i.e., centrality or threat) that may yield more understanding on the SOC academic sense of belonging and self-esteem.

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