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Social Anxiety and Post-Event Processing: The Impact of Race

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Abstract

Background—Social anxiety is among the most prevalent psychiatric conditions, yet little attention has been paid to whether putative cognitive vulnerability factors related to social anxiety in predominantly White samples are related to social anxiety among historically underrepresented groups.

Design—We tested whether one such vulnerability factor, post-event processing (PEP; detailed review of social event that can increase state social anxiety) was related to social anxiety among African American (AA; $n=127$) persons, who comprise one of the largest underrepresented racial groups in the U.S. Secondly, we tested whether AA participants differed from non-Hispanic White participants ($n=127$) on PEP and social anxiety and whether race moderated the relation between PEP and social anxiety.

Method—Data were collected online among undergraduates.

Results—PEP was positively correlated with social anxiety among AA participants, even after controlling for depression and income, $pr=.30$, $p=.001$. AA and White participants did not differ on social anxiety or PEP, $\beta=-1.57$, 95% C.I.: -5.11 , 1.96 . The relation of PEP to social anxiety did not vary as a function of race, $\beta=0.00$, 95% C.I.: -0.02 , 0.02 .

Conclusions—PEP may be an important cognitive vulnerability factor related to social anxiety among AA persons suffering from social anxiety.

Keywords

social anxiety; social phobia; race; post-event processing

Introduction

Social anxiety disorder (SAD) affects 12.1% of the U.S. population, making it among the most common psychiatric disorders (Kessler et al., 2005). High rates of pathological social anxiety are particularly problematic given that social anxiety tends to be a chronic condition with low recovery rates and an early age of onset (Davidson, Hughes, George, & Blazer,

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¹A similar pattern was obtained when depression and income were not included as covariates.

1993). Individuals suffering from social anxiety often experience impairment in various functional domains such as employment or interpersonal relationships (Schneier et al., 1994; Stein, Torgrud, & Walker, 2000). Further, social anxiety is often related to other detrimental conditions including suicidal ideation, substance-related impairment, and depression (Buckner, Bernert, Cromer, Joiner, & Schmidt, 2008a; Buckner et al., 2008b; Davidson et al., 1993; Kessler et al., 1997; Sonntag, Wittchen, Höfler, Kessler, & Stein, 2000).

African American (AA) persons account for approximately 13% of the current American population and are considered one of the largest racial minority groups in the country (38.9 million people; Humes, Jones, & Ramirez, 2011). Recent reviews of the anxiety psychopathology literature have highlighted the importance of culturally influenced models of anxiety among African American adults (Hunter & Schmidt, 2010). Within the theoretical perspective proposed by Hunter and Schmidt (2010), pathological anxiety is influenced by sociocultural factors and behaviors (e.g., minority status/cultural mistrust, awareness of racism, stigma of mental illness). In fact, everyday experiences of discrimination are positively associated with pathological social anxiety among AA individuals (Levine et al., 2014). Yet, few empirical examinations of social anxiety among AA adults exist. Epidemiological data suggest that AA adults appear to be at lower risk for SAD relative to non-Hispanic/Latino White adults (e.g., Breslau et al., 2006; Grant et al., 2005). However, among college students, AA individuals do not appear to differ from White individuals in terms of severity of social anxiety (Hambrick et al., 2010). Yet, consistent with the notion that the experience of SAD varies based on various sociocultural factors (Hofmann, Asnaani, & Hinton, 2010), the role of social anxiety vulnerability factors may differ among AA and White undergraduates. In the only known published study of such factors, AA first-year undergraduates who had lower levels of sociability who were nervous meeting new people were particularly likely to have higher levels of anxiety during their college transition (Mounts, Valentiner, Anderson, & Boswell, 2006). This was not the case among White students. However, there remains much more to be known about the experience of social anxiety among AA persons.

Post-event processing (PEP) refers to a detailed review of one's performance following social events. PEP appears to play an important role in maintaining social anxiety, as individuals with elevated social anxiety engage in more negative PEP (for review see Brozovich & Heimberg, 2008), particularly after events characterized by negative evaluation (e.g., Lundh & Sperling, 2002). Negative PEP among socially anxious individuals does not appear to be a function of depressive rumination (e.g., Rachman, Grüter-Andrew, & Shafran, 2000) and socially anxious persons engage in more negative PEP than those with elevated trait anxiety, depression, or anxiety sensitivity (Fehm, Schneider, & Hoyer, 2007; Kocovski & Rector, 2007). Negative PEP is theorized to maintain and even exacerbate social anxiety by perpetuating negative impressions of oneself, negative memories of one's performance during social events, and negative assumptions of future social events (Brozovich & Heimberg, 2008).

A limitation of the PEP literature is that the vast majority of these studies have been conducted with predominantly White samples, with little attention to race. In fact, we know of no studies testing whether PEP is related to social anxiety among AA individuals. Yet, it

cannot be assumed that cognitive vulnerability factors related to social anxiety in one racial group are related to social anxiety in other racial groups. In fact, it is theorized that the sociocultural experience of AA persons impacts their experience of anxiety (Hunter & Schmidt, 2010). In the only known study of PEP's relation to social anxiety among a historically underrepresented racial group, PEP was differentially related to anxiety among Asian Canadians versus White Canadians (Kocovski & Rector, 2007). Specifically, among White Canadians, social anxiety and anxious rumination were significantly related to PEP engagement whereas among Asian Canadians, only social anxiety was significantly related to participants engaging in PEP.

Thus, the primary aim of the current study was to test whether PEP was related to social anxiety among African American persons, given that PEP is thought to be a risk and maintaining factor for pathological social anxiety (Brozovich & Heimberg, 2008). Also, given the dearth of research in this area, the current study had several secondary aims to further understanding of the experience of social anxiety among AA individuals in several ways. Specifically, we tested: (1) whether AA and White individuals differed on social anxiety to confirm previous reports of significantly lower levels of social anxiety among AA adults (Breslau et al., 2006; Gillis, Haaga, & Ford, 1995; Grant et al., 2005); (2) whether AA and White individuals differed on PEP. Given their greater exposure to at least one type negative evaluation (racial discrimination), it is possible that AA persons engage in more PEP, reviewing social events to determine what behaviors they may have engaged in that may have facilitated their being judged negatively; (3) whether PEP would be related to social anxiety among AA participants; and (4) whether race would moderate the relation of social anxiety to PEP such that White individuals with higher levels of PEP would report greater social anxiety in light of data that race moderated the relation of stereotype confirmation concerns and fear of negative evaluation (Johnson & Anderson, 2014), a core component of social anxiety. Specifically, Johnson and Anderson found that the relation between stereotype confirmation concerns and fear of negative evaluation was stronger among White individuals than AA individuals. They attribute this finding to the protective effects of racial socialization and racial identity within the AA community (Bynum, Burton, & Best, 2007; Neblett, Shelton, & Sellers, 2004). Thus, it may be that the relation between PEP and social anxiety is greater among White individuals than AA individuals if the protective impact of these social factors in the AA community also serves as a buffer against the effects of PEP.

Hypotheses were tested among college students given that the transition from high school to college is associated with increases in social anxiety (Spokas & Heimberg, 2009), suggesting that college may be a particularly vulnerable time in the course of social anxiety. Given the high rates of co-occurring social anxiety and depression (Grant et al., 2005), depression was included as a covariate to insure that observed effects were not due to depressive rumination.

Method

Participants

Participants were undergraduate students who were recruited through the Department of Psychology research participant pool at a large public university in the southern U.S. from January to October 2014 for a larger study on college substance use (e.g., Buckner & Terlecki, 2016). Substance use was not an inclusion criterion of that study. Of the 1,006 participants who completed the survey, data from 3 were discarded due to questionable validity (detailed below). Of the remaining participants, 127 (12.7%) self-identified as African American (AA) and 757 (75.5%) as non-Hispanic White. This is consistent with the racial composition of this university's psychology majors, in which 14.9% identified as AA and 73.5% as non-Hispanic White. Given the substantially unequal *ns* between these groups, a random selection of 127 of those identifying as non-Hispanic White was selected using the random sample of cases function in SPSS and included in the current study. Descriptive information by racial group is presented in Table 1.

Participants completed computerized self-report measures using a secure, on-line data collection website ([surveymonkey.com](https://www.surveymonkey.com)). Computerized versions of self-report measures have been found to produce scores that are highly correlated with paper-and-pencil versions (Gwaltney, Bartolomei, Colby, & Kahler, 2008). Participants received research credit for their psychology courses and referrals to university-affiliated psychological outpatient clinics for completion of the survey. All procedures were approved by the university's Institutional Review Board and informed written consent was provided prior to commencing the survey.

Measures

Social anxiety—The *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998) was used to assess social anxiety. The SIAS contains 20 items scored from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). It has demonstrated good internal consistency in both community and undergraduate samples and have been shown to be specific for social anxiety relative to other forms of anxiety (i.e., trait anxiety; Brown et al., 1997). An empirically supported cutoff score (34; see Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992) was used to identify those with clinically meaningful levels of social anxiety (Table 1). In a sample that was nearly 16% AA (Le Blanc et al., 2014), the SIAS demonstrated adequate diagnostic sensitivity and validity. Internal consistency of the SIAS was good-to-excellent in the current sample among AA ($\alpha = .89$) and White ($\alpha = .92$) participants.

Post-event processing—As in prior work (Battista & Kocovski, 2010), participants were first asked to think of a social event on the weekend per the *Social Event Questionnaire* (SEQ; Battista & Kocovski, 2010). Next, the *Post-event Processing Questionnaire* (PEPQ; Rachman et al., 2000) was used to assess PEP following the event described on the SEQ. Participants responded to 13 items related to anxiety and thoughts about the SEQ event on a scale ranging from 0 (*none*) to 100 (*very much*). Used with the SEQ, the PEPQ has achieved

good levels of internal consistency (Battista & Kocovski, 2010). Internal consistency of the PEPQ was good in the current sample among AA ($\alpha = .86$) and White ($\alpha = .89$) participants.

Depression—The depression subscale of the *Depression Anxiety Stress Scales (DASS-21)*; Lovibond & Lovibond, 1995) assessed frequency and severity of depression over the previous week using a 4-point scale. The DASS-21 scales has demonstrated adequate psychometric properties in other non-treatment seeking samples (see Henry & Crawford, 2005). Internal consistency was good in the current sample among AA ($\alpha = .82$) and White participants ($\alpha = .79$).

Response validity—To identify responders who provided random or grossly invalid responses, we included four questions from the *Infrequency Scale* (Chapman & Chapman, 1983). This includes items such as “I believe that most light bulbs are powered by electricity” and “I find that I often walk with a limp, which is the result of a skydiving accident”. As in prior online studies (e.g., Cohen, Iglesias, & Minor, 2009), individuals who endorsed three or more infrequency items ($n = 3$) were excluded from this study.

Results

Sample descriptives

As evidenced in Table 1, AA and White participants did not differ on age, gender, or percentage with clinically elevated social anxiety (AA $n = 17$, White $n = 16$). There was, however, a significant difference in estimated family income, with White participants reporting significantly greater income than AA participants. AA participants reported slightly more depression than White participants. Among AA participants, the type of social events participants reported attending included: house party (36.2%), bar/pub (30.7%), dinner party (14.2%), organized event (e.g., bridal shower or school-related function; 7.9%), concert (5.5%), and “other” (e.g., movies; 6.3%). Among White participants, the type of social events reported included: bar/pub (43.3%), house party (20.5%), organized event (15.0%), dinner party (11.0%), concert (3.9%), and “other” (6.3%).

Social Anxiety and PEP by Race

AA and White participants did not differ on level of social anxiety or PEP. Among AA participants, PEP was significantly, positively correlated with social anxiety, $r = .38$, $p < .001$. PEP was also significantly correlated with depression, $r = .26$, $p = .003$, but not with income, $r = .03$, $p = .759$. Partial correlations were conducted to test whether the relations observed between PEP and social anxiety remained after controlling for income and depression. PEP remained significantly related to social anxiety among AA participants, $pr = .30$, $p = .001$. PEP was also associated with significantly higher odds of having clinically elevated social anxiety after controlling for depression and income, $B = .004$, $SE = .001$, $OR = 1.00$, 95% CI = 1.00–1.01.

Moderation Analyses

We tested whether race moderated the relationship between PEP and social anxiety using hierarchical linear regression. Predictor variables were: Step 1: depression and family

income; and Step 2: race, PEP; and Step 3: the race $\times$ PEP interaction. PEP was centered and race was coded 0= *White*, 1= *AA*. This strategy ensured that effects at Step 3 cannot be attributed to variance shared with variables in Steps 1–2 (Cohen & Cohen, 1983). Using a statistical power analysis program (Faul, Erdfelder, Buchner, & Lang, 2009), it was determined that 68 participants would allow examination of this hypothesis at a power $> 80\%$ ($\beta < .20$) to test a moderate effect size with a Type 1 error (α) $< .05$. Thus, the current sample size of 258 was sufficient. As evidenced on Table 2, the main effect of PEP, but not race, was significantly related to social anxiety and the interaction was not significant. In other words, the relation between PEP and social anxiety did not vary as a function of race.

Discussion

This is the first known study to test whether a cognitive vulnerability factor that is posited to play etiological and maintaining roles in SAD (PEP; see Brozovich & Heimberg, 2008) is related to social anxiety among AA individuals. Findings contribute to the knowledge base regarding the experience of social anxiety among AA persons in several ways. First, findings replicate extant research (see Brozovich & Heimberg, 2008) as social anxiety was positively correlated with PEP. Second, current findings extend prior work by determining that PEP is significantly related to social anxiety among AA individuals, even after controlling for depression and income. Third, consistent with data suggesting similar levels of social anxiety among AA and White undergraduates (Hambrick et al., 2010), AA participants did not differ from White participants on level of social anxiety or on exhibiting clinically elevated social anxiety in the current sample. Fourth, AA and White participants did not differ on level of PEP and PEP's relation to social anxiety did not vary as a function of race.

Our findings support previous research and theoretical perspectives describing PEP as significantly positively associated with social anxiety (Brozovich & Heimberg, 2008; Fehm et al., 2007; Kocovski & Rector, 2007). However, given that the vast majority of past studies examining the relation between PEP and social anxiety have utilized samples predominantly composed of White participants, the findings of the current study provide a novel perspective in the social anxiety literature by determining that PEP is related to social anxiety among AA persons. However, sociocultural factors may impact the experience of PEP for AA persons (Hunter & Schmidt, 2010). To illustrate, discrimination is related to social anxiety among AA persons (Levine et al., 2014). Thus, although the current findings serve as an important first step in determining that PEP is related to social anxiety among AA persons, future work is necessary to determine whether AA and White persons differ in regards to factors that influence the engagement of PEP and/or whether AA and White persons differ regarding content of PEP.

Although not a primary aim of the current study, a few additional findings warrant comment. Consistent with the only known study of racial differences in social anxiety severity among college students (Hambrick et al., 2010) and some prior work with adolescents (e.g., Pina, Little, Wynne, & Beidel, 2014), AA participants did not differ from White participants on level of social anxiety. Yet, several studies utilizing adult samples have found lower rates of social anxiety among AA compared to White individuals (Breslau et al., 2006; Gillis et al., 1995; Grant et al., 2005; Himle, Baser, Taylor, Campbell, & Jackson, 2009). These

inconsistent findings may reflect that the relation of race to social anxiety is complex, influenced by sociocultural and demographic factors such as discrimination, change in racial identity/socialization over time, and age. Further, it may also be that current measures of social anxiety do not adequately assess the experience of social anxiety among AA persons (see Hambrick et al., 2010). Together, these inconsistent findings emphasize the importance of future work in the anxiety psychopathology literature focused on examining the experience of social anxiety among racially/ethnically diverse populations.

Findings have important clinical implications. First, given that PEP is related to social anxiety among AA persons, psychosocial interventions may benefit from explicitly assessing and targeting PEP among AA patients. Importantly, PEP reduces as a result of cognitive behavioral therapy (Abbott & Rapee, 2004; Rodebaugh, Jakatdar, Rosenberg, & Heimberg, 2009; Shikatani, Antony, Kuo, & Cassin, 2014). However, social anxiety symptoms appear to decrease at a slower rate among those with greater levels of PEP (Price & Anderson, 2011), suggesting that CBT may progress slower among AA patients who engage in more PEP. Second, identification of the AA clients' PEP content may assist the therapist in developing effective exposure exercises to teach adaptive strategies to cope with beliefs of perceived discrimination following a social event.

The present study should be considered in light of limitations that suggest avenues for future work in this area. First, the cross-sectional nature of the data limits our ability to draw conclusions regarding causal relations. Second, data were collected via self-report. Thus, future work could benefit from prospective and experimental designs. Third, the sample was comprised of self-referred, non-treatment seeking undergraduates. To generalize findings to those with SAD, we found that PEP was related to greater odds of having clinically elevated social anxiety. However, this finding should be interpreted with caution given the small number (17) of AA participants with clinically elevated social anxiety. Future work with larger numbers of AA persons with clinically elevated social anxiety is necessary to determine whether our results generalize to those with SAD as well as to treatment-seeking samples and to non-undergraduate samples. Fourth, although measures used in the current study demonstrated adequate internal consistency among AA participants, previous research indicates AA participants respond in patterns significantly different from White participants on the SIAS (Hambrick et al., 2010). Thus, further work may be necessary to develop and test the utility of measures designed to assess the specific social concerns of AA individuals. Fifth, although individuals self-identifying with other racial/ethnic groups completed the survey, their numbers were too small (e.g., 3.5% Asian, 4.2% White Hispanic) to test whether PEP was differentially related to social anxiety among these groups. Thus, future work comparing larger representation of these racial/ethnic groups will be an important next step in an effort to further identify cognitive vulnerability factors related to social anxiety among historically underrepresented individuals.

Despite these limitations, this is the first known study to test whether a cognitive vulnerability factor that is posited to play etiological and maintaining roles in social anxiety is related to social anxiety among AA individuals. In this case, PEP was related to social anxiety among AA persons. It is our hope that these findings will spur additional research testing the utility of factors believed to play etiological and maintain roles in social anxiety (e.g., Rapee &

Heimberg, 1997) generalize to African American persons as well as research testing sociocultural factors believed to play important roles in the experience of anxiety among African American persons (Hunter & Schmidt, 2010).

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Table 1

Descriptive information by race.

Variables	African American (<i>n</i> = 127)		Non-Hispanic White (<i>n</i> = 127)		<i>F</i> or χ^2	<i>d</i> or ϕ	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
1. Age	19.9	2.1	20.3	1.7	2.07	.18	.151
2. Family income	70,303	57,663	134,013	150,088	18.60	.56*	<.001
3. Gender (% female)	80.3		78.7		0.10	.02	.756
4. Social anxiety	19.86	11.86	19.63	12.33	0.02	.23	.881
5. Depression	5.97	7.05	4.50	5.33	3.49	.23	.063
6. Post-event processing	190.00	230.84	175.88	201.78	0.27	.07	.604
7. Clinically elevated social anxiety (%)	18.9		17.8		0.04	.01	.847

Note. Significant group differences are presented in bold.

Table 2

Hierarchical linear regression of the interaction of race X post-event processing (PEP) in the prediction of social anxiety.

	R^2	F	β	t	P	sr^2
Step 1	.269	42.40			<.001	
Depression			0.52	9.14	<.001	0.26
Income			−0.05	−0.88	.380	0.00
Step 2	.063	10.78			<.001	
PEP			0.24	4.41	<.001	0.06
Race			−0.08	−1.44	.152	0.01
Step 3	.000	0.15			.702	
Race × PEP			−0.03	−0.38	.702	0.00

Note. African American $n = 127$, non-Hispanic White $n = 127$. Race was coded 0 = *White*, 1 = *African American*; PEP = post-event processing; β = standardized beta coefficient.